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Walleri Reis

Brazil in Advancing Pharmacotherapy and Clinical Pharmacy in Latin America

Proceedings of the Fourth Brazilian Congress of Pharmacotherapy and Clinical Pharmacy

2024

SUPERVISÃO CLÍNICA

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DOI

doi: 10.62922/4cbffc
Permanent link: https://doi.org/10.62922/4cbffc

Dados Internacionais de Catalogação na Publicação (CIP)
(Câmara Brasileira do Livro, SP, Brasil)

Brazilian Congress of Pharmacotherapy and Clinical Pharmacy (4. : 2024 : Curitiba, PR)
Proceedings of the fourth Brazilian Congress of Pharmacotherapy and Clinical Pharmacy [livro eletrônico] : Brazil in advancing pharmacotherapy and clinical pharmacy in Latin America / editors Wallace Entringer Bottacin, Thaís Teles de Souza, Walleri Reis. -- 1. ed. -- Curitiba, PR : Supervisão Clínica - Treinamentos em Farmácia Clínica e Farmacoterapia, 2024.
PDF

Vários autores.
Vários colaboradores.
Bibliografia
ISBN 978-65-983944-2-4

1. Farmacoterapia - Congressos I. Bottacin, Wallace Entringer. II. Souza, Thaís Teles de. III. Reis, Walleri. IV. Título.

24-230565 CDD-615.58

Índices para catálogo sistemático:

1. Farmacoterapia : Congressos 615.58
Aline Graziele Benitez - Bibliotecária - CRB-1/3129

Preface

In the evolving landscape of healthcare across Latin America, the role of pharmacists continues to grow and transform. As we present this volume, "Brazil in Advancing Pharmacotherapy and Clinical Pharmacy in Latin America," we offer a window into the vibrant scientific and clinical pharmacy community that flourishes within our borders, while reaching outward to engage with our colleagues throughout the region.

This collection of works, emerging from the Fourth Brazilian Congress of Pharmacotherapy and Clinical Pharmacy, represents more than just a compilation of research and experiences. It embodies our commitment to advancing pharmaceutical care through shared knowledge and collaborative progress. While the contributions primarily showcase Brazilian expertise, they are presented with a broader vision: to serve as catalysts for dialogue, innovation, and advancement across Latin America.

From innovative clinical practices to groundbreaking research, each peer-reviewed work in this volume has been selected not only for its scientific merit but also for its potential to resonate beyond our national boundaries. As Brazil continues its journey in pharmaceutical sciences, we recognize that our progress is intimately connected with that of our Latin American neighbors. It is in this spirit of regional solidarity and shared purpose that we offer these proceedings.

To our readers—whether practitioners, researchers, educators, or students—we extend an invitation to engage with these pages not just as observers, but as participants in an ongoing dialogue. For in the end, the true measure of this work's success will be its ability to inspire, inform, and contribute to the advancement of pharmacotherapy and clinical pharmacy throughout Latin America.

The Editors,
Fourth Brazilian Congress of Pharmacotherapy and Clinical Pharmacy

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ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
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Supervisão Clínica is a leading organization dedicated to providing specialized training in clinical pharmacy and pharmacotherapy. With a commitment to advancing pharmaceutical education and practice, Supervisão Clínica offers a range of professional development programs aimed at enhancing the skills of pharmacists and healthcare professionals throughout Brazil. Their expertise in organizing educational events and workshops has significantly contributed to the growth and dissemination of knowledge in the field.

The Pharmaceutical Care Outpatient Clinic of the Federal University of Paraíba (UFPB) serves as a vital center for clinical practice, education, and research in pharmaceutical care. As part of UFPB, the clinic is instrumental in training future pharmacists and providing high-quality patient care. It plays a pivotal role in promoting evidence-based practices and fostering innovation in pharmacotherapy and clinical pharmacy within both academic and healthcare settings.

Together, these institutions have collaborated to organize the congress, uniting professionals, researchers, and students from across different locations. Their combined efforts aim to advance the field of pharmacotherapy and clinical pharmacy, addressing shared healthcare challenges and enhancing patient outcomes throughout the region.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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The proceedings of the Fourth Brazilian Congress of Pharmacotherapy and Clinical Pharmacy adhere to the highest ethical standards in research and publication. We are committed to promoting transparency, integrity, and accountability throughout the editorial and peer-review processes. All contributors are expected to uphold ethical guidelines, including the responsible conduct of research, proper attribution of sources, and avoidance of any form of plagiarism or data fabrication.

In line with the principles established by the **Committee on Publication Ethics (COPE**), we take any allegations of misconduct seriously. This includes issues such as plagiarism, falsification of data, and other unethical research practices. Any suspected misconduct will be thoroughly investigated, and appropriate actions will be taken to ensure compliance with ethical standards. Our commitment to ethical integrity is fundamental to maintaining the quality and credibility of the research presented in these proceedings and to fostering a culture of trust within the academic community.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Methodology for Selection of Works

The selection of works for inclusion in the proceedings of the Fourth Brazilian Congress of Pharmacotherapy and Clinical Pharmacy was conducted through a rigorous peer-review process designed to ensure the highest standards of scientific quality and relevance. Submissions were invited from the fields of Pharmacotherapy, Clinical Pharmacy, Pharmaceutical Care, Health Informatics, Evidence-Based Health, Public Health, and Integrative and Complementary Practices. Each submission underwent a double-blind review, where both the authors and reviewers remained anonymous, minimizing bias and enhancing the integrity of the review process.

The review criteria included methodological soundness, clinical relevance, originality, and adherence to ethical guidelines. We uphold the principles established by the **Committee on Publication Ethics (COPE)**, which emphasizes the importance of transparency, accountability, and ethical conduct in publishing. This commitment to COPE standards not only safeguards the integrity of the research but also fosters trust within the academic community.

Through this meticulous selection process, we aimed to compile a comprehensive collection of high-quality scientific investigations and clinical experience reports that reflect the advancements and innovations in the aforementioned areas, contributing to the ongoing discourse in pharmacotherapy and clinical pharmacy across Latin America.

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ISBN: 978-65-983944-2-4

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Surname Initials (of the authors), up to 6 authors, et al. if more than 6. Title of the abstract or experience report. In: Bottacin WE, Souza TT, Reis W, editors. Brazil in Advancing Pharmacotherapy and Clinical Pharmacy in Latin America: Proceedings of the Fourth Brazilian Congress of Pharmacotherapy and Clinical Pharmacy. Curitiba: Supervisão Clínica; 2024. p. [page range]. DOI: 10.62922/4cbffc.cpXXX

Citing the Entire Proceedings

Bottacin WE, Souza TT, Reis W, editors. Brazil in Advancing Pharmacotherapy and Clinical Pharmacy in Latin America: Proceedings of the Fourth Brazilian Congress of Pharmacotherapy and Clinical Pharmacy. Curitiba: Supervisão Clínica; 2024. DOI: 10.62922/4cbffc

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[Author Surname], [First Initial]. [Second Initial]., [Next Author Surname], [First Initial]. [Second Initial]., & [Last Author Surname], [First Initial]. [Second Initial]. (2024). [Title of abstract]. In W. E. Bottacin, T. T. Souza, & W. Reis (Eds.), Brazil in Advancing Pharmacotherapy and Clinical Pharmacy in Latin America: Proceedings of the Fourth Brazilian Congress of Pharmacotherapy and Clinical Pharmacy (pp. [page range]). Supervisão Clínica. https://doi.org/10.62922/4cbffc

MLA Style
[Author Surname], [First Name], et al. "[Title of Abstract]." Brazil in Advancing Pharmacotherapy and Clinical Pharmacy in Latin America: Proceedings of the Fourth Brazilian Congress of Pharmacotherapy and Clinical Pharmacy, edited by Wallace Entringer Bottacin, et al., Supervisão Clínica, 2024, pp. [page range]. DOI: 10.62922/4cbffc

ABNT Style
[Author Surname], [Author Initials]. Title of Abstract. In: BOTTACIN, W. E.; SOUZA, T. T.; REIS, W. C. T. (Eds.). Brazil in Advancing Pharmacotherapy and Clinical Pharmacy in Latin America: Proceedings of the Fourth Brazilian Congress of Pharmacotherapy and Clinical Pharmacy. Curitiba: Supervisão Clínica, 2024. p. [page range]. DOI: 10.62922/4cbffc

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

EDITORIAL

Science in Pharmacotherapy and Clinical Pharmacy in Brazil as Part of the Latin American Perspective

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About this editorial

DOI: 10.62922/4cbffc.cp001
Link: https://doi.org/10.62922/4cbffc.cp001
Type: Editorial.
Area: Pharmacotherapy and Clinical Pharmacy.
Received: 25/09/2024; Accepted: 26/09/2024; Published: 03/10/2024.

Background

The landscape of pharmacotherapy and clinical pharmacy in Latin America continues to evolve, with Brazil playing an integral role in this transformation. Over the past decade, our country has contributed significantly to the advancement of pharmaceutical sciences, the evolution of healthcare paradigms, and the growing recognition of pharmacists' role in patient care across the region. The Brazilian Congress of Pharmacotherapy and Clinical Pharmacy, now in its fourth edition, has emerged as a forum for sharing these contributions with our Latin American colleagues, fostering a collaborative environment for advancing pharmaceutical sciences and clinical practice throughout the region.

As part of Latin America's scientific community, Brazil has developed innovative approaches to pharmaceutical care that resonate with the challenges and opportunities faced by our neighboring

countries. Through digital transformation and collaborative platforms, we have enhanced our ability to share knowledge and experiences with colleagues across borders, enabling a rich exchange of ideas and practices that benefit the entire region.

As we present the Proceedings of our fourth congress, we offer a window into Brazil's ongoing contributions to Latin American pharmacy practice. This compilation showcases scientific works primarily from Brazilian researchers and practitioners, carefully selected for their potential to inform and inspire developments throughout Latin America. Our goal is to share experiences, methodologies, and innovations that can be adapted and applied across diverse healthcare contexts in the region.

A Testament to Scientific Rigor

This publication encompasses hundreds of scientific abstracts and experience reports, primarily from Brazilian institutions but selected for their relevance and applicability to the broader Latin American context. Our commitment to scientific excellence ensures that each contribution, while rooted in Brazilian experience, offers understandings and approaches valuable to practitioners throughout the region. Through our robust peer-review process, utilizing a double-blind system, we have evaluated submissions not only for their scientific merit but also for their potential to address challenges common across Latin American healthcare systems. The accepted works were assessed against multiple criteria including originality, methodological soundness, clinical relevance, and ethical compliance. This meticulous approach not only ensures the caliber of published works but also fosters the professional development of contributors through constructive feedback.

Commitment to Ethical Publishing Practices

As we continue to expand our international presence, we recognize the vital importance of progressively aligning our publishing practices with the principles outlined by the Committee on Publication Ethics (COPE) (1,2). Year by year, we are making significant strides toward full adherence to COPE standards, and we expect that by the 5th edition, we will meet all their criteria. Our commitment involves transparency by clearly communicating our editorial policies and review processes to all stakeholders; integrity by ensuring that all published works are free from plagiarism, data falsification, and other forms of research misconduct; and accountability by promptly and thoroughly addressing any ethical concerns to maintain trust within our community. Embracing these ethical guidelines requires collective effort, but we believe it is essential for fostering a community grounded in transparency, integrity, and accountability. By adhering to these standards, we aim to contribute positively to the global scientific dialogue and set a benchmark for excellence in our region.

Looking Ahead to the 5th Congress in 2025

Our vision for the upcoming fifth edition of the Congress is both ambitious and forward-thinking. We are committed to investing our utmost capacities to deliver superior scientific and experiential reports that not only reflect the current state of pharmacotherapy and clinical pharmacy but also drive innovation and improvement in the field. To achieve this, we are forging partnerships with international organizations to enhance cross-border knowledge exchange, thereby fostering enhanced international

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

collaboration. We are placing a stronger focus on impactful research by encouraging submissions that address pressing global health challenges and offer practical solutions. Additionally, we are expanding our educational offerings by introducing more workshops and seminars that cater to professionals at different stages of their careers. Through these initiatives, we aim to create a Congress that not only serves as a mirror of current practices but also as a catalyst for future advancements in our field.

Acknowledgments

The success of these Proceedings rests upon the shoulders of our dedicated Editorial Board and reviewers, whose unwavering commitment to scientific excellence has been instrumental. Their thorough, constructive feedback has not only enhanced the caliber of our publications but has also contributed to the professional growth of our authors. This collective effort epitomizes the collaborative spirit that defines our scientific community.

A Call for Active Participation

We warmly invite researchers, clinicians, educators, and students to join us in this collaborative journey. Your contributions are vital in shaping a future where pharmacotherapy and clinical pharmacy play a pivotal role in enhancing healthcare outcomes. By sharing your research and experiences, you enrich our collective repository of knowledge, benefiting practitioners and patients alike. Together, we can drive innovation, promote best practices, and make a meaningful impact on the health and well-being of communities worldwide.

Conclusion

The maturation of the Brazilian Congress of Pharmacotherapy and Clinical Pharmacy reflects the dedication and intellectual rigor of our community. As we publish these Proceedings, we do so with a profound appreciation for our achievements thus far and an unwavering commitment to future advancement. Our goal remains steadfast: to not merely document the state of our field but to actively participate in its evolution.

Through sustained collaboration and adherence to the highest scientific and ethical standards, we are poised to make lasting contributions to healthcare and society. As we prepare for our fifth congress, we remain dedicated to fostering an environment where innovation flourishes and excellence is the norm, not the exception.

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Editorial Board
4th Brazilian Congress of Pharmacotherapy and Clinical Pharmacy

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

An Integrative Review of the Impact of Clinical Pharmacists on Pharmaceutical Care and Interventions for Polymedicated Elderly Patients

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About this scientific work

DOI: 10.62922/4cbffc.cp002
Link: https://doi.org/10.62922/4cbffc.cp002
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Aging is a complex process resulting from the interaction between molecular and genetic processes over a lifetime, combined with individual health conditions and lifestyles. With the increase in the elderly population, focusing on improving quality of life and promoting healthy longevity is essential. Understanding the molecular process of aging and the interaction of various factors can be an effective strategy for healthy aging (1). Life expectancy has significantly increased due to improved living conditions, housing, and health. These factors have contributed to the growth of the elderly population, leading to the creation of policies and measures such as the Elderly Statute, the National Elderly Health Policy, and the National Elderly Policy (2). as age advances, the diseases affecting people change. In youth, predominant diseases were infectious and parasitic. Today, however, chronic and degenerative diseases are more common among the elderly, requiring continuous care and monitoring (3). The elderly are more vulnerable to health problems related to medications due to physiological changes associated with aging, comorbidities of chronic diseases such as cardiovascular diseases and psychological

disorders, as well as different responses to medications. This increases the likelihood of adverse drug reactions due to polypharmacy (4). Pharmaceutical care is crucial for a care plan aimed at improving patient quality of life. Studies show that patients receiving pharmaceutical care have positive outcomes, such as the identification and resolution of problems, reduced medication costs, and better management of polypharmacy (5).

Aim

The research seeks to examine the available literature on the role of the clinical pharmacist in pharmaceutical care, including their interventions and the impacts of these practices on the health of polypharmacy elderly patients. The analysis aims to better understand how pharmaceutical interventions can influence medication management and the quality of life of these patients, providing valuable information to enhance pharmaceutical care.

Methods

This study is an integrative review that synthesizes data from various methodologies and secondary sources, as outlined by Souza (6) and Whittemore & Knafl (7). The research involves several steps: formulating research questions, selecting and evaluating articles, and analyzing and presenting results. The P.I.C.O. strategy was employed to formulate the central research question (8), focusing on elderly patients with polypharmacy and the intervention in polypharmacy, aiming to investigate pharmaceutical care for this particular group. The search for articles utilized descriptors and their combinations in both Portuguese and English, including “Atenção farmacêutica” and “Idosos polimedicados”, “Pharmaceutical care”, “clinical pharmacist”, “elderly polypharmacy” and “Polymedicated elderly people” employing Boolean operators “or” and “and” on international data platforms. Data collection was conducted between July and August 2022, using the LILACS, SCIELO, and PubMed databases, with descriptors in both Portuguese and English. Articles addressing pharmaceutical interventions for polymedicated elderly patients, published within the last five years and in the specified languages, were included. Studies that did not meet the time frame or the subject criteria were excluded. The selected studies were analyzed descriptively, compiling and summarizing the knowledge generated on the topic, and the results were organized according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart to ensure the study's relevance and organization (9).

Results

The bibliographic data collection was conducted using the PRISMA flowchart, according to the search strategy defined in the methodology. Initially, 842 articles were retrieved for analysis. After review, only 20 articles were selected for the research. The results of this study demonstrate a significant prevalence of polypharmacy among the elderly and highlight the importance of pharmaceutical care. The studies were obtained from the following databases: LILACS (n=1), PUBMED (n=18), and SCIELO (n=1). Regarding bibliographic production, of the 20 articles, 1 was published in 2017, 3 in 2018, 7 in 2019, 3 in 2020, 4 in 2021, and 2 articles in 2022. The results obtained from this study show how prevalent

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

polypharmacy is in elderly people and that pharmaceutical care interventions can adjust doses, reduce drug interactions, lower costs, and improve the quality of life for geriatric and polymedicated patients.

Discussion

The clinical pharmacist (CP) should be skilled in accurately assessing patients and their medication therapy, developing or initiating a therapeutic plan, and monitoring the achieved outcomes, with the aim of providing patient-centered care (10). Pharmaceutical care is a structured and documented activity carried out in collaboration with users and healthcare professionals, aimed at treating or preventing problems that may affect medication therapy. This process is an essential part of medication therapy management. Health interventions (HIs), which include pharmaceutical interventions (PIs), are practices performed by clinical pharmacists within the scope of pharmaceutical care (11). The acceptance of pharmaceutical interventions by physicians is crucial for promoting rational drug use, ensuring appropriate pharmacotherapy for the patient, monitoring adverse reactions, reducing costs, and improving therapeutic management. This results in more targeted and effective patient care (12). Medication interventions performed by clinical pharmacists and accepted by physicians can bring significant benefits both to health and to the economy (13, 14, 15). Various factors can influence medication consumption among the elderly, with chronic multimorbidity standing out. Polypharmacy, a reality for many elderly individuals, tends to be constant and increasing due to the aging population (16). Pharmaceutical care is a highly effective approach for promoting the rational use of medications. The evidence demonstrates the significant impact of clinical pharmacy and the benefits derived from pharmaceutical interventions. Clinical pharmacists play a crucial role in monitoring elderly patients who use multiple medications, ensuring that prescriptions are appropriate and safe. Additionally, they closely follow the treatment, contributing directly to the health, cost-effectiveness, and well-being of the patients.

Keywords

Pharmaceutical Care; Elderly; Multimorbidity; Polypharmacy.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Metabolic Changes in Breast Cancer Survivors Under Hormonal Therapy

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About this scientific work

DOI: 10.62922/4cbffc.cp003
Link: https://doi.org/10.62922/4cbffc.cp003
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Diseases caused by metabolic dysfunctions have been generating high mortality rates worldwide for a while and are combined with others such as breast cancer (BC) in women. Currently, hormone therapy (HT) improves life expectancy and shows the importance of detecting and preventing risk factors that can exacerbate cardiovascular disease (CVD) and compromise the success of HT. Among them, therapy with antiestrogens and aromatase inhibitors play an important role in maintaining survival and, however, at same time contribute to negative events for cardiovascular health. (1) Clinical studies have shown that antiestrogens in ER+ breast cancer patients, due to the long time of treatment, can lead to increased body fat, hepatic steatosis, hypertriglyceridemia and risk of diabetes. On the other hand, it reduces low-density lipoprotein cholesterol (LDLc) and Lipoprotein (a), showing an effect that is either cardiovascular protective or harmful thromboembolic events (2). With aging, sedentary lifestyle and poor eating habits,

breast cancer patients face modifiable risks, such as metabolic disorders associated with an unfavorable lipid profile (triglycerides > 150mg/dL, HDL < 50mg/dL), one of the classic components of metabolic syndrome (MS). This increases the risk of CVDs, stroke and steatotic liver disease associated with Metabolic dysfunction-associated steatotic liver disease (MAFLD) (3), previously called Non-Alcoholic Fatty Liver Disease (NAFLD) (4). In addition to the metabolic challenges linked to MS, steatotic liver disease associated with metabolic dysfunction is a growing concern among oncology patients. This condition involves the accumulation of fat in hepatocytes, influenced by metabolic changes induced by endocrine therapy and the aforementioned profile. (5)

Aim

To describe and quantify the components of metabolic syndrome and its associated factors such as BMI, blood pressure, dietary profile, physical activity and the occurrence of reports of hepatic steatosis during treatment, aiming for greater guidance and reduction of problems in patients.

Methods

The study was conducted between 2022 and 2024 in a public hospital in Belém of Pará (Brazil) , involving 122 female patients undergoing outpatient treatment for breast cancer and who were undergoing hormonal treatment with tamoxifen (TAM) for an average of 30 months. In total, 97 patients had enough serum samples for analysis. The participants had an average age of 52 years and were predominantly from Belém or from the Metropolitan Region. The majority had already received chemotherapy and radiotherapy and mastectomy surgery. The selection was made by active search and spontaneous demand in the outpatient oncology pharmacy. A semi-structured questionnaire with questions and answers, containing sociodemographic and lifestyle data, history of diseases and comorbidities, medication history and anthropometric data was applied. Blood samples were obtained by venipuncture for biochemical analyses. It was used the criteria of the 1st Brazilian guideline for the diagnosis and treatment of metabolic syndrome for characterization: BP (Reference value: 120x80 mmHg), Waist circumference (WC; Reference value: 88 cm for women), HDL (reference value: >40 mg/dL), triglycerides (Reference value: < 150 mg/dL) and Obesity (BMI: Normal/ ≤ 24.9). All study participants were duly informed about the objectives and development of the research to authorize the collection of data and subsequent signing of the the use of the free and informed consent term under approval given by the Research Ethics Commite in their document under the No. 5.5.587.454-CEP/ICS. Analysis of the results was carried out using quantitative descriptive statistics and values expressed in percentages and or absolute/relative values.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

The majority of patients were between 50 and 59 years of age, with the majority coming from Belém and the metropolitan region. They declared themselves "pardo" race (grayish-brown; brown), with a family

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

income between 1 and 3 minimum wages (R$ 1412,00 - 4236,00 ; US$ 246,50 - 739,5), and had completed secondary education. They had already undergone mastectomy, chemotherapy, radiotherapy and started endocrine therapy with tamoxifen, with treatment time varying from 5 to 10 years. Among the 97 patients interviewed, 38 (39.1%) had triglycerides (TG) above 150 mg/dL and 73 (75.2%) had HDL below 50 mg/dL, indicating dyslipidemia. In relation to body mass index (BMI), only 20 (20.6%) were of normal weight, while the majority were overweight, 46 (47.4%) and obese, 31 (31.9%). Regarding the level of physical activity, 69 (71.2%) of them declared that they did not practice physical activity regularly, and were therefore classified as sedentary. Regarding food consumption, 95 (97.9%) reported consuming vegetables regularly, 97 (100%) reported eating fruit, 62 (63.9%) consumed whole foods and 25 (25.7%) stated consuming processed foods.

Discussion

In the context of breast cancer, increased TG levels and the development of hepatic steatosis are frequent issues, mainly due to molecular and hormonal changes generated by altered liver metabolism. Regarding the chemotherapy treatment itself, remission of metabolic changes is expected in the weeks following the end of the sessions (6). The adjuvant hormone therapy treatment, however, generates prolonged exposure to the aforementioned changes, further increasing the risk of developing the fatty disease. This is reinforced by studies that indicate that approximately 40% of patients undergoing TAM treatment develop hepatotoxicity, mainly in the form of steatopatitis. The average time for the development of these injuries is 22 months, the interval in which the majoriry of the 97 patients in this study were included. (7) In addition to managing the lipid profile, obesity is a key point in analyzing patients' exposure to steatosis, in addition to their lifestyle and eating habits. For example, an Italian study from 2023 showed that a greater consumption of red meat, processed foods, sausages and alcohol consumption was more often detected in the group with the fatty disease, compared to the others, especially among those with obesity, similar to the data observed in the present study. (8) It is clear and reletable that a negative metabolic profile impacts the prognosis of the BC itself, and even the effectiveness of hormonal treatment, leading to an increase in the production of estrogen, adipokines and proocongenesis, contrary to what was expected for the 97 patients in the research. (9)

Keywords

Breast Cancer; Hormonal Therapy; Steatosis; Survival.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Instruments for Assessing the Degree of Gender Dysphoria in Transgender Children

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About this scientific work

DOI: 10.62922/4cbffc.cp004
Link: https://doi.org/10.62922/4cbffc.cp004
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Gender dysphoria (GD) is characterized as distress associated with the incongruence between the gender with which a person identifies and the gender assigned at birth (1). The gender assigned at birth is generally determined based on the individual's genitalia, while gender identity is subjective and relates to the gender with which the person identifies, without necessarily being linked to their natal sex (2, 3). When an individual identifies with their biological sex, that person is known as cisgender, but when the perception does not correspond to their biological sex, the term transgender is more appropriate (4).

There are some people who, due to not experience this identification with their natal sex, present episodes of distress, characterized as GD, which impairs their school, social life, among other important aspects. This distress can affect children and adults as well (5). In this sense, to confirm the diagnosis of GD, this distress must be experienced for at least six months, according to the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). It is estimated that the prevalence of GD in the child and adolescent population is in the proportion of 2:1 among boys, 4.5:1 among girls, and 1:1 to 6.1:1 among adolescents (6). Among the methods used to assess GD are psychometric measurement scales, used in gender clinics for screening, supporting the diagnosis of GD, and monitoring patient care (7,8). The general approach for children with GD consists of psychological and non-pharmacological interventions. Therefore, to assist transgender children who have some degree of GD, it is necessary to accurately measure this construct through GD measurement instruments available in the scientific literature, to individualize patient care and improve their quality of life (9).

Aim

The objective of this study was to identify the main instruments for assessing gender dysphoria in transgender children.

Methods

A scoping review of the literature was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) standard (10). The searches were conducted from August 2023 to July 2024, in two databases, Scopus and PubMed. The descriptors used were: “gender dysphoria”, “tool” or “scale”, “surveys” or “questionnaires” and their combinations. The search strategy used standardized terms from the controlled vocabulary of the “National Library of Medicine” through the “Medical Subject Headings (MESH)”. The inclusion criteria were established according to the mnemonic “PCC”, which stands for population-concept-context, where P: Transgender children; C: gender dysphoria; and C: instrument for measuring the degree of gender dysphoria, forming the following research question: “What are the instruments used to measure gender dysphoria in transgender children?”. Therefore, studies that met the following criteria were included: (I) validation studies, (II) studies in Spanish, English, and Portuguese, and (III) instruments with children as the target audience. No limitations were applied in terms of the year of publication or study design. The following studies were excluded: (I) literature reviews; (II) editorials; (III) reviews; (IV) letters and (V) course completion papers. The selected articles were imported into the Rayyan website and duplicates were removed (11). Two independent reviewers (ECJ and LSSC) examined the search results and identified potentially relevant studies according to their titles and abstracts. Relevant studies were read in full and selected according to the eligibility criteria. Disagreements in study selection were resolved by a third reviewer (CMLS). After study selection, data were extracted and tabulated in an Excel spreadsheet.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Results

The initial search identified 472 studies in the PubMed database and 20 studies in Scopus. After excluding 452 studies, 40 studies remained for full-text evaluation. Of these, 37 studies were excluded, leaving 3 studies that were included in the scoping review. In total, three instruments were identified, which were validated by specific psychometric properties, namely: (I) Gender Identity Questionnaire (GIQ), with 16 items, completed by parents and with a binary structure, whose validation included central axis factor analysis, specificity (95%) and sensitivity (86.8%); (II) Italian version of the Gender Identity Questionnaire for Children (GIQC), with 16 items, also completed by parents and with a binary structure, using exploratory factor analysis for validation (Kaiser–Meyer–Olkin = 0.81), confirmatory factor analysis and reliability through internal consistency (Cronbach's α values > 0.75); and (III) Gender Identity/Gender Dysphoria Questionnaire for Adolescents and Adults (GIDYQ-AA), with 27 items, self-administered and with a binary structure, which used construct validity for validation (Kaiser–Meyer–Olkin = 0.97), and Bartlett's sphericity test was significant (at $p < 0.001$), in addition, a principal axis factor analysis was also performed.

Discussion

In recent years, the number of children and adolescents experiencing GD has increased significantly. Consequently, the number of children seeking specialized gender transition services has also increased, revealing higher rates of psychiatric diagnoses such as depression and anxiety, as well as more severe conditions with significant numbers of suicide and self-harm (12). Thus, to address the professional needs and clinical demands of transgender people, instruments based on constructs that are directly related to GD have been developed (13). These include body dissatisfaction, gender identity, social, somatic, subjective, and other parameters related to GD. A study conducted in the Netherlands using the GIQ for transgender children and the Utrecht Gender Dysphoria Scale (UGDS) for transgender adolescents compared the self-perception of these individuals with their standardization samples and examined the differences in referrals to gender clinics between the two groups. The study stated that the GIQ demonstrated excellent psychometric properties and was able to distinguish transgender children who met the full DSM criteria from those who did not (14). Additionally, a study conducted in Nigeria using the GIDYQ-AA aimed to determine the spectrum of GD symptoms among adolescents and young adults in the African population and its relationship with sociodemographic and psychosexual variables. These results were discussed as relevant, such as higher levels of GD in adolescents in the middle phase (15–17 years) and late adolescence (18–24 years) when compared to early adolescents (10-14 years), who showed significantly higher dysphoric symptoms (13). It is worth mentioning that, recently, in a study conducted in the United States with transgender people, the UGDS and GIDYQ-AA scales were applied, which have a binary structure. The study’s findings indicated that non-binary people rated both scales as less effective in capturing their dysphoria experience (15). Nevertheless, all the identified scales were well evaluated in terms of their psychometric properties. Consequently, such scales have the potential to be utilized in healthcare services to identify and measure the dysphoric experiences of a transgender child. The present study facilitated the recognition of the instruments already used to

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

measure GD and highlighted the need for the existence of instruments that can be used by children and young people, in a way that is not restricted to the binary structure and encompass all gender spectra.

Keywords

Gender Dysphoria; Questionnaires; Transgender Children.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmaceutical Care for Insulin-Treated Type 2 Diabetes Mellitus Patients: Experience From the Public Health Service in a Small Municipality

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About this scientific work

DOI: 10.62922/4cbffc.cp005
Link: https://doi.org/10.62922/4cbffc.cp005
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Diabetes mellitus (DM) is one of the fastest-growing chronic diseases worldwide (1). The management of this condition is directly linked to both pharmacological and non-pharmacological treatments, including lifestyle changes (2). In this context, the Unified Health System (SUS) provides medications (oral antidiabetics and conventional insulins) and the necessary supplies for monitoring capillary blood glucose and insulin administration to patients with DM (3). The medication regimen often presents great

complexity, which complicates adherence to pharmacotherapy and increases medication errors. Non-adherence to medication treatment can result in negative outcomes in glycemic control, in addition to increasing disease complications (4). Thus, the presence of a pharmacist is essential to assist in this process, contributing to the improvement of health outcomes (5). Pharmaceutical care stands out as a practice that guides the provision of various pharmaceutical services aimed at patients, their families, and the community, with the aim of preventing and resolving problems related to pharmacotherapy and the rational use of medications (6). In this way, pharmaceutical care involves the joint action of the pharmacist with the health team, placing the user at the center and benefiting them with the provision of pharmaceutical services. These services can be offered during a pharmaceutical consultation, carried out in an office or other suitable environment, with the aim of obtaining the best results from pharmacotherapy (6,7). Additionally, the pharmaceutical consultation can be conducted in the form of a home visit, allowing observation of issues related to housing conditions, hygiene, lifestyle habits, and medication storage. This provides a closer connection between the community and the health service and considers the social context of the user, contributing to the care plan being adapted to their individual reality.

Aim

The objective of this study was analyzing the effectiveness of Pharmaceutical Services and Policies for patients with type 2 diabetes mellitus (DM2) using insulin, treated in a municipality in the State of Parana, which does not have commercial pharmacies and private clinics, so that all inhabitants are served by the Unified Health System (SUS).

Methods

This prospective quasi-experimental study was conducted with patients diagnosed with DM2 using insulin, treated in Primary Health Care in a small municipality in the State of Parana, from July 2019 to June 2020. The research was approved by the Human Research Ethics Committee of the State University of Ponta Grossa, according to opinion No. 3.409.608/2019. The intervention carried out by a pharmacist from the city's Health Center, with the 21 users included in the study, was pharmaceutical care. The pharmaceutical consultations began with a home visit to assess each patient's health-related quality of life. Subsequent consultations took place at the pharmacy of the city's Health Center. an individualized care plan was developed considering each user's needs, with the frequency of consultations varying between monthly and weekly. When pharmacotherapy-related problems were detected, pharmaceutical interventions were carried out directly with the patient or jointly with the prescriber, and all interventions were recorded in the user's medical record. to analyze the effectiveness of pharmaceutical care, humanistic outcomes (quality of life - QoL) and clinical outcomes (reduction in glycated hemoglobin - A1c) were evaluated by comparing data obtained before and after the care process. The quality of life of the patients was assessed using the specific instrument DQOL-Brasil-8 (Diabetes Quality of Life Measure-8), which contains 8 multiple-choice questions organized into 4 domains. The closer to 1, the better the perception of QoL (8). A1c test results were evaluated according to the goals established by the Brazilian Diabetes Society and the American Diabetes Association (9, 10). According to these societies, each patient's therapeutic plan should be individualized according to age and functional

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

status. The collected data were entered and analyzed in SPSS® for Windows, with a significance level of 5%.

Ethics
The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

During pharmaceutical care intervention, a total of 132 pharmaceutical consultations were conducted over an 8-month period. The sociodemographic data analysis from 21 patients showed that most participants were female (66.7%), with a mean age of 63.1 years (SD = 8.7), ranging from 51 to 87 years. The sample had a low educational level and a predominance of low family income. Data concerning pharmacotherapy were collected and analyzed both prior to and following the follow-up period. Initially, all participants were classified as polypharmacy patients, with an average of 7.5 medications (interquartile range 6–9). Upon re-evaluation at the study's conclusion, these data were analyzed, which revealed a significant reduction in the number of medications utilized following the implementation of pharmaceutical care: the average number of medications decreased to 7.0 (interquartile range 5–8) ($p<0.05$). Regarding quality of life, the application of the DQOL-Brasil-8 instrument revealed an initial total score of 3.01, which decreased to 2.18 by the study's end. This reduction indicates an improvement in the patients' perceived quality of life following the intervention. When separating users into two groups, adults and elderly, it can be noted that age has an effect on the score DM concerns domain ($p<0.05$) and on the total score ($p<0.05$), but has no effect on satisfaction and impact scores, showing that elderly people have less concern than adults, consequently their QoL is better. Analysis of A1c results revealed that the percentage of patients achieving the desired therapeutic goal for glycemic control increased from 22.2% to 38.9% following the intervention. Furthermore, 14 patients exhibited a significant improvement, with a mean reduction of 1.5% in A1c levels ($p<0.05$), ranging from 0.2% to 10.4% on an individual basis. Beyond the statistical significance, the clinical relevance of this reduction for patient outcomes is noteworthy.

Discussion

This study verified the effectiveness of pharmaceutical care in patients with insulin-dependent DM2 in a small municipality that is entirely dependent on the public health system. The improvement in perceived quality of life and the reduction in A1c levels are motivating and significant results for the treatment of these patients. Polypharmacy, common among patients with DM, was also observed in this study. The high number of prescribed medications can complicate proper use and increase the risk of drug interactions and adverse reactions. However, there was a slight but significant reduction in the number of prescribed medications after pharmaceutical care, benefiting the patients. It is important to note that access to medication is only one tool in the care of DM patients, who require constant follow-up (11). The initial pharmaceutical consultation via home visit allowed for an understanding of the patient's reality and family dynamics. This enabled more personalized care, emphasizing the proper use of insulin and its supplies. After establishing an individualized care plan, pharmaceutical interventions were performed,

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

primarily in counseling and pharmacotherapy adjustments. These interventions resulted in the deprescription of some medications, reducing polypharmacy and improving treatment adherence. Some studies (12,13) indicate most interventions focus on patient education and motivation rather than medication changes. The pharmacist's good integration within the healthcare team was reflected in the high acceptance of the interventions by the prescriber, as well as the autonomy to order laboratory tests. The bond between the pharmacist and the patient contributed to the success of the interventions, improving treatment adherence and other evaluated outcomes. Regarding the humanistic outcome, studies point out perception of quality of life assesses the impact of diseases and treatment on patients' lives (14). It was found that the greater the impact of the disease and concern with DM, the worse the perception of quality of life. Evaluating the perception of quality of life is crucial because clinicians usually focus on preventing complications and monitoring biochemical parameters, especially A1c, neglecting quality of life (8). This study demonstrated a significant improvement in perceived quality of life after pharmaceutical care. The significant improvement in A1c levels observed reinforces the clinical importance of this reduction, directly related to the decrease in microvascular complications, as demonstrated in classic studies (15,16). In the municipality of this study, strategies such as the decentralization of administrative activities allowed the pharmacist to dedicate themselves to pharmaceutical consultations. Management support and trust in the pharmacist integrated into the team were fundamental. Difficulties encountered included lack of patient motivation, low health literacy, reduced cognitive capacity, socioeconomic conditions, and the presence of comorbidities. The pharmacist had to develop individual educational strategies to increase patients' knowledge and motivation, empowering them for self-care. This study left a positive legacy, with the acceptance of pharmaceutical consultations by the healthcare team and the referral of the service to other patients. The patients were motivated to continue treatment, especially because they felt welcomed by the service and saw improvements in A1c results.

Keywords

Glycemic Control; Quality of Life.

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DOI: 10.62922/4cbffc
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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Pharmacist's Role in the Pharmacotherapeutic Follow-Up of Pediatric Oncology Patients: a Narrative Review

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About this scientific work

DOI: 10.62922/4cbffc.cp006
Link: https://doi.org/10.62922/4cbffc.cp006
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Oncology is the specialty dealing with tumors and cancer, with chemotherapy being one of the main treatment modalities. It involves the use of chemical agents, either in combination or alone, aimed at being either palliative or curative, depending on the disease's extent, tumor type, and patient condition (1). The role of the pharmacist in pediatric oncology is multifaceted, encompassing clinical and therapeutic activities, patient and family education, logistics, drug preparation, among others, as noted in Resolution No. 288 of 1996, which outlines the pharmacist's responsibilities regarding antineoplastic

drugs in chemotherapy treatment (2). Pharmacists' activities begin with the selection, standardization, acquisition, and conservation of medicines and pharmaceutical inputs, ensuring compliance with governmental regulations (3). Pharmacists must carefully analyze patient prescriptions, clinical examinations, and individual patient specifics, as outlined in Resolution No. 357 of the Federal Pharmacy Council (CFF), which details the legal and regulatory obligations of pharmacists in their pharmaceutical care (4). The focus of pharmaceutical care for pediatric oncology patients includes counseling and monitoring pharmacological therapy to ensure treatment adherence and build patient-pharmacist trust (3). A multidisciplinary team is crucial for addressing the needs of pediatric oncology patients, with pharmacists playing an increasingly important role in ensuring the quality of oncological procedures. Pharmacotherapy follow-up is vital for reducing medication errors and improving treatment efficacy and patient quality of life (5, 6). Studies emphasize the pharmacist's role in resolving medication-related issues and enhancing treatment safety, adapting to each patient's needs, and positively impacting treatment outcomes. Proper planning can also reduce hospital costs by minimizing medication waste and shortening patient hospitalization periods (7).

Aim

To analyze the pharmacist's role in pharmacotherapy follow-up for pediatric oncology patients.

Methods

This narrative review employed a qualitative and descriptive approach from June to September 2023, following these steps: formulating the guiding question; searching primary databases; selecting studies; evaluating selected studies; and discussing results. The guiding question was: "What are the pharmacist's roles in pharmacotherapy follow-up for pediatric oncology patients?" Databases such as Google Scholar, LILACS, and ScienceDirect were searched using descriptors from the Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH) with Boolean operator "AND" for combinations like "Assistência Farmacêutica" AND "Pediatria" AND "Oncologia" OR "Antineoplásicos" in Portuguese and "Pharmaceutical Services" AND "Pediatrics" AND "Medical Oncology" OR "Antineoplastic Agents" in English. Eligible studies were selected through detailed reading of abstracts, with inclusion criteria being articles published between 2018 and 2023 in Portuguese and English. Exclusion criteria included studies not addressing the guiding question and conference abstracts. From 416 articles found, 20 duplicates were removed, leaving 396 articles. After title and abstract screening, 62 articles were selected for full reading. From these, 47 were excluded for not answering the study question or being conference abstracts, resulting in 15 scientific publications fitting the established theme.

Results

Childhood cancer, or pediatric cancer, involves the development of malignant tumors in children and adolescents. Although rare compared to adult cancers, pediatric cancer remains a significant health concern due to its impact and the complexities associated with diagnosis and treatment in young populations (8). Pediatric cancers represent about 1% to 3% of all cancer cases but are the leading

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

cause of disease-related deaths in children in many industrialized countries (9). Common types include leukemias, central nervous system tumors, and lymphomas (10). Pediatric cancers are less associated with behavioral risk factors and more often result from genetic mutations or hereditary conditions (11). Chemotherapy is a primary treatment for childhood cancer, involving specific drugs that destroy or control cancer cells (15). It is often combined with other treatments like surgery and radiotherapy for optimal outcomes (16). Protocols are tailored based on cancer type, disease stage, child's age, and individual factors. Medications used include idarubicin and imatinib for leukemias, dacarbazine and rituximab for lymphomas, qarziba for neuroblastoma, and cyclophosphamide for various cancers (17). Chemotherapy can be administered orally, intravenously, intramuscularly, or intrathecally, depending on the medication and treatment plan (18). Chemotherapy is administered in cycles with treatment periods followed by rest periods to allow recovery from side effects and minimize damage to healthy cells (19). Side effects in children are particularly challenging due to their developing bodies, including nausea, vomiting, hair loss, fatigue, and bone marrow suppression leading to infections and clotting issues (20). Pharmacists play a critical role in managing these side effects, ensuring optimal care for the child during chemotherapy through supportive medications and lifestyle guidance (21).

Discussion

The pharmacist's role in pediatric oncology is critical for ensuring treatment safety, efficacy, and quality of life for children with cancer. Their duties span precise chemotherapy preparation, side effect management, drug interaction evaluation, and resolving medication-related issues. Recent studies underscore the importance of pharmacists in optimizing treatment and addressing efficacy and safety issues, especially in leukemia and other pediatric cancers. Continuous pharmacotherapy follow-up is essential for minimizing errors, enhancing treatment effectiveness, and improving patient outcomes. Despite significant advances, long-term side effects of aggressive treatments are a concern, necessitating continuous follow-up by a multidisciplinary team. Pharmacists assess drug interactions among the multiple medications pediatric cancer patients often take, ensuring treatment efficacy and safety. Common pharmaceutical interventions include dose adjustments, patient counseling, additional treatment needs, infusion rate adjustments, therapeutic alternative selection, treatment effectiveness evaluation, medication suspension, medication reconciliation, and therapy modification. Antineoplastic drugs frequently associated with interventions include methotrexate and vincristine, while ondansetron and sulfamethoxazole-trimethoprim are prevalent in supportive treatment. A study identified medication-related problems in 5.3% of prescriptions analyzed, predominantly in leukemia patients aged 0-4 years and male. The main problems were efficacy (49.2%) and safety (33.2%), often due to inadequate selection and dosing. Pharmacist interventions were accepted in 92.2% of cases, resolving 90.6% of issues. Frequently involved drugs included mercaptopurine and filgrastim, with oral antineoplastics comprising 36% of problem prescriptions. Pharmacists are crucial in ensuring the safety, efficacy, and quality of life for pediatric cancer patients undergoing treatment. Their responsibilities include preparing chemotherapy doses according to medical prescriptions, following strict safety standards to avoid contamination and dosage errors (22). Pharmacists also monitor patients, manage chemotherapy side effects, provide guidance to patients and parents on potential adverse effects, and adjust supportive therapies to minimize negative impacts. Pharmacotherapy follow-up by pharmacists

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

significantly reduces medication and treatment errors, enhancing efficacy and patient quality of life. Pharmacists ensure that medication therapy is appropriately indicated, effective, safe, and convenient for pediatric patients.

Keywords

Pharmaceutical Services; Pediatrics; Antineoplastic Agents.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Implementation of an Antimicrobial Management Program in Nicu in a School Maternity Hospital

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About this scientific work

DOI: 10.62922/4cbffc.cp007
Link: https://doi.org/10.62922/4cbffc.cp007
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Antimicrobials are a class of medications widely used in neonatology, which can contribute to the development of multidrug-resistant bacteria, late-onset sepsis, enterocolitis and neonatal deaths. Antimicrobial resistance is recognized worldwide as a global threat to Public Health. The English term Stewardship is used to talk about the operationalization of an Antimicrobial Management Program (AMP) within health services and is closely linked to quality improvement. PGA refers to interventions to improve appropriate antimicrobial use, improve patient outcomes, reduce costs, and prevent antimicrobial resistance (1).

Aim

To describe the results obtained to date with the implementation of an antimicrobial management program in a NICU.

Methods

An antimicrobial management team was formed with activities focused on the NICU. The team visits the unit three times a week, discussing patients using antimicrobials with the attending physicians and providing guidance regarding suspension, escalation, de-escalation, treatment time, dose adjustment, time and frequency of antimicrobials. The consumption of antimicrobials was calculated using the "Days of Therapy" indicator - DOT. For comparison, this study was divided into 2 periods: period 1: immediately after PGA implementation, and period 2: after 6 months of PGA implementation.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

Comparing period 1 with period 2, the following results were obtained: the DOT of ampicillin in period 1 was 362, while in period 2 it was 321. Gentamicin had a DOT in period 1 of 380 and in period 2, 329. The Amikacin's DOT in period 1 was 192, and period 2 was 249. Oxacillin's DOT went from 210 to 197 in the second period. Vancomycin, in period 1, had a DOT of 617, and in the second period, 400, while cefepime had a DOT of 290 in period 1, and 297 in period 2. Meropenem's DOT went from 415 in period 1, to 321, in period 2.

Discussion

The results obtained show that there was a reduction in the consumption of the vast majority of antimicrobials in period 2, compared to period 1, showing the benefits of PGA. There was a 12% reduction in the consumption of ampicillin, 14% of gentamicin, 35% of vancomycin and 22% in the consumption of meropenem. The strategies adopted by the team were prospective audit and feedback, which brought considerable benefits in reducing the period of antimicrobial exposure and ensuring the appropriateness of antibiotics (choice and duration). Long-term use of antimicrobial agents is associated with dysbiosis and an increased risk of mortality, severe morbidity, severe bronchopulmonary dysplasia, and necrotizing enterocolitis, as well as long-term adverse health consequences such as celiac disease, diabetes, and asthma. In this way, reducing the consumption of antimicrobials can bring important benefits to patients and the institution itself. Broad-spectrum antimicrobials are particularly harmful due to the increase in extended-spectrum β-lactamase organisms and carbapenem-resistant enterobacteria. Therefore, reducing the consumption of vancomycin and meropenem is of fundamental importance for preserving the institution's microbial flora, preventing the emergence of resistance, in addition to representing an important economic and sustainability impact. In the future, the intention is to present the financial impact of reducing antimicrobial days at the institution, as well as monitoring the microbiological profile over time to verify the emergence of resistant bacteria. The PGA is, therefore, of fundamental importance, providing maternity hospitals with a powerful tool for reducing adverse events related to antimicrobials, controlling the costs of purchasing medicines and protecting the microbial flora.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Antimicrobial Stewardship Programs; Neonates.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Arterial Hypertension Screening Among Unioeste University Employees

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About this scientific work

DOI: 10.62922/4cbffc.cp008
Link: https://doi.org/10.62922/4cbffc.cp008
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Arterial Hypertension (AH) is one of the most prevalent diseases in Brazil and worldwide (1, 2). It is characterized by continuous and persistent elevation of blood pressure (BP) and it is one of the most important risk factors for cardiac complications, such as ischemic heart disease, heart failure, stroke, other cardiovascular diseases and chronic kidney disease (3). Because it is asymptomatic, many patients go for long periods with the disease progressing without a diagnosis or treatment. A lot of patients will only seek assistance when there are clinical signs of target organs damage. Screening

actions in AH, especially in primary care, are effective measures for early diagnosis and prevention of risks associated with elevated blood pressure (1). Furthermore, screening actions for AH provide an opportunity to educate patients about risk factors for cardiovascular diseases and lifestyle changes that can be helpful (4). Pharmacists occupy an important role in health system and can contribute to the provision of this service in their routine, in multiple environments, especially in community pharmacies (4-6). These professionals can identify and refer at-risk patients to their physicians for further assessment to minimize health risks (6). The university studied, Universidade Estadual do Oeste do Paraná (UNIOESTE), consists of 5 campuses, located in the cities of Cascavel, Foz do Iguaçu, Francisco Beltrão, Marechal Cândido Rondon and Toledo, in addition to the Rectory and the University Hospital, located in the city of Cascavel. All these units have different administrative sectors, in which permanent and temporary employees work. to date, no AH screening study has been carried out with UNIOESTE employees.

Aim

The objective of this study is to track suspected cases of AH among the university employees and identify risk factors related to the development of AH.

Methods

This is a cross-sectional study conducted at UNIOESTE, which evaluated employees from the Rectory and Cascavel campus units, approved by the UNIOESTE Human Research Ethics Committee (nº 5,674,231). The inclusion criteria were age ≥ 18 years and without diagnosis of AH (reports not knowing if they have AH, never received this information from a physician and does not use antihypertensive medication). University professors, pregnant women and patients with suspected secondary hypertension were excluded. Data were collected at the workplace after prior scheduling. Using a structured form, sociodemographic, clinical and anthropometric data were collected, allowing us to understand the participant's profile and risk factors. to measure BP, automatic, calibrated sphygmomanometers were used, according to the Brazilian Guidelines of Hypertension (7). Considered a suspected case of AH when BP ≥ 140/90 mmHg and for diabetics ≥ 130/80 mmHg and suspected hypertensive urgency when BP ≥ 180/120 mmHg. Employees who presented BP ≥180/120 mmHg, associated or not with symptoms were referred to emergency services. Height and weight were obtained from information reported by the participant to calculate the body mass index (BMI) (8). Descriptive statistics were performed for all variables. Variable normality was assessed with Kolmogorov-Smirnov and Shapiro-Wilk tests and re-evaluated through visual inspection of histograms/Q-Q normal plots, which revealed the pattern. For continuous variables with a non-normal distribution, results were reported as median and interquartile range (IQR Q1 – Q3) and categorical variables were reported as absolute and relative frequencies. All analyses were conducted in IBM SPSS Statistics v. 25.0.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Results

A total of 144 employees were included in the study, most of them women (68.1%) with a median age of 40 years (IQR 24 – 49.75). Just over half reported practicing physical activity (n=76; 52.8%), 18.3% reported smoking habit and 56.3% reported the habit of drinking alcoholic beverages. Most participants have a family history of AH (68.1%) and a family history of cardiovascular events (51.4%). Only 29.9% claimed to have a diagnosed disease and 27.8% use at least one long-term medication. The median systolic BP was 118.5 mmHg (IQR 111.2 – 128.1 mmHg) and the median diastolic BP was 76.1 mmHg (IQR 69.6 – 81.8 mmHg). However, 17 employees (11.8%) had an uncontrolled PA; among these, only 2 (11.8%) accepted BP values compatible with hypertensive emergency (BP ≥180/120 mmHg). The median BMI was 25.6 kg/m2 (IQR 22.4 – 28.9) and 33.8% were classified as overweight, 15.8% as grade I obesity and 3.6% as grade II obesity.

Discussion

This AH screening study shows the importance of actions aimed at early detection of this condition in the population. The 17 employees who showed BP values suggestive of AH were notified about the asymptomatic clinical aspect and were able to benefit from educational activities to prevent the disease evolution and control risk factors. Everyone was advised to seek medical care for early diagnosis. In 2002, the World Health Organization identified elevated BP as the main risk factor for mortality, predicting an epidemic of hypertension and defining community programs for the prevention of cardiovascular diseases as a priority (9). Although different guidelines recommend screening for AH to aid in early diagnosis (7, 10), there are few actions in this context. Recently, the United States Preventive Services Task force reaffirmed its recommendation for screening for hypertension in adults aged 18 years or over, using out-of-office BP measurements to later confirm the diagnosis before starting treatment (recommendation A) (11). The low proportion of suspected cases found was expected, considering the age of the population assessed. However, the high prevalence of family history (68.1%) of AH, as well as the presence of history of cardiovascular events (51.4%), points to the need to control modifiable risk factors for AH. The main risk factor identified in these patients was increased body weight. With the aforementioned weight and height information, the calculated BMI showed that 33.8% were overweight, 15.8% were grade I obesity and 3.6% were grade II obesity. Excess weight gain is a major cause of AH (12), accounting for 65% to 75% of the risk for AH (13). Although the aforementioned weight and height information may have underestimated BMI values, more than half of the employees were overweight, emphasizing the importance of implementing preventive measures for AH. Among these employees with uncontrolled BP, 2 employees showed values compatible with hypertensive urgency and were promptly referred to the city's emergency services. Seeking timely emergency medical care provides numerous health benefits to the patient, as well as increasing survival rates (14). The results of this study show the need for investment in screening strategies, considering that many people with AH are asymptomatic and are unaware of their diagnosis.

Keywords

Blood Pressure; Primary Care; Cardiovascular.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Evidence-Based Therapies for Hypertension: a Literature Review

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About this scientific work

DOI: 10.62922/4cbffc.cp009
Link: https://doi.org/10.62922/4cbffc.cp009
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 30/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Hypertension is one of the leading causes of global morbidity and mortality, significantly contributing to cardiovascular events such as myocardial infarction, stroke, and kidney failure. According to the WHO, it affects approximately 1.28 billion adults worldwide, often being underdiagnosed and undertreated. Effective management is crucial for reducing the burden of cardiovascular diseases and improving quality of life (1). International guidelines, such as those from the ACC and AHA, recommend lifestyle interventions as the first approach. However, these interventions are often insufficient, making pharmacological therapy necessary. The choice of treatment should be based on scientific evidence, aiming for effective blood pressure control and cardiovascular risk reduction (1,2).

Aim

To explore pharmacological therapies based on the best scientific evidence for treating hypertension, focusing on major drug classes and emerging new therapies.

Methods

A literature review was conducted to identify and analyze effective pharmacological therapies for hypertension. The search included databases such as PubMed, Scopus, and Web of Science, as well as the UpToDate platform. Studies published between 2014 and 2024, in English or Portuguese, addressing therapies for hypertension in adults were included, covering systematic reviews, meta-analyses, randomized clinical trials, guidelines, and cohort studies. Studies on pediatric populations, pregnant women, or those not peer-reviewed were excluded. A combination of search terms such as "hypertension treatment" and "antihypertensive drugs" was used. Selection involved analyzing titles, abstracts, and full articles that met the criteria. Data on study type, interventions, participant characteristics, outcomes, and main results were extracted and qualitatively analyzed, comparing them with ACC and European Society of Hypertension guidelines. Consultation with UpToDate ensured the inclusion of up-to-date information on new therapies.

Results

Thiazide diuretics, such as chlorthalidone, are recommended as first-line therapy due to their efficacy in studies like ALLHAT, which demonstrated a reduction in cardiovascular risk. Chlorthalidone is superior to hydrochlorothiazide in reducing cardiovascular events, although with a slightly higher risk of hypokalemia (3). ACE inhibitors, such as ramipril and perindopril, significantly reduce cardiovascular morbidity and mortality, particularly in patients with diabetes or chronic kidney disease, although they may cause cough and angioedema (4). ARBs, such as losartan and valsartan, are effective alternatives when ACE inhibitors are not tolerated, showing significant cardiovascular protection (5). Calcium channel blockers (CCBs), such as amlodipine, are effective in isolated systolic hypertension and improve cardiovascular outcomes when combined with other agents (6). Beta-blockers are effective in controlling blood pressure but offer less cardiovascular protection compared to other classes, being more useful in patients with specific comorbidities (6).

Discussion

Hypertension management should be evidence-based, with therapeutic choices tailored to the patient. Thiazide diuretics, especially chlorthalidone, are first-line due to their efficacy in reducing cardiovascular events (3). ACE inhibitors and ARBs are recommended for patients with comorbidities, with the choice between them based on individual tolerance. CCBs are effective for isolated systolic hypertension and, when combined with ACE inhibitors or ARBs, improve blood pressure control and reduce cardiovascular risk (6). Beta-blockers, although less recommended as first-line, are important in specific conditions such as heart failure and post-myocardial infarction. New therapies, such as direct renin inhibitors and mineralocorticoid receptor antagonists, are being explored for resistant hypertension, with the potential to benefit patients who are difficult to treat with conventional therapies. Early studies suggest these new options may be useful for specific patient subgroups.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Clinical Pharmacy; Hypertension.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmaceutical Care in the Prophylaxis of Gastric Mucosal Injury in Intensive Care Unit Patients

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About this scientific work

DOI: 10.62922/4cbffc.cp010
Link: https://doi.org/10.62922/4cbffc.cp010
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Acute Gastric Mucosal Lesion (AGML), commonly known as stress ulcer, refers to upper gastrointestinal bleeding and is associated with critically ill patients exposed to physiological stress, mechanical ventilation (MV), sedation, trauma, and coagulopathies (1). Although most patients remain asymptomatic, AGML often manifests as episodes of gastrointestinal bleeding, which can increase

mortality rates by one to four times and prolong intensive care unit (ICU) stays (2). Among the measures to prevent or reduce these events, prophylaxis with proton pump inhibitors (PPIs), for example, becomes essential (3). In this context, considering that the pharmacist is the professional closely linked to medication management, their role becomes crucial in promoting, alongside the multidisciplinary team, the prevention of AGML, contributing to the implementation of prophylaxis protocols and the appropriate use of PPIs, ensuring that patients receive treatment according to their needs and improving clinical outcomes.

Aim

The objective of this study was to analyze pharmaceutical interventions aimed at AGML prophylaxis in a philanthropic hospital in João Pessoa-PB, during the pharmacotherapeutic follow-up of patients in the ICU.

Methods

This is a cross-sectional retrospective study conducted in a philanthropic cardiology reference hospital in João Pessoa-PB. The sample consisted of 1,392 records of pharmaceutical notifications made from January to December 2023, obtained from the pharmacotherapeutic follow-up of patients in general and coronary ICU beds, performed by clinical pharmacists of the Multiprofessional Residency in Hospital Health at Faculdades Nova Esperança (FACENE). The selection criteria included patients over 18 years old who received pharmacotherapeutic follow-up during their ICU stay from January to December 2023. Patients who received pharmacotherapeutic follow-up outside this period were excluded. This research followed the ethical code for pharmacists according to CFF Resolution 724/2022 and was approved by the Ethics Committee of Faculdades de Enfermagem Nova Esperança (FACENE) under CAAE: 68131822.5.0000.5179.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

After data analysis, 1,392 pharmaceutical interventions were identified, performed by clinical pharmacists during pharmacotherapeutic follow-up in the two ICUs of the studied hospital. Of this total, 5.89% (n=82) were related to AGML Prophylaxis. All these interventions referred to the addition of AGML prophylaxis. The study also analyzed the acceptance of these interventions by the medical team, and the majority were accepted with a percentage of 98.78% (n=81).

Discussion

Among the pharmaceutical interventions that can be performed in the hospital context, particularly for critically ill patients, the addition of AGML prophylaxis stands out, especially through the introduction of proton pump inhibitors (PPIs) into the pharmacotherapy. This intervention can occur in various

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

circumstances, facilitated by the work of clinical pharmacists in the prevention of stress ulcers, which occur due to intense physiological stress and can lead to significant gastrointestinal bleeding; upper digestive bleeding, which can be a serious complication in critically ill patients, increasing morbidity and mortality; and infectious complications, as the breakdown of the gastric mucosal barrier can facilitate bacterial translocation and increase the risk of secondary infections. Therefore, AGML prophylaxis is essential in treating patients exposed to critical and complex conditions such as ICU admission, coagulopathies, mechanical ventilation, chronic liver failure, corticosteroid and non-steroidal anti-inflammatory drug use, history of gastric disorders, sepsis, and septic shock. This underscores the need for continuous evidence-based follow-up in accordance with established clinical protocols. Another relevant finding in this study was the high acceptance rate of this prophylaxis by the medical team (98.78%, n=81), ensuring the effectiveness of the clinical treatment and highlighting the effective communication between clinical pharmacists and other team members. Additionally, it shows the pharmacists' commitment to ensuring treatment compliance and preventing gastric complications by promoting adequate and safe pharmacotherapy for patients. Therefore, the study highlights the importance of clinical pharmacists in intensive care units, contributing to the effective implementation of prophylactic measures such as AGML prevention, ensuring better clinical outcomes. It reflects not only the application of best practices for AGML prevention but also emphasizes the significant impact of these professionals in protecting the gastrointestinal integrity of critically ill patients. Their role strengthens the bond between multidisciplinary teams, supporting a safe and comprehensive approach to patient management and enhancing the quality of care.

Keywords

Clinical Pharmacists; Gastric Ulcer; Icu.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmaceutical Interventions in the Management of Patients Using Beta-Blockers at a Philanthropic Cardiological Reference Hospital

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About this scientific work

DOI: 10.62922/4cbffc.cp011
Link: https://doi.org/10.62922/4cbffc.cp011
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Beta-blockers (BB) are a class of antihypertensives widely used for various cardiovascular conditions (1). Although some large-scale meta-analyses have shown that beta-blockers result in a smaller reduction in

cardiovascular events, stroke, and mortality compared to other antihypertensives, the literature highlights their action through multiple mechanisms. These include limiting the effects of excess catecholamines, affecting inotropy and chronotropy, providing antiarrhythmic and anti-ischemic effects, and inhibiting the release of renin (2,3). The mechanism of action of beta-blockers is based on the competitive antagonism of adrenergic receptors and can be divided into three generations: the first generation, characterized by non-selective drugs for beta-adrenergic receptors β1 and β2, represented by propranolol; the second generation, consisting of selective drugs for β1, such as atenolol, bisoprolol, and metoprolol; and finally, the third generation, which includes drugs that can be either selective or non-selective for β1 but may have additional effects such as antagonism at the α-1 receptor or induction of nitric oxide (NO) production, as observed with carvedilol and nebivolol (4). Problems associated with incorrect beta-blocker therapy reported range from risks of bradycardia, atrioventricular block, and symptomatic hypotension, to contraindications in patients with severe asthma due to the possibility of bronchospasm (2). In this context, the role of the clinical pharmacist working in conjunction with the multidisciplinary team is essential to ensure the effectiveness and safety of pharmacological treatment. This can result in reduced mortality rates as well as shortened hospital stays when applied in the hospital setting (5).

Aim

The aim of this study was to conduct a quantitative and qualitative assessment of pharmaceutical interventions, as well as the level of acceptability among other members of the multidisciplinary team, related to beta-blocker therapy in cardiology wards of a philanthropic cardiology reference hospital.

Methods

A cross-sectional retrospective study was conducted, using data collected from pharmaceutical interventions performed by clinical pharmacists and residents of the Multiprofessional Residency Program in Health with a focus on Cardiovascular Care at a philanthropic cardiology reference hospital in João Pessoa. Data were gathered from pharmaceutical care records and notifications of pharmaceutical interventions made between February and July 2023 in pre- and post-operative cardiology wards. The research was approved by the Ethics Committee of Faculdades de Enfermagem Nova Esperança under identification CAAE: 68131822.5.00005179, in accordance with Resolution No. 466 of December 12, 2012, and Resolution No. 510 of April 7, 2016, both from the National Health Council (CNS) of the Ministry of Health. Additionally, the study was conducted following the Code of Ethics for pharmacists as outlined in Resolution CFF 596/2014.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

After analyzing the collected data, a total of 507 pharmaceutical interventions were identified for the period from February to July 2023. The demographic data covered a patient age range from 45 to 76

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

years. Among the analyzed interventions, 7.1% (n=36) were related to beta-blockers, distributed as follows: 2.8% (n=1) for therapeutic duplication intervention; 2.8% (n=1) for partial acceptance of dosage adjustment; 2.8% (n=1) for dosage adjustment intervention; 2.8% (n=1) for addition of treatment; 5.5% (n=2) for partial acceptance of treatment addition; 5.5% (n=2) for treatment addition; 8.4% (n=3) for medication reconciliation interventions; 11.1% (n=4) for dose adjustment; 11.1% (n=4) for unclassified interventions; 22.2% (n=8) for dosage adjustment; and 25% (n=9) for therapeutic substitution. Furthermore, after evaluating the acceptability level of the interventions performed by the multidisciplinary team members, 91.66% (n=33) of the interventions related to beta-blockers were accepted, while only 8.33% (n=3) were not accepted.

Discussion

The clinical roles of pharmacists began with the publication of Resolution No. 585 on August 29, 2013, which also defines Pharmaceutical Interventions as a 'planned, documented professional action performed by the pharmacist, aimed at optimizing pharmacotherapy, promoting, protecting, and recovering health, preventing diseases, and addressing other health problems' (6). Thus, pharmaceutical interventions emerge as an indispensable tool for resolving Drug-Related Problems (DRPs), directly contributing to improved patient outcomes and progress (7). Among the DRPs identified through interventions related to beta-blocker therapy, the highest percentage was associated with therapeutic substitution. Some patients exhibited respiratory issues due to smoking, necessitating the replacement of a non-selective beta-blocker with one from the cardioselective class, due to the risk of bronchospasm. Regarding dosage adjustment, interventions were prompted by the need to modify the pharmaceutical form provided by the hospital pharmacy. For instance, conventional metoprolol tablets were replaced with extended-release tablets of the same drug, making dosage adjustment essential. In this context, it is important to highlight that extended-release tablets maintain therapeutic drug concentrations for longer periods than conventional formulations, which helps avoid excessive concentration peaks in the bloodstream and enhances patient adherence by reducing the number of daily doses (8). Therefore, the lack of intervention regarding dosage adjustment could lead to hypotensive episodes.

The study also demonstrated the relevance of the pharmaceutical interventions performed, as evidenced by a high acceptability rate. Acceptability is closely linked to the recognition and commitment of the clinical pharmacist as a member of the multidisciplinary team, with the professional being capable of studying and proposing therapeutic alternatives based on needs observed during pharmaceutical care, whether through bedside visits or discussions with other healthcare professionals involved in patient care. The results of this study showed that pharmaceutical interventions proved to be valuable tools in preventing, identifying, and resolving DRPs and Drug-Related Needs (DRNs) related to beta-blockers, which can contribute to favorable clinical outcomes for patients. Thus, it reaffirms the importance of the clinical pharmacist in providing comprehensive patient care as an active member of the multidisciplinary healthcare team.

Keywords

Pharmacotherapy; Beta-Blockers; Clinical Pharmacy.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Contribution of Pharmaceutical Care in Patients with Diabetes

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About this scientific work

DOI: 10.62922/4cbffc.cp012
Link: https://doi.org/10.62922/4cbffc.cp012
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Diabetes mellitus is a chronic disease characterized by high blood glucose levels. The central element in understanding its physiology is insulin, a hormone synthesized by the pancreas that facilitates the transfer of glucose from the bloodstream into cells, providing energy and storing it. Thus, changes in insulin production or action lead to persistently elevated blood glucose levels (1). According to global estimates, Brazil will be one of the top five countries with the highest number of people with diabetes aged 20-79 by 2030 and 2045, with 21.5 million and 26 million people, respectively (2). Lifestyle, urban development, demographic changes, and improved quality of life for those with the disease contribute to the incidence and prevalence of cases. Various mechanisms are involved in the development of pathogenesis and the onset of complications, making it a disease with a significant impact on public health, with the potential to progress to severe cases and a complex nature, affecting different aspects of healthcare, individuals, and families (3). Due to the increased morbidity and mortality from non-communicable diseases and the use of pharmacotherapy, it became necessary to expand the

pharmacist's professional responsibilities in patient care (4). Therefore, the pharmacist's role in managing health conditions is crucial in controlling diseases like diabetes through the prevention, identification, and intervention in medication-related problems (5). Studies have explored the role of pharmacists in monitoring diseases like diabetes and implementing educational programs.

Aim

To demonstrate the importance of the pharmacist in assisting patients with diabetes mellitus.

Methods

This study is a narrative review with a qualitative and descriptive approach. The research was conducted in the following steps: 1) formulation of the guiding question; 2) search in primary databases; 3) selection of studies; 4) evaluation of selected studies; 5) discussion of the results. The guiding question for this study was: How can pharmaceutical care optimize the treatment of patients with diabetes? Original articles from the Virtual Health Library, including the LILACS and MEDLINE databases, were selected using the keywords: "pharmaceutical care" AND "insulin" AND "diabetes mellitus." Inclusion criteria included studies in Portuguese, English, and Spanish, published in the last five years (2019-2024), available in full text, and addressing the topic. The selection process involved thoroughly reading the abstracts to determine eligibility based on the guiding question. Subsequently, the eligible studies were read in full, and inclusion criteria were applied, while studies not addressing the guiding question, as well as conference abstracts, were excluded. Five relevant scientific publications were selected based on the established topic.

Results

Silva et al. (2022) identified the following drug therapy problems (DTPs) in patients with type 2 diabetes mellitus (T2DM): medication adherence, monitoring, selection and prescription, ineffective treatment, medication quality issues, adverse drug reactions, pharmaceutical product discrepancies, drug intoxication, and dispensing errors. The pharmacist's interventions included information and counseling, providing materials, monitoring, referral, and pharmacotherapy suggestions, with the most frequent being information and counseling (18%), providing materials (18%), and monitoring (15%) (6). Another study showed that pharmaceutical care significantly improved the quality of life for diabetes patients, with increased medication adherence and encouragement for lifestyle changes through guidance and educational measures, such as promoting physical activity and healthy eating (7). Sherrill et al. (2020) analyzed the role of doctors and pharmacists in implementing glycemic measurement using continuous glucose monitoring technology to optimize its use and resources (8). In this study, changes in hemoglobin A1c (HbA1c) levels were more evident in pharmacist-led visits (1-2 office visits for data interpretation or interventions) compared to doctors who interpreted data once with interventions usually transmitted by phone. Thus, pharmacists' implementation of the method was more effective in improving HbA1c outcomes and optimizing pharmacological interventions.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

Brazil has a large number of people with chronic diseases, with diabetes mellitus being particularly prevalente (1). Therefore, it is not enough for the population to start medication or insulin therapy; health professionals must evaluate the efficacy and results after starting the therapy. The pharmacist plays a crucial role in this context through pharmaceutical care, promoting better diabetes control by implementing pharmaceutical care, investigating dosage, adherence, medication administration, adverse reactions, and drug interactions. This interaction allows patients to understand their treatment and modify habits, such as insulin-dependent patients receiving guidance on proper insulin administration, injection sites, storage, and glucometer use (9). Additionally, pharmacists can perform medication reconciliation to address prescription issues and identify potential DTPs. In this regard, interventions optimize treatment, helping patients improve their clinical conditions. In the information category, health education stands out, whether through conversation, dialogue, or even providing pamphlets and educational materials that help facilitate understanding and adherence to medication therapy (10). In other words, it is necessary to seek different alternatives for understanding and comprehension, aiming to achieve glycemic control and improve patients' quality of life through self-management of the disease. The improvement of clinical conditions was also evaluated through the implementation of a Therapeutic Educational Program (TEP), with follow-up by primary care professionals, mainly community pharmacists, for diabetes patients. With the help of these professionals, it was possible to improve patients' self-management, achieve glycemic control, and make the effects of a hospital educational program more durable, improving clinical outcomes in patients' HbA1c levels, as many could not control diabetes months after the hospital team's intervention. With hospital intervention alone, there was a 44% reduction in HbA1c, but with the active involvement of community pharmacists, the reduction was 57% within 0-12 months (11). Therefore, based on the analyses conducted, it is evident how pharmaceutical care in chronic disease management is explored in the literature. Thus, the pharmacist's contribution to diabetes patients has promoted improvements in clinical conditions and disease management. Therefore, services should expand the integration of these professionals, given the limitations in implementing clinical activities by these professionals.

Keywords

Pharmaceutical Care; Diabetes Mellitus; Insulin.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Measurement of Adherence to Antiretroviral Therapy: Self-Report Instruments Validated in Brazil

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About this scientific work

DOI: 10.62922/4cbffc.cp013
Link: https://doi.org/10.62922/4cbffc.cp013
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Acquired Immunodeficiency Syndrome (AIDS) is a sexually transmitted infection caused by the Human Immunodeficiency Virus (HIV) that interferes with the body's ability to defend itself against infections (1). Almost 40 million people worldwide live with the Human Immunodeficiency Virus (HIV), while it is estimated that, currently, one million people live with HIV in Brazil (2). Despite the evolution of HIV in the last ten years, especially among young people, the development and increased access to antiretroviral treatment have reduced the number of deaths related to Acquired Immunodeficiency Syndrome (AIDS)

from 69% in 2004 to 51% since 2010 (3,4). Thus, adherence to antiretroviral treatment is essential for the impact of public policies on morbidity and mortality to be manifested. Adherence continuously follows the prescribed treatment for the determined period (5). to understand the patterns of therapeutic adherence in specific population groups, it is essential to develop, validate, and apply self-report instruments, since such instruments, in addition to being low cost, allow the identification of factors that improve and worsen adherence (6,7).

Aim

To identify self-report instruments validated in Brazil to measure adherence of HIV-positive individuals using antiretroviral treatment.

Methods

A scoping literature review was carried out based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline (8). The searches took place in September 2023 and the databases included were PUBMED/MEDLINE, SCOPUS, LILACS, EMBASE and WEB OF SCIENCE. The Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH) were used for: self-report, therapeutic adherence, antiretroviral treatment, and Brazil. In addition, boolean operators were also applied. For this review, the research question was: what self-report instruments validated in Brazil are used to measure adherence by HIV-positive individuals using antiretroviral treatment? the inclusion criteria were: (a) studies that used self-report methods validated in Brazil to measure adherence in HIV-positive individuals; (b) studies in Portuguese, English, or Spanish. Literature reviews, editorials, reviews, and letters to the editor were excluded. The identified studies were imported into the Rayyan website, where duplicates were eliminated (9). Two independent reviewers analyzed the studies and disagreements were resolved by a third reviewer.

Results

A total of 120 studies were identified, of which 62 were read in full after applying the eligibility criteria. Of these, 6 were included for data analysis (10-15). In total, 4 self-report instruments for measuring adherence to antiretrovirals in Brazil were identified: Web Adherence Questionnaire (WebAd-Q) (2), formed by 3 items; Cuestionario para la Evaluación de la Adhesión al Tratamiento Antirretroviral (CEAT-VIH) (2), with 20 items; Perceived Barriers to Antiretroviral Therapy Adherence (PEDIA) (1), with 18 items; Self-efficacy expectations of adherence to antiretroviral treatment (SEA-ART) (1), with 21 items. All of these instruments were validated to determine adherence of HIV-positive patients to antiretroviral treatment. Regarding the adherence domains addressed by these instruments, 3 of them (WebAd-Q, SEA-ART, and CEAT-VIH) investigated medication-taking behavior, and 1 (PEDIA) addressed the domains of medication-taking behavior, barriers to adherence, and beliefs related to the health-disease process. Regarding the psychometric properties, test-retest reliability was assessed to the WebAd-Q and PEDIA scales, while internal consistency was assessed for PEDIA, SEA-ART, and CEAT-VIH.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

Several methods are used to measure therapeutic adherence, including self-report instruments, which have different objectives but seek the same result: the WebAd-Q aims to verify the average adherence rates to antiretroviral treatment; the PEDIA analyzes the barriers to therapeutic adherence; the SEA-ART identifies non-adherence; and the CEAT-VIH assesses the degree of treatment adherence (11,16,17). Regarding self-report instruments and the domains in which they fit, the most developed was medication-taking behavior, which is related to the number of doses the patient takes and whether they follow the prescription. The other two domains are adherence barriers, which are related to the factors that prevent the patient from taking the medication; and beliefs associated with adherence, which are associated with the patient's convictions about their treatment (18). All studies analyzed the psychometric properties of the instruments, acquiring knowledge about their validation. Regarding the reliability testing, both test-retest, which assesses the stability of the instrument, and internal consistency, which aims to indicate the homogeneity of the items were analyzed (19). Thus, considering that self-report instruments are widely used due to their ease of application, their validation is essential to ensure the quality and safety of the method and its results.

Keywords

Adherence; Hiv-Positive Individuals; Antiretroviral Treatment.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Challenges of Polypharmacy in Elderly Diabetics: a Literature Review

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About this scientific work

DOI: 10.62922/4cbffc.cp014
Link: https://doi.org/10.62922/4cbffc.cp014
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The elderly population in Brazil has been growing and this aging process contributes to the appearance of chronic diseases, among which diabetes is one of the diseases that most affect this age group (1). The appearance of chronic diseases brings simultaneous and prolonged use of several medications, polypharmacy, which can cause various health complications, such as drug interactions (2). Increased life expectancy can bring numerous challenges such as motor and mental difficulties and increased vulnerability, making this population more sensitive (3). to take care of this risk and age group, the role of the pharmacist in improving adherence and optimizing simultaneous therapies is essential (4). Thus showing the importance of studies on elderly care and the need for new public health policies for this weaker group (5).

Aim

Bibliographical survey of the last 5 years, of articles that talk about polypharmacy in the elderly and diabetic population, showing the importance of pharmaceutical care.

Methods

In this narrative literature review, the SciELO database was used to search for articles. The following scientific health descriptors were used: Polypharmacy, Geriatrics and Pharmaceutical Services. as an inclusion criterion, articles in English and Portuguese, published in the last 5 years, in magazines with Qualis greater than or equal to B3, through the Sucupira Platform, were researched. A total of 25 articles were found and 18 were excluded, as they were not the topic addressed in this review.

Results

The increase in the elderly population in Brazil does not necessarily mean an improvement in quality of life, the growth of this population has brought several social and health demands, intensifying the need to use strategies to address the elderly's difficulties in accessing medicines, low education which decreases understanding of treatment adherence, the use of potentially inappropriate medications prescribed for the elderly contributes to non-adherence to pharmacotherapy (3). In a study carried out in the municipality of Caicó, state of Rio Grande do Norte, Brazil, it used 295 people and the majority consisted of people between 60 and 79 years old, 22% were on polypharmacy for the treatment of Diabetes Mellitus (DM), Systemic Arterial Hypertension (SAH), Generalized Anxiety Disorder (GAD), Gastritis, Heart Failure (HF), Coronary Heart Disease (CAD) aged 80 years or over. The need for more incentives for health promotion, rational prescription of medicines, prevention of health problems and illnesses is identified to achieve healthier and safer aging with a better incidence of polypharmacy (2). In a UBS in the eastern health district of the city of Belo Horizonte, with 227 elderly people aged 60 or over. 70.9% of participants were women, 50.2% of these patients had more than three diseases, polypharmacy was found in 57, 7% of the elderly, excessive polypharmacy 4.8% and only 1.3% of those interviewed used three or more drugs that act on the Central Nervous System. These results show the importance of implementing pharmaceutical care in the search for safer and more optimized use of medicines, ensuring appropriate treatment for the elderly (5).

Discussion

After the data presented, we can emphasize the importance of strategies for the correct use of medications and appropriate and safe prescription. In a study at the Basic Health Unit (UBS) in the city of Alfenas Minas Gerais, it was observed that 32.9% of the elderly were using potentially inappropriate medications (MPI) according to the beer criteria and 27.6% Brazilian Consensus on Potentially Inappropriate Medications Inappropriate for the Elderly (CBMPI), highlighting the need for care in prescriptions that allow greater safety and rationality (6). The increase in polypharmacy is inevitable in this current elderly population and we must ensure adequate pharmacotherapy. The pharmacist plays an important role in healthcare teams, being able to prevent adverse events and drug interactions, playing an important role in education due to complex treatment prescriptions and optimization of drug therapy to improve the quality of life of the elderly (4,7).

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Polypharmacy; Geriatrics; Pharmaceutical Care; Pharmaceutical Services.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Clinical Pharmacist's Role in Managing Patients with Chronic Kidney Disease: a Review

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About this scientific work

DOI: 10.62922/4cbffc.cp015
Link: https://doi.org/10.62922/4cbffc.cp015
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 03/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Chronic Kidney Disease (CKD) is a global health problem characterized by functional and structural changes in the renal system, often manifesting as secondary complications of chronic diseases such as diabetes mellitus and hypertension (1). Due to this, the drug treatment of CKD is multifaceted, which consequently hinders treatment adherence, accelerates disease progression and increases morbidity and mortality rates (2). This condition imposes a significant financial burden on health systems, with high costs related to hospitalizations and specialized care. In this sense, vulnerable populations such as

indigenous people and rural residents have a higher prevalence and severity of the disease (1,3). In addition, these patients have a significantly compromised quality of life due to physical, psychological and social restrictions imposed by treatment. Furthermore, polypharmacy is a common condition among dialysis patients, increasing the risk of drug-related problems and contributing to low therapeutic adherence (2). In this scenario, the pharmacist has an important role in optimizing drug therapy, promoting adherence and preventing adverse events. However, their role is still underutilized in many contexts, especially in relation to the assessment of adherence and the implementation of personalized pharmacological interventions (4).

Aim

The objective of this study is to analyze the importance of the clinical pharmacist's role in the treatment and survival of individuals with chronic kidney disease.

Methods

Bibliographic data was obtained through searches in online journals, PubMed, and Web of Science, using the keywords: "Clinical pharmacy"; "Pharmacist"; "Role of the pharmacist" and "Chronic kidney disease". The keywords were combined using Boolean operators (AND, OR). The selected works, including articles, book chapters, and dissertations, were read to develop the theoretical framework and results of the present research. Due to the large number of articles obtained, the analysis period was set between 2020 and 2024. In addition, other exclusion criteria were established: repeated articles and those that were tangential to the theme.

Results

Based on the established exclusion criteria, of the 63 articles found, after analyzing the title and abstract, only 22 articles fit the theme. Among the main results, we have that the inclusion of the clinical pharmacist in the treatment of patients with CKD resulted in a decrease of 84.23% of cases of adverse drug reactions. The main drugs associated with treatment interference were antibiotics and cardiovascular drugs (5). In another study, the evaluation by the pharmacist was responsible for a 20.5% decrease in 167 cases of drug interactions. In addition to reducing the number of patients with low adherence to treatment from 38.9% to 21.6% (3). Of the 354 problems attributed to medications used by elderly individuals between the ages of 74.9 ± 7.3 years, adverse effects and the administration of unindicated medications were the problems with the highest incidence. Thus, through pharmaceutical intervention, it was possible to improve the quality of drug use in this population group (6). Another point to be addressed would be counseling and teaching about the disease and interpretation of tests, such as renal function tests. This action results in a positive effect on patient adherence to treatment and on the monitoring and self-management of renal health (1,7).

Discussion

Patients with CKD undergo polypharmacy, and changes in prescriptions with each new hospital admission are frequent. This can result in the inadequate use of medications, unwanted interactions,

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

and duplication. Therefore, it is necessary for pharmacists to periodically analyze prescriptions to perform medication reconciliation (8,9). However, limitations related to time and available professionals are one of the main factors that affect the effective participation of pharmacists in the treatment of patients with CKD. Therefore, based on the points addressed in this study, it is possible to affirm the importance of the clinical pharmacist in the management of patients with CKD. With a role not only in resolving problems related to adverse effects or the use of unindicated medications, but also in teaching and sensitizing the patient about the disease, assisting in adherence to treatment.

Keywords

Inflammatory Diseases; Pharmaceutical Care.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Role of Clinical Pharmacy to Prevent Overdose and Underdosage in Pediatrics Hospital Wards

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About this scientific work

DOI: 10.62922/4cbffc.cp016
Link: https://doi.org/10.62922/4cbffc.cp016
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 03/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The pediatric population covers a very broad age range, being subdivided into newborns, infants, preschoolers, schoolchildren and adolescents, as well as a wide range of weight. Consequently, the pharmacist must evaluate patients on a recurring basis in order to ensure correct medication doses for the current weight, since weight is a parameter of acute change in the child's growth (1). Furthermore, the use of different units of measurement is routine, requiring great caution when evaluating the medical prescription, as well as when providing health education to the patient's family members, since the empowerment and engagement of all parts is essential for the safe use of medications. off-label use of medications is defined as the use under conditions other than those indicated in the medication leaflet and, therefore, different from those for which they were registered and approved (2). In pediatrics, off-label prescription is a frequent practice and, consequently, an increased risk of medication errors and adverse reactions are associated (3,4). In this sense, pediatric pharmacotherapeutic monitoring performed by clinical pharmacists during hospitalization contributes to the safety and effectiveness of drug therapy. It is through the evaluation of prescribed pharmacotherapy that it becomes possible to

identify Drug-Related Problems (DRPs) and then perform interventions, aiming to reduce prescription discrepancies in hospitalized patients.

Aim

To present pharmaceutical interventions related to overdose and underdose of medications prescribed in pediatric wards that were performed after evaluating medical prescriptions, suggesting the adequacy of unintentional discrepancies to the medical team.

Methods

A retrospective descriptive study on the profile of pharmaceutical interventions (PIs) focused on underdose and overdose carried out in a 860-bed university hospital in southern Brazil, of which 16.3% of beds are in pediatric wards. This hospital is known as a reference for pediatric and neonatal care. Data was collected from January to May 2024. The PIs were related to therapeutic effectiveness, that is, adjustment of the drug dose due to underdose or overdose according to the indication, weight, renal function, age group, and gestational age. The monitoring of pediatric patients used the Pharmaceutical Bundle (Martinbiancho, 2021), giving rise to the PIs and the signaling to the prescribing team was done through an alert in the electronic prescribing system, by direct contact with the prescriber or by telephone(5).

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

During the study period, a total of 1,132 overdose and underdose PIs were performed throughout the hospital, of which 151 were related to pediatric and neonatal patients, corresponding to 13% of the PIs during the period. Of these, 59% were related to underdose and 41% to overdose. Of this total, 127 were adjusted by the medical team, indicating 84.1% of adherence, as well as corroborating the safe and rational use of medications. The drug classes that had the highest number of interventions were antimicrobials (47%), analgesics (22%), followed by iron and vitamins (16%), while the other drugs were distributed among the different existing classes.

Discussion

Pediatric patients are at increased risk of adverse events, and the practice of off-label and unlicensed use of medications, combined with the wide variety of age groups and weights in Pediatrics, corroborate the importance of the role of the pharmacist in the multidisciplinary team, ensuring the effective and safe use of medications, whether through the identification of possible medication errors, as well as adverse reactions and drug interactions. PIs in medical prescriptions reduce the frequency of adverse events during hospitalization, ensuring safe drug therapy without serious harm to the health of children. In adults, underdosing and overdosing errors are often more apparent, as they involve standardized

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

doses, such as tablets or entire ampoules. Artificial intelligence can be an ally in reviewing prescriptions, but the subtlety of changes in pediatrics and their impact on the outcome of drug therapy as well as the safety of medication use makes pharmaceutical monitoring essential for this population.

Keywords

Pharmacotherapy; Clinical Pharmacy; Pediatrics.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Evaluation of Pharmaceutical Interventions in a Coronary Intensive Care Unit

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About this scientific work

DOI: 10.62922/4cbffc.cp017
Link: https://doi.org/10.62922/4cbffc.cp017
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 03/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The role of the clinical pharmacist in the hospital environment contributes to more effective, safe, and rational pharmacotherapy, reducing medication-related problems (MRPs) and improving patient care. The analysis of medical prescriptions, aligned with pharmaceutical anamnesis, can result in

adjustments, which can be implemented through Pharmaceutical Interventions (PI) (1). These interventions not only improve the quality of drug therapy but also reduce costs for the institution and prevent prolonged hospitalizations that may result from prescription errors or adverse events (3). Given the complexity of treating critically ill patients admitted to the Intensive Care Unit (ICU), a multidisciplinary approach is necessary, in which the clinical pharmacist contributes to the management of pharmacotherapy, minimizing the risk of complications and improving clinical outcomes (2).

Aim

Objective: the objective of this study is to analyze and quantify the pharmaceutical interventions carried out in a Coronary Intensive Care Unit by clinical pharmacists from the Multiprofessional Health Residency at Nova Esperança College (FACENE), from January to December 2023.

Methods

Methodology: This is a retrospective cross-sectional study conducted in a philanthropic hospital specializing in cardiology in João Pessoa-PB. The sample consisted of records of pharmaceutical notifications made from January to December 2023, obtained from the pharmacotherapeutic follow-up of patients in the coronary intensive care unit, conducted by clinical pharmacists from the multiprofessional health residency at Nova Esperança College (FACENE). The research was approved by the Research Ethics Committee of Nova Esperança Nursing Colleges (FACENE) under CAAE: 68131822.5.0000.5179.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

After analyzing the data, 927 pharmaceutical interventions were identified, performed by clinical pharmacists during pharmacotherapeutic monitoring, classified into 20 categories: 29.67% (n=275) addition of treatment, 17.69% (n=164) suspension of treatment; 9.06% (n=84) medication reconciliation; 7.01% (n=65) dose adjustment; 6.04% (n=56) initiation of AGML protocol; 5.83% (n=54) signaling the end of medication; 4.75% (n=44) initiation of VTE protocol; 4.10% (n=38) suggestion for correction of electrolyte disturbances; 3.56% (n=33) treatment substitution; 2.48% (n=23) timing errors; 2.37% (n=22) change of administration route; 1.62% (n=15) infusion time correction; 1.62% (n=15) therapeutic duplication; 1.62% (n=15) inappropriate dosage; 0.86% (n=8) prolonged antibiotic use; 0.54% (n=5) drug interaction; 0.54% (n=5) drug allergy; 0.32% (n=3) antimicrobial escalation; 0.22% (n=2) non-compliance with VTE protocol; and 0.11% (n=1) non-compliance with AGML protocol.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

Among the PIs, the addition of treatment stands out, occurring at various times to optimize antihypertensive pharmacotherapy, but at other times due to the patient's health condition, requiring a new therapeutic approach, such as: initiating a beta-blocker for heart rate control; initiating laxative therapy due to constipation; initiating opioid analgesic in cases of high-intensity pain; and initiating culture-guided antibiotic therapy due to lack of clinical improvement. Treatment suspension is also a crucial intervention, directly impacting pharmacotherapy, as in many cases the patient does not need to use the medication, for example: after postoperative pain cessation; patient on insulin with hypoglycemia; patient presenting allergic reaction; patient on antihypertensive therapy with hypotension; patient able to tolerate oral diet and on parenteral proton pump inhibitor; patient on enoxaparin with severe renal failure. Another highly relevant intervention evidenced in this study was dose adjustment, as patients with renal or hepatic insufficiency may have a reduced capacity to metabolize and eliminate medications; or the dose of some medications is adjusted based on the patient's weight or body surface area; or concomitant diseases such as heart failure, diabetes, or respiratory diseases may affect the pharmacokinetics and pharmacodynamics of a medication, requiring dose adjustments. The fourth most performed intervention in the study was medication reconciliation, aimed at ensuring the continuity of treatment during all care transitions. In this context, the study highlights the importance of the clinical pharmacist's role in intensive care units, ensuring the promotion of rational medication use and the reduction of medication-related problems (MRPs). The clinical pharmacist plays a vital role in identifying critical points, making necessary therapeutic adjustments, and implementing strategies that contribute to patient safety and treatment efficacy, thus demonstrating the relevance of their role in the multidisciplinary health team.

Keywords

Pharmacists; Intensive Care Units; Cardiology.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Clinical Outcomes of the Pharmacotherapy Review Service at a Pharmaceutical Startup

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About this scientific work

DOI: 10.62922/4cbffc.cp018
Link: https://doi.org/10.62922/4cbffc.cp018
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 03/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The prevention, identification and resolution of medication-related problems (MRP) is one of the main pillars of the clinical pharmacist's work. According to the World Health Organization (WHO), more than 50% of medications are prescribed or dispensed inappropriately and half of patients do not use them correctly (1). To ensure quality in health care, it is essential that pharmaceutical services are structured and integrated with other health services, with focus on ensuring availability of medicines, as well as quality and conservation (medication management). Also, it is important for pharmacists to provide care,

focusing on the effectiveness and safety of the therapy: evaluating, obtaining and disseminating information about medicines and health from the perspective of health education and the continuing education of teams (health care management) (2). It is in this context that pharmacotherapeutic review is inserted, a service regulated by the Federal Council of Pharmacy (CFF) (3) and is characterized as a service in which the pharmacist analyzes in a structured way the medications used by the patient, aiming to solve problems related to prescription, therapeutic results, inter alia. In addition, this service can be provided in different ways, such as being focused solely on the analysis of the prescription, or even requiring a direct interaction between pharmacist and patient (3). Although the pharmacotherapy review service is more common in the hospital context, recent data indicate high rates of dispensing and medication errors in community pharmacies (2.4%), which may exceed the hospital average of 1.1% (4). This indicates the importance of the service in these health scenarios that are still underexplored. In the present study, the service presented is part of a pharmaceutical startup that supplies medicines through an adherence device, a "box" with the medicines separated into sachets, by day and time according to the patient's use.

Aim

To describe the demographic and pharmacotherapeutic profile of patients in the pharmacotherapy review service of a pharmaceutical startup and to evaluate the outcomes of the pharmaceutical suggestions made in the journey of these patients.

Methods

This is a retrospective and descriptive study with data from a Brazilian digital community pharmacy (Far.me) whose purpose is the clinical pharmaceutical monitoring of patients, associated with the monthly and individualized dispensing of medications in the Far.me Box, an adherence and safety device, where medications are organized by day, dose and time. Based in Belo Horizonte and São Paulo, it performs the Pharmacotherapy Review service before dispensing medicines and whenever there is any change in the medical prescription. Prescriptions are reviewed through the careful evaluation of Far.me's team of pharmacists, with the help of artificial intelligence (AI) software. This platform was designed to assist professionals in decision-making, through clinical alerts and scores that allow the quick and safe identification of possible problems in the prescription, detection of drug interactions and monitoring of adverse reactions. The data for the study were collected from reports generated by the platform itself, covering the period from January 1, 2024 to June 30, 2024 and processed in the Google Data Studio® software. The pharmaceutical suggestions verified from the analyses were made to the patient and/or guardian remotely, via telephone, letter, e-mail or text message.

Results

A total of 7,266 prescriptions for home-dwelling patients (non-institutionalized) were reviewed during the period analyzed. Regarding the profile, the patients involved have a mean age of 53 years, 66.5% are women, 21.1% live in Minas Gerais and 78.9% in São Paulo. The average number of medications used per person is 3.7. Most patients (57%) use between one and three continuous medications, while 30.7%

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

of people are considered polymedicated, using at least five medications daily. The most common drugs in the pharmacotherapy of the patients are, respectively, quetiapine, losartan, metformin, furosemide, amlodipine, sertraline, and acetylsalicylic acid (ASA). In addition, 25% of new patients had some problem identified in the prescription when they started the contract with the company. In contrast, only 10% of recurring patients at Far.me presented these clinical alerts. The main problems found were related to: convenience: non-optimized schedules (28.6%); effectiveness: drug interaction (20.7%); safety: overdose (16.1%); indication: need for additional medication (8.2%); effectiveness: inadequate dosage (8.0%); indication: duplicity (5.5%); convenience: non-optimized presentation (5.5%); indication: absence of indication (2.7%) and other reasons (4.7%). The drugs most involved in the reported alerts are acetylsalicylic acid (15.8%), levothyroxine (12.9%), vitamin D (6.8%), rosuvastatin (6.2%) and omeprazole (3.4%). Between the pharmaceutical interventions performed, 40% resulted in changes in the patient's pharmacotherapy and another 40% were discussed with the patient and/or prescriber, but no changes were necessary in the medications already used.

Discussion

Most studies on the pharmacotherapy review service are developed with frail or hospitalized patients, which increases the challenges when compared directly with the findings of this study. Nevertheless, it was possible to observe important results. Unlike most of the studies found, in which the average age of those involved exceeds 60 years, in this study the average age was 53 years, a factor that can be explained by the startup's business model in which the profile of patients using continuous medications is not concentrated in the elderly but is also dispersed across other age groups. The predominance of women in the study reinforces the more evident pharmacokinetic and pharmacodynamic changes compared to men, often associated with changes in body weight and hormonal factors. Furthermore, women take better care of their health, using health services more (5). In addition, the study demonstrated a high rate of patients with problems during the first review of pharmacotherapy. However, the pharmaceutical suggestions made with the new patients resulted in a reduction in MRPs throughout the patient's journey. This data reaffirms the need for the service, since when the patient is within the service, many of the problems have already been identified and solved at the beginning. In similar studies (6,7), the MRPs identified are related to the safety and effectiveness of pharmacotherapy. Rogan et al. (6) and Bankes et al. (7) highlight the drug interaction between the MRPs most frequently encountered by pharmacists during reviews of patient pharmacotherapy, as observed in this study. In addition, according to Rogan et al. (6) and Pereira et al. (8), the need for additional medication due to an untreated condition is also important. Other MRPs identified, although in smaller proportions, include therapeutic duplicity, use of medication without indication, low dosage and overdose (6,7,8). Thus, the results obtained show a diversity of problems involved in the pharmacotherapy of patients. The Pharmacotherapy Review service promoted by the institution demonstrated an important contribution to increase the effectiveness and safety of the treatment of patients attended, since most of the pharmaceutical suggestions were accepted or discussed with their physicians, nurses, guardians and patients. Therefore, this service achieves its objectives by identifying MRPs and implementing pharmaceutical suggestions to solve them, also helping to promote rational use of medicines.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Pharmacotherapy Review; Medication-Related Problems; Pharmacotherapy.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Monitoring of Suspected Adverse Events Associated with Zolpidem Use in Brazil

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About this scientific work

DOI: 10.62922/4cbffc.cp019
Link: https://doi.org/10.62922/4cbffc.cp019
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Zolpidem is one of the primary medications used for the short-term treatment of insomnia (1). Its popularity is largely due to its rapid onset of action and short duration of effects (2), making it an attractive alternative to benzodiazepines, which are known for their higher potential to cause tolerance and dependence (3). However, zolpidem has abuse potential and may be associated with adverse effects such as daytime sedation, anterograde amnesia, sleepwalking, and seizures (4). Although studies demonstrate that zolpidem is safe when administered for limited periods under appropriate supervision,

the identification and analysis of reported adverse events are essential for assessing the risks associated with the medication.

Aim

Evaluate the suspected adverse events related to zolpidem that were reported to VigiMed/Anvisa.

Methods

This is a documental, retrospective, descriptive study with a quantitative approach. Data were collected from August 1, 2019, to April 2, 2023, through the pharmacovigilance system of Brazil (VigiMed) on the website of the National Health Surveillance Agency (Anvisa). The studied variables included entry type, notifier type, sex, age group, severity, severity criteria, adverse events by System Organ Class (SOC), and Preferred Term (PT). The study encompassed a total of 230 records of suspected adverse events associated with zolpidem use. Data were described in absolute and relative frequencies using Microsoft Power BI.

Results

A total of 230 reports of suspected adverse events were recorded in the system. The majority of reports involved female patients (n=127; 55.22%). The age group of individuals over 65 years old exhibited the highest prevalence of adverse events related to zolpidem use (n=74; 32.17%). The primary reporters were consumers and non-healthcare professionals (n=124; 53.91%), followed by pharmaceutical companies (n=117; 50.87%). Most of the reported adverse events were classified as severe (n=158; 68.70%). Among these severe events, the majority presented clinically significant effects (n=144; 62.61%). Additionally, some cases resulted in hospitalization or prolonged hospitalization (n=17; 7.39%) and life-threatening situations (n=15; 6.52%). The adverse events most frequently associated with SOC were psychiatric disorders (n=141; 61.30%), general disorders and administration site conditions (n=98; 42.61%), nervous system disorders (n=80; 34.78%), and injuries, poisonings, and procedural complications (n=72; 31.30%). Regarding adverse events classified by PT, the most frequently reported were drug ineffective (n=63; 27.39%), insomnia (n=35; 15.22%), hallucination (n=31; 13.48%), agitation (n=24; 10.43%), and dependence (n=22; 9.57%). In terms of case outcomes, the majority indicated that the patient recovered (n=93; 40.43%), was recovering (n=44; 19.13%), or was in the process of recovery (n=24; 10.43%).

Discussion

Insomnia is more prevalent in women compared to men (5), which may explain the higher usage of zolpidem among women (6). Additionally, women might respond differently to zolpidem treatment than men, due to differences in how the drug is metabolized in the body (7). The pharmacokinetics of zolpidem can be altered in the elderly due to changes in liver and kidney function, leading to increased drug concentrations and a higher risk of adverse effects. Elderly patients taking multiple medications might face a greater risk of drug interactions and adverse events (8). Zolpidem can cause side effects similar to those of benzodiazepines, especially in older adults who are already at higher risk for falls, fractures, and delirium (9). The noticeable increase in public participation in reporting to the system

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

suggests a growing awareness of the risks associated with medications and a more proactive approach in notifying regulatory bodies, highlighting the importance of pharmacovigilance for effective and safe management of pharmaceuticals. Pharmaceutical companies have also played a significant role in reporting, reflecting their responsibility to monitor and address issues related to their products (10). Although zolpidem is generally well tolerated, significant adverse events can occur, such as insomnia, hallucinations, and agitation, reflecting its impact on the central nervous system (11). Therefore, pharmacovigilance is crucial for monitoring the effects of medications within the Brazilian population. Identifying and analyzing zolpidem's effects is essential for ensuring the drug's safety and efficacy, revising usage guidelines, and improving monitoring strategies. In summary, pharmacovigilance is key to protecting public health and continuously enhancing prescription and medication use practices.

Keywords

Pharmacovigilance; Zolpidem; Drug Safety.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Efficiency of Pharmaceutical Care in Reducing Medications in Public Primary Care Clinicspharmaceutical Care Has Emerged as a Crucial Strategy to Optimize Medication Use and Improve Health Outcomes

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About this scientific work

DOI: 10.62922/4cbffc.cp020
Link: https://doi.org/10.62922/4cbffc.cp020
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Pharmaceutical care has emerged as a crucial strategy to optimize medication use and improve health outcomes in Public Primary Care Clinics (Unidades Básicas de Saúde UBS) in Brazil. With the implementation of the National Primary Care Policy in 2017 (Ordonnance No. 2,436), the inclusion of

pharmacist in primary healthcare has become a vital component to promote the rational use of medicines and reduce waste (1). Studies show that the presence of pharmacist can improve the availability of essential medicines, strengthen the rational management of pharmaceutical care, and significantly contribute to the comprehensive of care (2). Carvalho et al. conclude that the presence of pharmacists in primary care services is crucial for the comprehensive of care in SUS (3). However, ongoing efforts are necessary to ensure a more equitable distribution of these professionals and to improve working conditions to maximize the positive impact of pharmaceutical services on the health of the brazilian population. Nevertheless, there are challenges, such as the integration of pharmacists into healthcare teams and the inadequate infrastructure of UBS pharmacies, which need to be addressed in order to maximize the benefits of this care model (4).

Aim

Evaluating the efficiency of pharmaceutical care in reducing the use of medicines in Public Primary Care Clinics, focusing on primary care

Methods

This study adopted a cross-sectional and quantitative analysis. The methodology was developed according to the protocols recommended by PROSPERO for systematic reviews and followed the PICO format (Patients, Intervention, Comparison, and Outcomes). The inclusion criteria included patients attended at UBS during the study period, the implementation of pharmaceutical care in UBS, the comparison with the period before implementation, and outcomes such as the number of prescribed medications, treatment adherence rate and occurrence of shortages. Studies not related to primary care or not providing sufficient data for analysis were excluded. Data collection involved UBS administrative records, structured interviews with healthcare professionals, and a comprehensive literature review using databases such as PubMed, Scielo, and LILACS. Data were independently extracted by two reviewers following a standardized protocol to ensure the consistency and accuracy of the collected information. The main indicators analyzed included the number of prescribed medications, treatment adherence rate, and occurrence of shortages. The data were processed and analyzed using appropriate statistical software, such as SPSS or R. Significance tests, such as Student's t-test and analysis of variance (ANOVA), were applied to assess the differences between the pre- and post-implementation periods of pharmaceutical care. The quality of included studies was assessed using the critical appraisal tool for systematic reviews, such as AMSTAR. Results were synthesized and presented in tables and graphs, highlighting significant differences in medication availability and use before and after the implementation of pharmaceutical care.

Results

The results indicated a significant reduction in the number of prescribed medications at UBS after the implementation of pharmaceutical care, with a 20% decrease in the total volume of acquired medicines. There was an improvement in the availability of essential medications, which increased from 75% to 90%

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

(5). Besides that, patient adherence to treatment increased by 15%, reflecting greater efficiency in medication use. The occurrence of shortages also decreased, from 10 incidents per month to only 2 (6).

Discussion

The integration of pharmacists in primary and dental care at Public Primary Care Clinics (Unidades Básicas de Saúde- UBS) proved highly effective in promoting the rational use of medicines. The presence of a pharmacists not only contributed to reducing the volume of prescribed medications but also improved stock management and patient adherence to treatments (7). These findings corroborate previous studies that highlight the role of pharmacists in the rational management of pharmaceutical care and comprehensive care (8). However, the full implementation of this model still faces challenges, for instance the need for adequate infrastructure and continuous training of healthcare professionals (9). Investments in training and structural improvements are essential to sustain and expand the observed benefits. The experience can serve as a model for other regions, demonstrating that pharmaceutical care is an effective strategy to optimize resource use and improve health outcomes in primary care.

Keywords

Efficiency of Pharmaceutical Care.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Parenteral Nutrition in Neonatal Intensive Care: Aspects of Compatibility with Pharmacotherapy

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About this scientific work

DOI: 10.62922/4cbffc.cp021
Link: https://doi.org/10.62922/4cbffc.cp021
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

During pregnancy, nutrients are supplied to the fetus via the maternal placenta. After birth, enteral nutrition is the first option when there is no neonatal gastrointestinal disorder (1). However, neonates may not be able to tolerate the enteral nutrition due to intestinal immaturity as a result of gastrointestinal prematurity, in these cases, parenteral nutrition (PN) been indicated (2). In addition to PN, another characteristic are typical on critical patients admitted to the neonatal intensive care unit (NICU), as the pattern of polypharmacy prescriptions, where several pharmacological classes are used, which are

predominantly administered intravenously (3). Based on this scenario, the simultaneous administration of PN and intravenous drugs through a single access is possible, and this practice can affect the safety and efficacy of the therapy and nutrition, since PN is a complex mixture where its components can be incompatible with the prescribed drugs, resulting in potential harm to the neonate (4,5,6). Incompatibilities can be caused by physical reactions, which have the potential to promote precipitation, color change and gas production, or chemical reactions, which can generate oxidation, reduction, hydrolysis and decomposition. Thus, these alterations can increase the risk of harm to the pediatric patient, further favoring the occurrence of catheter obstruction, phlebitis or even pulmonary or renal embolism (7).

Aim

This study aims to evaluate the prescription profile of PN in a NICU with regard to its composition and correlate it with the drugs being administered intravenously in order to contribute to the study of potential Drug-PN incompatibilities.

Methods

A cross-sectional study was carried out using medical prescription reports and nursing progress reports found in the Management Application for University Hospitals (AGHU), physical medical prescriptions, and the electronic formulary of Nutritional and Pharmacotherapeutic Follow-up of the patient admitted to the NICU. It was carried out in the NICU of the Januário Cicco Maternity School (MEJC), which is part of the hospital complex of the Federal University of Rio Grande do Norte (UFRN). The sample consisted of patients admitted to the NICU-MEJC who used parenteral nutrition and concomitantly at least one intravenous drug with an infusion time of more than 30 minutes, from April to July 2023. Newborns (< 28 days old) admitted to the NICU who used NP within 5 days of life for at least 3 days between April and July 2023 were included in the study. Newborns (< 28 days old) admitted to the NICU - MEJC who used NP for less than 3 days or started this therapy after 5 days of life in the period from April to July 2023 were excluded from the study. Statistical analysis was carried out through a systematic process using spreadsheets created with the Excel for Windows program. Categorical variables were analyzed using frequency (%), while quantitative variables were expressed using the mean (± SD) and minimum and maximum values, expressed using graphs and tables. This study was submitted to the Ethics and Research Committee of the Januário Cicco Maternity School (CAAE: 64913322.4.0000.0253 and voucher number 125554/2022).

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

The parenteral nutrition prescription was evaluated between the first day of prescription and the day with maximum values. This study shows data by groups of the gestational age (GA) for calorie content, osmolarity, carbohydrates, proteins and lipids. It was possible to obtain the composition in g/L, mEq/L,

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

mmol/L, IU/L and mcg/L of these nutrients in the bags. Carbohydrates, proteins and lipids were prescribed using 50% glucose, 10% aminoped and 20% SMOFlipid, mostly, and/or 20% lipovenus, respectively. Comparing the PN composition of the GA groups, the initial value of the calorie content, osmolarity, volume, carbohydrates, proteins and lipids of NP shows a similar prescription, while the maintenance prescription with maximum values for the components. In relation to electrolytes, there were significant variations especially for the most premature infants. Of the trace elements, only copper exceeded the maximum limit (400 mEq/L).

Discussion

In this study, SMOFlipid 20% was used in more than 80% of the participants, as it derives the advantages of lipids from multiple sources, including medium-chain triglycerides (rapidly metabolized lipids), soybean oil (source of essential fatty acids), olive oil (source of tocopherol and low in phytosterols) and fish oil (anti-inflammatory activity). In one study, IL-6 and IL-8 levels were statistically significantly lower with SMOFlipid 20% compared to soybean oil-based lipid emulsions in a multivariate analysis adjusted for bronchopulmonary dysplasia and infection (8, 9, 10). The drugs used in this study prescribed simultaneously with parenteral nutrition, had an infusion time of more than 30 minutes and and their respective minimum and maximum infusion concentrations has analised. The patients were assessed in terms of the number of venous accesses available, stratified as 1, 2, 3 or 4. In this study, 44 patients used intravenous drugs with an infusion time of more than 30 minutes while using parenteral nutrition, where more than 50% had only one venous access available, 36% had 2, but of these less than half remained with this number for a time equal to or greater than 50% of the use of PN and drugs. Only 4.5% had 3 accesses, but all with a time of less than 50% of the total time of PN and drugs. This study was used Lexicomp ® to assess the compatibility between parenteral nutrition and intravenous drugs prescribed in the NICU - MEJC (11). As described, 20 drugs were assessed for their infusion concentrations and compatibility with 4 parenteral nutrition formulations. Of the drugs, 80% were within the recommended concentrations, 55% were assessed as compatible, 15% had variable compatibility based on the concentration and nutrition used and 10% were incompatible (11). Faced with this scenario, the Brazilian Society of Pediatrics (2023) recommends adopting certain practices. In the absence of data on compatibility or doubt, drugs and PN should be administered through separate catheters; if multiple accesses are impossible, the NP should be interrupted to administer the drugs, with the access being washed before and after administering the drug; and whenever drugs are infused with NP, they should be strictly monitored for signs of incompatibility, such as precipitation, color change, signs of obstruction (12).

Keywords

Parenteral Nutrition; Incompatibility; Intravenous Drugs.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Safe and Optimized Therapy: Characterization of Clinical Pharmacy Interventions in a Hospice Unit in Southern Brazil

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About this scientific work

DOI: 10.62922/4cbffc.cp022
Link: https://doi.org/10.62922/4cbffc.cp022
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

In recent years, healthcare institutions have become increasingly concerned with patient safety and the quality of care. In response, preventive measures have been implemented in the healthcare system, such as the detection and prevention of medication errors (1). In the context of palliative care, this type of care aims to improve the quality of life for patients in their final stages, as well as for their families, by managing pain and other signs and symptoms such as nausea, vomiting, and infections caused by microorganisms, while also addressing psychological, social, and spiritual issues. The pharmacist, together with the multidisciplinary team, seeks to optimize prescriptions by considering the patient's pharmacological treatment needs at that moment (2).

Aim

Objective: to evaluate pharmaceutical interventions carried out over a period of five months in a small Hospice unit in southern Brazil.

Methods

Method: Through the hospital software used in the institution, the pharmaceutical interventions were tabulated in Excel spreadsheets and subsequently categorized according to classification and acceptability by the medical team.

Results

A total of 985 interventions were carried out between March and July 2024, with a 98% acceptance rate by the prescribing physicians. Of the total, 29% (n = 286) were related to the addition of medications for the control of signs and symptoms, 17.5% (n = 173) were related to the discontinuation of use due to therapeutic futility during the hospitalization process, 10.9% (n = 107) were related to medication reconciliation at the time of admission, 9.5% (n = 93) concerned the route of administration given the loss of oral intake at the end of life, and finally, 7.5% (n = 74) were dose adjustment suggestions related to renal and hepatic dysfunction. Additionally, 25.6% (n = 252) reflected other types of interventions carried out in the care of palliative patients.

Discussion

During all care transitions, patients should be assisted to ensure medication safety. In the context of palliative care, the clinical pharmacist plays an essential role alongside the prescriber in the addition and discontinuation of medications during hospitalization, with the goal of symptom control and deprescription of therapeutic futility, aiming for patient comfort and safety. In most cases, patients receiving exclusive palliative care are subject to polypharmacy and present various symptoms as a consequence of disease progression, such as pain, nausea, gastrointestinal disorders, delirium, and dyspnea, which are minimized with appropriate therapy, including non-opioid analgesics, opioid analgesics, antiemetics, laxatives, constipants, and antipsychotics. The lack of pharmaceutical follow-up for these patients during hospitalization increases the risk of potential unintentional discrepancies caused by communication errors. Additionally, the pharmacist collaborates with the prescriber by offering suggestions to optimize therapy and directs the prescription profile towards more complete and assertive care for the patient.

Keywords

Clinical Pharmacy; Palliative Care; Prescription.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Analysis of Self-Medication and Irrational Use of Medications in São Carlos, SP

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About this scientific work

DOI: 10.62922/4cbffc.cp023
Link: https://doi.org/10.62922/4cbffc.cp023
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

According to the National Health Surveillance Agency (ANVISA), a medication is any pharmaceutical product intended to relieve symptoms, cure diseases, or for diagnostic purposes1 . Similarly, the World Health Organization (WHO) defines rational drug use as the appropriate use of medications based on a patient's clinical needs, with the correct dosage and duration, at the lowest possible cost2. However, this ideal is challenged by the difficulties associated with rational drug use, which has become a global concern. Compounding this issue is self-medication, where patients independently use pharmaceutical products without a professional prescription, aiming to quickly alleviate symptoms or treat conditions without consulting healthcare services3. This practice raises serious concerns due to the easy availability of medications and the potential risks involved, particularly with over-the-counter (OTC) drugs and non-prescription medications.
There are several ways to reduce self-medication among patients. However, one of the most crucial approaches is the involvement of pharmacists. as accessible health professionals, pharmacists can guide the public on proper medication practices. Various factors contribute to self-medication and irrational drug use. However, there is still limited understanding of the traits of populations engaging in

these practices and the profile of self-medication among local inhabitants. This study aimed to analyze population data from the municipality of São Carlos, SP, in relation to self-medication practices and irrational drug use, identify associated factors, and underscore the importance of pharmacists in prevention. The study also aimed to provide guidelines for implementing health education programs to reduce public health costs and improve quality of life.

Aim

The aim of this study is to evaluate the prevalence and determinants of self-medication and irrational drug use among the population of São Carlos, identify the most commonly utilized medications, and assess associated risks. Additionally, to delineate the role of pharmacists in mitigating these issues and to develop and propose health education strategies designed to promote the safe and responsible use of pharmaceuticals.

Methods

The methodology employed in this study was a cross-sectional design aimed at examining the factors involved in self-medication and irrational drug use among the population of São Carlos, São Paulo, Brazil. This research is both exploratory and descriptive, utilizing both quantitative and qualitative approaches through interviews and field surveys based on a structured questionnaire. To gain a deeper understanding of the central topic of this study, an extensive bibliographic research was conducted across various databases, including Scielo, Google Scholar, and PubMed. This approach was chosen due to the availability of reliable and relevant content, providing a solid foundation for the analysis. The literature review examined key concepts such as self-medication, irrational drug use, pharmaceutical care, and the role of pharmacists. It aimed to provide a comprehensive view of these topics by including literature published from 2010 onwards in both Portuguese and English. Although the focus was on recent publications, relevant older materials were also considered. After the literature review, primary data was collected using a structured questionnaire administered in August 2023 via Google forms. The survey link was shared through social media platforms such as WhatsApp, Instagram, and Facebook. The questionnaire was organized into three sections: (i) sociodemographic information (gender, age, education level); (ii) self-medication (prevalence and types of medications commonly used); and (iii) aspects related to self-medication (previous prescriptions, encouragement from others, and reasons for self-medication).

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

A total of 165 responses were analyzed. Regarding sociodemographic data, it is observed that the majority of participants were women, representing 70.3% (n=116), while men comprised 29.7% (n=49). Upon inquiring about self-medication practices, 155 participants reported self-medicating, which represents 93.9% of the total. Five participants indicated that they had never self-medicated,

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

representing 3%, while another five answered "maybe," also accounting for 3% of the total. When questioned about the presence of any health conditions, the majority of participants reported no pathological conditions. Among the reported conditions, depression had the highest prevalence at 5.5%, followed by asthma at 4.8%, hypertension and hypercholesterolemia at 4.2% each, and gastrointestinal disorders at 3.6%. Regarding the probable reasons for participants engaging in self-medication without professional supervision, the primary factors identified are: prior experience with similar symptoms and familiarity with suitable medication (84.2%), time limitations (29.1%), the need for quick symptom relief (24.8%), and barriers to accessing medical care (22.4%). Among the participants, the most commonly used medications include analgesics (63.6%), followed by nonsteroidal anti-inflammatory drugs (NSAIDs) (53.3%), antihistamines (40%), nasal decongestants (24.2%), cough syrups and hormonal contraceptives (20%), with antidepressants (10.3%) and corticosteroids (9.7%) also reported. Regarding the indications for medication use, headache was identified as the most common cause, reported by 77.6% of participants. This was followed by muscular pain (52.7%), Regarding professional consultation, 87.3% of participants sought advice from pharmacists or pharmacy assistants, while 12.7% did not. Concerning adverse effects from self-medication, 73.9% reported no negative reactions, 16.4% experienced adverse effects, and 9.7% were unsure about the presence of such effects.

Discussion

The results indicate a notably high rate of self-medication at 93.9% among participants, which contrasts sharply with the national prevalence of 16.1% reported in the 2016 National Survey on Access, Utilization, and Promotion of Rational Use of Medicines (PNAUM). This substantial discrepancy suggests a need for an in-depth analysis of the specific socioeconomic, demographic, and cultural factors within the municipality. It also raises important public health implications. Understanding the underlying drivers of such high self-medication rates and addressing potential gaps in health information and education are essential. Studies reveal a higher prevalence of self-medication among women, particularly those aged 18 to 36, as evidenced by Bertoldi et al. (2004)4. This pattern is associated with women's increased health concerns and more frequent use of medical services. Women also commonly experience headaches, muscular pain, and chronic conditions such as migraines, often resorting to analgesics and muscle relaxants from a young age to manage menstrual discomfort, as noted by Rueda (2013)5. These factors contribute to the observed self-medication patterns and underscore the need for tailored preventive and educational strategies to promote safe and effective health practices, especially for women. The pronounced prevalence of analgesic use in self-medication can be understood through the lens of the high incidence of pain within the general population, as highlighted by Carrera-Lasfuentes (2013)6. Pain, often resulting from factors such as muscle tension, stress, or physical exertion, significantly affects individuals' quality of life, driving a pursuit for symptomatic relief. Additionally, the appeal of nonsteroidal anti-inflammatory drugs (NSAIDs) in self-medication is due to their comprehensive effects, which include analgesic, antipyretic, and anti-inflammatory properties. The ready availability of these medications, many of which can be purchased without a prescription, likely enhances their popularity for self-medication purposes. In the context of self-medication complaints, headaches emerge as a prominent factor. They are frequently cited as a reason for self-medication, as shown by Tarley et al. (2018)7, who found that 86.7% of participants used medications without medical

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

guidance to relieve headache pain. This consistent pattern highlights headaches as a significant motivator for self-medication, though it is important to recognize that they can have various underlying causes. Self-medication for headaches raises critical issues about proper symptom management, contributing factors, and the need for targeted preventive and educational strategies, especially given the widespread use of over-the-counter analgesics and the pursuit of immediate relief. In a study on self-medication among otorhinolaryngology patients, Servidoni et al. (2006)8 found that 72% of participants sought advice from pharmacists or pharmacy assistants, with 56% receiving recommendations directly at the pharmacy. The alignment of these results with the current study highlights a consistent pattern of seeking pharmaceutical advice in self-medication practices. This underscores the crucial role that pharmacy assistants play, who are often consulted before seeing medical professionals. The frequent need for their recommendations underscores the importance of comprehensive training and supervision to ensure safe and informed self-medication.

Keywords

Self-Medication; Irrational Use; Pharmaceutical Education.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Main Pharmaceutical Interventions Related to Antimicrobialpharmacological Treatment

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About this scientific work

DOI: 10.62922/4cbffc.cp024
Link: https://doi.org/10.62922/4cbffc.cp024
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Research directed at the length of hospital stay for patients in a hospital setting demonstrates antimicrobial pharmacotherapy as a widely used care option, both for prophylactic and clinical treatment, especially due to the complexity of cases and the high risk of healthcare-associated infections. However, antimicrobial resistance (AMR) is a critical issue in global public health, making

infection treatment more difficult and increasing mortality rates (1). Therefore, the safe prescription and use of this class promote good clinical progress, control of resistant bacteria and fungi, and reduction of healthcare costs. In this context, the clinical pharmacist plays a vital role in managing antimicrobial therapy, improving treatment efficacy and reducing the incidence of adverse effects (2,3) through various interventions such as suspension of therapy due to renal impairment, switching antimicrobials based on resistance cultures, among others, to minimize AMR and optimize clinical outcomes (4).

Aim

This study aims to analyze the main pharmaceutical interventions performed in a philanthropic hospital in João Pessoa-PB, during the pharmacotherapeutic monitoring of patients using antimicrobials.

Methods

This is an observational, analytical cross-sectional study conducted in a philanthropic cardiology reference hospital in the municipality of João Pessoa-PB. The sample consisted of 2477 records of pharmaceutical notifications from the Clinical Pharmacy service of the said hospital, from January to December 2023, which contained pharmaceutical interventions performed by clinical pharmacists of the Multiprofessional Hospital Health Residency at Nova Esperança Colleges (FACENE), during the pharmacotherapeutic monitoring of patients using antimicrobials in cardiology wards and Intensive Care Units (ICU). Inclusion criteria were patients over 18 years of age who had pharmacotherapeutic follow-up during hospitalization. Patients who received pharmacotherapeutic follow-up outside the period from January to December 2023 were excluded. This research followed the Code of Ethics for pharmacists according to CFF Resolution 724/2022 and was approved by the Ethics Committee in Research of Nova Esperança Nursing Colleges (FACENE) under CAAE: 68131822.5.0000.5179.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

After data analysis, 2477 pharmaceutical interventions were identified during pharmacotherapeutic follow-up. Of this total, 2.74% (n=68) of interventions corresponded to antimicrobial treatment in cardiology wards and ICUs. Four intervention profiles were identified: adjustments in antimicrobial infusion time, dosage adjustments due to renal impairment, switching antimicrobials guided by culture, and suspension of therapy in patients with renal impairment. The most performed intervention was the adjustment of antimicrobial infusion time, accounting for 42.64% (n=29), highlighting the importance and positive impact that infusion time can have on therapeutic efficacy. The second most performed intervention was dosage adjustment due to renal impairment, accounting for 32.35% (n=22) of interventions, emphasizing its importance to avoid toxicity and ensure effective therapeutic doses. The third most performed intervention was switching antimicrobials based on microbiological culture results, totaling 23.52% (n=16), relevant for rational use and higher chances of therapeutic success.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Finally, the suspension of therapy in patients with renal impairment accounted for 2% (n=1), although crucial to prevent further harm, the low percentage suggests possible underutilization of this practice.

Discussion

The need to adjust the infusion time of antimicrobials is crucial to optimize therapeutic efficacy and reduce the development of bacterial resistance, especially for time-dependent antimicrobials. Modification of the infusion duration of these medications constitutes a critical pharmaceutical intervention, as seen with beta-lactams (including penicillins, cephalosporins, and carbapenems). These therapeutic agents demonstrate greater efficacy when their plasma concentrations are maintained above the minimum inhibitory concentration (MIC) for a prolonged period (5). Besides adjusting infusion times, it is equally essential to adjust drug doses in patients with renal impairment to prevent toxicity and ensure therapeutic efficacy. Renal impairment, including chronic kidney disease (CKD) and acute kidney injury (AKI), can significantly alter the pharmacokinetics and pharmacodynamics of medications, leading to subtherapeutic effects or increased toxicity risks. Renal dysfunction can interfere with the elimination of active drug metabolites, resulting in potential accumulation. Furthermore, altered renal function can impact dosing intervals of renally excreted drugs (6), and in cases of renal dysfunction (which was the criterion for the fourth most performed pharmaceutical intervention in the study), interruption of antimicrobial administration may be necessary due to the reduced renal capacity to excrete these drugs. This reduction in renal function can lead to drug accumulation in the body, increasing the risk of toxicity and adverse effects (7). In this context, the role of the clinical pharmacist is essential, as it allows the implementation of precise, evidence-based interventions. Additionally, antimicrobial culture also plays a vital role in infection management, as it is an essential laboratory test that identifies the organism responsible for an infection and its sensitivity to different antibiotics. Rapid detection of specific resistance mechanisms is crucial to guide effective and targeted antimicrobial therapy, allowing for a swift therapeutic approach that directly combats identified resistance mechanisms (8). Thus, the results of this study highlight the importance of the clinical pharmacist in optimizing pharmacotherapy. The clinical pharmacist's role, aligned with best practices and available evidence, is essential to improve clinical outcomes. The adoption of rigorous, evidence-based protocols conducted by clinical pharmacists can not only reduce mortality but also combat the spread of antimicrobial resistance (AMR).

Keywords

Antibacterials; Cardiology; Pharmacists; Clinical Pharmacy.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmaceutical Interventions and Vancomycin Monitoring in Adult ICU Patients: Insights From a Southern Brazilian University Hospital

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About this scientific work

DOI: 10.62922/4cbffc.cp025
Link: https://doi.org/10.62922/4cbffc.cp025
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Antibiotic stewardship programs can significantly improve the use of antibiotics, resulting in better patient outcomes. These programs can reduce antibiotic resistance rates, treatment failures, adverse effects, hospital costs, and lengths of stay (1,2). as part of various antibiotic management actions, the pharmacist performs therapeutic drug monitoring to enhance the effectiveness and safety of pharmacotherapy. Analyzing serum drug concentrations can individually customize dosages, thereby

optimizing clinical outcomes (3,4). This monitoring should prioritize antibiotics reserved for multidrug-resistant microorganism infections. In this context, vancomycin, an intravenous glycopeptide antibiotic, treats invasive gram-positive severe infections, including methicillin-resistant Staphylococcus aureus (MRSA) (5). Due to the significant serum concentration variability with the same vancomycin dose regimens, therapeutic monitoring should be conducted to determine necessary dose adjustments. Therapeutic monitoring is recommended for all patients treated with vancomycin for longer than 48 hours to avoid under-dosing or to minimize the risk of toxicity, especially in patients with obesity, on renal replacement therapy, with unstable kidney function, or critical illness (6). The minimum serum concentration (trough) should be obtained at steady-state conditions 30-60 minutes before the fourth or fifth dose for patients with normal renal function (7). to improve tissue penetration and clinical outcomes, optimal vancomycin serum trough concentrations for complicated infections should be 15-20 mcg/mL, and for central nervous system (CNS) infections, 20-30 mcg/mL (5).

Aim

This study aimed to assess data on therapeutic monitoring of vancomycin and pharmaceutical interventions for vancomycin dose adjustments in patients admitted to the intensive care unit (ICU) at a university hospital.

Methods

A retrospective cross-sectional study was conducted in a public university hospital (180 beds for clinical and surgical care and 40 ICU beds) in a southern Brazil municipality. The hospital pharmacy service provides therapeutic monitoring of vancomycin. Based on patient serum results, pharmacists implement interventions to adjust the dosage following the institution's guidelines for vancomycin administration. The study included adult patients (≥18 years) of both sexes admitted to the ICU who received an intravenous infusion of vancomycin during the data collection period. Patients who died during treatment were excluded. Data were collected in the clinical pharmacy service's files and patients' medical records for 13 months (January 2019 to January 2020). The specific form developed for this study was processed in Microsoft office Excel® (Microsoft, USA). For this study, the following variables were collected: age, sex, period admitted to the ICU, vancomycin treatment (start date, time, duration, indication), diagnosis of patients, and serum creatinine levels. For vancomycin-induced nephrotoxicity analysis, renal function was assessed at the beginning and end of treatment (8). Creatine clearance was calculated using the CKD-EPI Equation for Glomerular Filtration Rate (GFR), considering GFR <60mL/min/1.73m2 indicative of renal impairment (9). The vancomycin therapeutic targets were considered according to the institution's guidelines for vancomycin [20-30 mcg/mL for CNS infections and 15-20 mcg/mL for complicated infections] (5). The findings were summarized and reported using simple and relative frequencies. This research was conducted following the Declaration of Helsinki and was approved by the State University of Ponta Grossa Human Research Ethics Committee (approval number: 4.115.054/2020).

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Ethics
The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

36 patients were included (mean 58.7±15 years, men 75.0%), with an average ICU stay of 21.6±12.5 days. The average duration of vancomycin treatment was 7±4.3 days. Bacterial cultures were performed for all patients. MRSA was isolated in 18% (9) of the 50 positive cultures. The main indications for vancomycin were MRSA infection (22.2%; 8/36), pulmonary sepsis (16.7%; 6/36), and meningitis (16.7%; 6/36). In total, 109 vancomycin therapeutic monitoring tests were performed (average 3/patient, range 5-75 mcg/mL). Of these, 27 (24.8%) were conducted for eight patients with CNS infections. 26% (7/27) showed serum vancomycin concentration lower the reference value at peak (<20 mcg/mL), above the reference value at peak 44.5% (12/27) (>30 mcg/mL) and 29.6% (8/27) at therapeutic target (range 20-30 mcg/mL). Among non-CNS complicated infections, 75.2% (82/109) of the therapeutic monitoring of vancomycin, 20.8% (17/82) showed serum concentration lower the reference value (20 mcg/mL) and 42.6% (35/82) at therapeutic target (range 15-20 mcg/mL). The creatinine clearance value ranged from 8.7 to 187.8 mL/min/1.73m2. Of the patients included, 66.7% (24/36) did not have prior renal impairment before starting vancomycin treatment. However, 12.5% (3/24) showed a reduction in GFR after starting treatment. Vancomycin concentrations in patients without prior renal impairment were above the therapeutic target (>40 mcg/mL; max. 75 mcg/mL). 97 pharmaceutical interventions were performed. Most of them, 59 (60.8%), involved vancomycin dose adjustments based on serum concentration [27 (27.9%) dose increase or dose interval reduction, and 32 (32.9%) dose reduction or suspension]. The other 38 interventions (39.2%) were related to appropriate timing for blood sample collection. Most interventions, 80.4% (78/97), were accepted, 1% (2/97) were not accepted, and acceptance information was not available for 17.5% (17/97).

Discussion

Our study demonstrated that pharmaceutical interventions to optimize the use of vancomycin in ICU patients were widely accepted. Pharmaceutical interventions were crucial for adjusting vancomycin dosage regimens. Through the guidance and adjustments provided, vancomycin serum levels were corrected to reach the appropriate therapeutic range, ensuring the optimization of therapeutic doses of this antibiotic and preventing adverse or toxic events and potential treatment failures that could worsen the patient's clinical condition. Vancomycin levels below the appropriate therapeutic range can lead to the emergence of resistant bacterial strains and ineffective treatment, while levels above the therapeutic target can cause nephrotoxicity and unwanted adverse reactions (9). In this study, MRSA was not the most frequently isolated microorganism. In a retrospective cross-sectional study, MRSA was isolated in 24.1% of 29 positive cultures, a similar result to the present study (10). However, MRSA infection was the main indication for treatment with vancomycin. Staphylococcus aureus is recognized for its substantial clinical relevance, owing to its significant pathogenicity and adaptability, and is a leading cause of both hospital and community-acquired infections. Methicillin-resistant Staphylococcus aureus (MRSA) accounts for 25 to 50% of S. aureus infections in hospital settings and is associated with high morbidity

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

and mortality rates, exhibiting resistance to all penicillins and most other β-lactam antibiotics (11). Vancomycin holds considerable clinical importance, being effective against MRSA infections with good tissue penetration (13). However, this antibiotic has nephrotoxicity potential and a narrow therapeutic window. This was demonstrated by the fact that 12.5% of the studied patients experienced a deterioration in glomerular filtration rate (GFR) after starting treatment. For one patient who exhibited a significant decrease in GFR following vancomycin use, all recorded vancomycin levels were above the therapeutic target, with the patient having the highest observed serum concentration (75 µg/mL). For other patients who also experienced a decline in GFR, most vancomycin levels were higher than 40 µg/mL. This may indicate acute kidney injury (AKI) caused by vancomycin use (8). A study by Zamoner et al. demonstrated that vancomycin levels are an important predictor of nephrotoxic AKI in critically ill patients, with a prevalence of AKI in the study's patients being 44.4%, occurring on average on the 6th day of vancomycin use (12). Therefore, monitoring and measuring serum vancomycin levels can help prevent toxicity and maintain appropriate therapeutic serum concentrations, avoiding inadequate tissue penetration or ineffective infection control (9,13). Our findings corroborate other studies that demonstrate the high acceptance rate of pharmaceutical interventions, highlighting the importance of these professionals in preventing medication errors, controlling hospital infections, and reducing costs, thereby improving outcomes related to pharmacotherapy (13,14).

Keywords

Pharmacists; Clinical Pharmacy Information Systems.

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DOI: 10.62922/4cbffc
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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Analysis of Adverse Drug Reactions in a Public Hospital with High Neurological and Cardiological Complexity in Paraíba/PB

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About this scientific work

DOI: 10.62922/4cbffc.cp026
Link: https://doi.org/10.62922/4cbffc.cp026
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Pharmacovigilance, according to the World Health Organization (WHO), is defined as the science and activities related to the identification, evaluation, understanding and prevention of adverse effects or any problems related to the use of medicines. It aims at sustaining that the benefits of drug therapy outweigh the associated risks. (1). Pharmacovigilance competencies are not limited to the investigation and treatment of adverse drug reactions (ADRs), classified as all harmful or undesirable responses, unintentional after the administration of drugs in doses and frequencies usually used for prophylaxis,

treatment or diagnosis of a disease or to alter a biological function in humans (2). Other drug complications such as quality deviation, therapeutic ineffectiveness, medication errors, off-label use, intoxication and drug interactions are also covered by pharmacovigilance, which plays an essential role in improving safety in the medication chain and patient safety. and in public health (3). Clinical pharmacy, in turn, is characterized as “a pharmaceutical area focused on the science and practice of rational use of medicines, in which pharmacists provide patient care, with the purpose of optimizing pharmacotherapy, promoting health and well-being and preventing diseases" carries out pharmacovigilance actions such as the identification and treatment of ADRs that bring direct benefits to patients being monitored, to the institution and to other national and international health services (4)

Aim

Analyze the ADR profile among the pharmacovigilance actions implemented by the Clinical Pharmacy Service of the Hospital Metropolitano Dom José Maria Pires, a state reference hospital of high neurological and cardiological complexity in the period from 09/2022 to 07/2024.

Methods

This is a descriptive, cross-sectional and retrospective study, carried out by the clinical pharmacy team of a reference public hospital for cardiovascular and neurological care of patients in SUS in the state of Paraíba. The study was approved by the hospital's Research Ethics Committee, under the report number 6457734. The Informed Consent form was waived since this was a data review study. The research was developed through the analysis of ADRs that occurred between the months of September of 2022 and July of 2024. The data used for analysis were: sex; age; severity; causality; related drugs; type of reaction and type of notification. The data were collected and transcribed into an electronic spreadsheet for analysis. The data obtained were gathered in a database (Excel®) for better visualization and analysis. ADRs were classified according to the Naranjo algorithm for causality (defined, likely, possible, doubtful) and according to the WHO for severity (mild, moderate, severe, fatal). The Naranjo algorithm is the most commonly used to determine the causality of an adverse drug event (5). The Naranjo algorithm consists of ten questions, the answers to which are objective, with two options (yes or no). Points are assigned to each answer, and by adding them together, it is possible to classify ADRs into probability categories. as for severity, it is classified by degree: Mild (Level 1), where the administration of an antagonist is not necessary and it does not require hospitalization; Moderate (Level 2), where it requires a change in the drug used in therapy, specific treatment or an increase in hospitalization time for at least one day; Severe (Levels 3 and 4), High potential for life-threatening, permanent damage or requires urgent intensive medical treatment or procedures and Lethal (Level 5): Contributes directly or indirectly to the patient's death.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Results

In the period between 09/2022 and 07/2024, 45 ADRs were identified. ADRs were more frequent in males (53.3%) when compared to females (46.7%).Regarding age, it can be observed that the adverse reactions reported occurred in children, young people, adults and the elderly, where 46.7% patients were between 18 and 60 years old; 44.4% patients over 60 years old; 4.4% in patients from 2 to 12 years old; 2.2% in patients between 0 and 2 years old and 2.2% in patients between 12 and 18 years old. The drugs associated with ADRs were: Vancomycin (35.6%), Polymyxin B (20%), Dipirone (6.7%), Enoxaparin/ Acetylsalicylic acid (Aspirin) /Clopidogrel (4.4%), Phenytoin (4.4%), Magnesium Sulfate (4.4%), Aspirin/Clopidogrel (4.4%), and with less incidence: Amiodarone, Clindamycin, Linezolid, (Rifampicin+Isoniazid+Pyrazinamide+ Ethambutol), Tranexamic acid, Bromopride, Cefepime/ Teicoplanin, Meropenem and Piperacillin + Tazobactam, with only one reaction reported for each (2.2%). Regarding the type of ADR reported, it can be observed: skin rash (26.7%), infusion reaction (8.9%), hemorrhage (8.9%), bronchospasm (6.7%), nephrotoxicity (6.7%), diarrhea (6.7%), hypotension (4.4%), Steven Johnson syndrome (4.4%), generalized pruritus and paresthesia (4.4%), man syndrome red (2.2%), pruritus and nausea (2.2%), dyspnea and facial cyanosis (2.2%), periorbital eyelid edema (2.2%), myelotoxicity/leukopenia and thrombocytopenia (2.2%), skin rash and hyperpigmentation (2.2%), septate cerebral ventricle (2.2%), dyskinesia (2.2%), nausea, vomiting and paresthesia (2.2%). Regarding the type of notification: 65.2% corresponded to underreporting, while spontaneous notifications represented 34.8%. Regarding the assessment of the severity of ADRs, the reported reactions were classified as moderate (55,6%), severe (40%) and mild (4.4%). There were no cases of death as a result of an ADR. In the causality assessment, it was observed that ADRs were classified as possible (84.4%) and probable (15.6%).

Discussion

In all cases, an investigation was conducted regarding the dosage, infusion time, weight, and renal function. In some cases, especially involving the antibiotics vancomycin and polymyxin B, it was not possible to guarantee that the administration followed the dilution pattern and infusion time recommended in the prescription. In one case of an infusion reaction associated with polymyxin B in the infirmary, it was identified that the dilution was not prescribed, posing a risk of incorrect dilution administration. Among the factors predisposing to ADRs is polypharmacy, as it increases the likelihood of drug interactions. All observed patients were polypharmacy, contributing to the occurrence of ADRs, as seen in cases involving bleeding associated with the concomitant administration of aspirin, clopidogrel, and enoxaparin, and only aspirin and clopidogrel in patients requiring dual antiplatelet therapy with prophylactic or therapeutic indication for enoxaparin use. Elderly patients are susceptible to polypharmacy therapies, which increases the risk of developing serious adverse events (6)(7). It was noted that the most reported drug was vancomycin (35.6%). Two cases were detected where the prescribed dosage was higher than recommended given the patient's renal function (creatinine clearance). The main reactions caused by vancomycin described in the literature are: nephrotoxicity, ototoxicity, red man syndrome, allergic reactions and hepatotoxicity (8) (9). The antimicrobial polymyxin B, the second most reported drug (20%), has several reported cases of ADRs related to neurotoxic

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

symptoms. After infusion of the antimicrobial, patients experience peripheral paresthesia, dizziness and numbness of the extremities (10). Among the ADRs observed in the study, the incidence of paresthesia in a patient with renal dysfunction (intravenously), skin hyperpigmentation (intravenously) and septate ventricle/meningismus (intrathecally) stands out. According to our study, the types of reactions most reported were those with greater visibility, such as cutaneous reactions, whose classification regarding severity was mostly serious. Skin rash, erythema and pruritus were the most cited cutaneous symptoms (11). There are likely other cases of ADRs that were not reported in the hospital. This underreporting often occurs due to a lack of information among the care team or fear of punishment or retaliation (12). to reduce underreporting, the clinical pharmacy team provided training in the sectors to raise awareness among the teams about the importance of spontaneous reporting, in addition to implementing work instructions and routines for actively searching for ADRs. The routine consists of actively searching for prescribed trigger medications that are used as treatment for ADRs (antidiarrheals, anti hemorrhagic, antihistamines, benzodiazepine and opioids antagonists), evaluating the multidisciplinary team's progress notes, and conducting multidisciplinary visits. It is observed that with the implementation of the Clinical Pharmacy service, the number of ADR notifications increased significantly, going from 1 notification in 2022 (September to December), to 20 notifications in 2023 and 24 notifications in 2024 (January to July). The Service's actions to mitigate underreporting and the incidence of ADRs are training for care teams with greater dissemination of technical manuals to increase safety in the use of medications in the institution.

Keywords

Adverse Drug Reaction; Clinical Pharmacy; Pharmacist; Pharmacovigilance; Pharmacovigillance; Hospital.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Implementation of Health Education Strategies for Newly Transplanted Patients: Focus on Autonomy and Engagement in Pharmacotherapy Management

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About this scientific work

DOI: 10.62922/4cbffc.cp027
Link: https://doi.org/10.62922/4cbffc.cp027
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Non-adherence to drug treatment is a multidimensional factor that involves cultural and economic issues, directly affecting patients and thus hindering access to the resources needed to continue the treatment proposed by the health professional. as a result, complications related to adherence are generating considerable problems, such as recurrent adverse effects and treatment failure (1, 2). In this context, health education strategies present themselves as viable solutions committed to solidarity, anchored in promoting people and improving their quality of life (3). Patients are encouraged to take the lead and be primarily responsible for their own self-care. Providing them with the necessary information about their clinical condition and current pharmacotherapy and making them knowledgeable about their health and treatment. Thus, there are groups of patients who require greater involvement in their self-

care, such as transplant patients (4,5). After a transplant, the transplant patient's routine becomes a little more complex due to the inclusion of different groups of drugs, the main one being immunosuppressants (6). At this point, the risk of medication errors increases due to the incorrect or incomplete transfer of information. Having access to medication does not necessarily imply better health or quality of life, as its misuse can lead to potential undesirable events. Positive clinical outcomes in transplants are directly related to the patient's regular commitment to their treatment. Non-adherence to immunosuppressive drugs leads to an increased incidence of rejection and is understood as any deviation from the prescribed immunosuppressive therapeutic regimen capable of negatively influencing the expected results (7).

Aim

Objectives: to implement health education strategies for newly transplanted patients, with a focus on autonomy and engagement in pharmacotherapy during hospitalization.

Methods

This was a descriptive and prospective study carried out in a liver and kidney transplant ward over a period of five months in 2023 by clinical pharmacists from the service and resident pharmacists at a highly complex university hospital. The inclusion criteria were all newly transplanted kidney and liver recipient patients in the period who consented to take part in the study. Patients with cognitive impairments did not take part. The information collected was stored in an electronic spreadsheet for data analysis. A health education tool was used, which was made available in columns and gaps for patients to record all the medicines they used orally, including the name of the medicine, physical aspects (color and shape), dose, time taken, and indication. an instrument adapted for patients who could not read and/or write was developed and made available with visual techniques, using colors and drawings. Pharmacists monitored patients daily for five consecutive days through bedside visits, with the aim of educating, encouraging, and assessing their level of understanding of the oral medicines used during hospitalization. The patient's engagement in the education strategy and their ability to verbalize the medications in use, indications, and doses were considered as evaluation criteria. At the end, the patient was given a certificate of participation in order to recognize their commitment to participating in the education process. After the five-day period, weekly follow-up was carried out two to three times a week, where the pharmacist reinforced all the information he had covered until the patient was discharged.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

of the 39 patients transplanted in this period, 92.3% (n = 36) agreed to take part in the medication use management strategy and signed the informed consent form, and only 7.7% (n = 3) of the patients did not take part, these being liver transplant patients. Of the 36 patients who agreed to take part in the study,

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

66.7% (n = 24) received a certificate of participation, and 33.3% (n = 12) did not. Of the latter, nine were liver transplant patients, and three were kidney transplant patients. Of the 36 patients who agreed to take part, five were given adapted strategies and forms, three for patients who could not read and/or write, and two for patients with bilateral visual impairment. Of the three patients who were given the adapted form, none received a certificate after carrying out the strategies. The two patients with visual impairments received a certificate.

Discussion

The percentage of patients who agreed to take part in the strategy was 92.3%, showing the patients' interest and engagement in learning about their health condition and their treatment. This was positive, given that after transplantation, the crucial factor for successful treatment is the use of immunosuppressant drugs in an appropriate manner, and therefore non-adherence to drug therapy is one of the causes of late graft loss (8). Of the patients who did not take part in the strategy, 7.7%, corresponding to three liver transplant patients, two of them were not followed up because they were not in a good mental state and had confused speech, which may have been related to hepatic encephalopathy caused by pre-transplant complications and which made it difficult to apply and implement the strategy in these patients, as well as difficulty writing due to the post-operative recovery period. to award the certificates, we took into account parameters indicating the patient's active involvement in the education strategy, such as filling in the information contained in the tool on a daily basis, the degree of assertiveness in filling it in, and demonstrating understanding of their pharmacotherapy when asked about the names of the drugs, doses, indications, and information on correct administration. Patients who met the criteria analyzed were more likely to have good adherence to treatment since they were engaged in the learning method and showed good understanding. Among the patients who agreed to take part in the strategy, 66.7% received a certificate of participation. This percentage represents a favorable performance, in which more than half of the participants were engaged in managing the use of their medication. Studies show that educational interventions involving patients can be effective in improving adherence to medication in a wide range of patient groups (9). Of the 33.3% who did not receive the certificate, nine were liver transplant patients who were unable to actively participate in the implementation of the strategy due to some post-transplant complication (complications, infectious context) or the encephalopathy condition itself; in these cases, the implementation of the strategy was carried out by the companions and the involvement of this patient was not observed. In the case of kidney transplants, of the three patients, one was a re-transplant and didn't get involved, justifying that he already had a lot of knowledge about these drugs. The other two patients showed little involvement because they placed themselves in the position of being dependent on their companions, reporting that they would take care of their pharmacotherapy. By allowing patients to take a more active role in their own care, autonomous medication management promotes autonomy and ownership of treatment. This can lead to a sense of empowerment on the part of patients, as it gives them more control over their own well-being and health, as well as enabling them to make informed decisions and be more involved in the treatment process (10).

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Medication Adherence; Health Education; Transplantation.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Clinical Services offered By Specialist Pharmacists to Transplant Patients Treated at a High-Complexity Hospital in Ceará

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About this scientific work

DOI: 10.62922/4cbffc.cp028
Link: https://doi.org/10.62922/4cbffc.cp028
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Pharmaceutical care is the model of practice that guides the provision of different pharmaceutical services directly aimed at the patient, the family and the community, with a view to preventing and resolving pharmacotherapy problems, the rational and optimal use of medicines, the promotion, protection and recovery of health, as well as the prevention of diseases and other health problems (1).The transplant patient represents a challenge for the health system, depending on the work of a multidisciplinary team throughout their care. The clinical pharmacist is an important player in post-transplant follow-up, and one of their roles is to engage the patient in their pharmacotherapy (2)

Aim

To describe the clinical services offered by pharmacists to transplant patients in a highly complex hospital.

Methods

This is a retrospective, cross-sectional study of the records of the Clinical Pharmacy Service of a high-complexity university hospital in the kidney and liver transplant units. The unit studied has 22 inpatient beds, 8 of which are for liver transplantation, 10 for kidney transplantation and 2 shared isolation beds. The period analyzed was from January 2023 to December 2023. The study quantifies drug reconciliations on hospital admissions. The clinical reviews of patients' pharmacotherapy were calculated using the patients/day indicator, which reflects the total number of days each patient was hospitalized during the period. Pharmaceutical recommendations made during the period and pharmaceutical guidance at hospital discharge were also recorded. The data analyzed was counted from the Clinical Pharmacy Unit indicators using the Microsoft Excel 2016 program and the Health Intelligence Dashboard Presentation Tool (FAPIS).

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

During the period analyzed, 286 patients were admitted to the units, 186 of them (65%) from kidney transplantation and 100 (35%) from liver transplantation. Of the 286 patients admitted, drug reconciliation was carried out on 277 patients (94.8%). The number of patients/day during this period was 3885, of which 2432 (66.2%) were kidney transplant patients and 1453 (37.4%) were liver transplant patients. The number of clinical pharmacotherapy reviews was 3678, of which 2432 (66.12%) were kidney transplants and 1246 (33.88%) liver transplants. The percentage of patients reviewed was 94.7%. The total number of pharmaceutical recommendations made during the period was 999, of which 934 were accepted (95.3%) by the multi-professional team. Of the 999 recommendations, 530 (53%) were for kidney transplantation, of which 498 (94%) were accepted. In liver transplantation, 469 (47%) recommendations were made, of which 436 (93%) were accepted. During the period, 89 pharmaceutical guidelines were given at hospital discharge, 57 (64%) for kidney transplants and 32 (36%) for liver transplants. The number of drugs prescribed at hospital discharge in kidney transplantation was 623, with an average of 10.93 drugs prescribed per patient. In liver transplantation, the number was 248 drugs, with an average of 7.75 drugs per patient.

Discussion

The clinical pharmacist in the hospital pharmacy practice setting has the opportunity to provide a range of services that reflect pharmaceutical care in healthcare. In the cycle of care for an inpatient, the first step is drug reconciliation, which aims to identify discrepancies between the drugs prescribed at the

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

institution on admission and the drugs previously used by the patient. In the transplant ward, patients are referred from an outpatient consultation, referral from other levels of care or transferred from another unit within the hospital. These stages are processes that are sensitive to medication errors and drug-related adverse events due to the need to retrieve previous information, so medication reconciliation is very useful in ensuring that the necessary pharmacotherapy is maintained for the patient (3). During hospitalization, the clinical pharmacist carries out a daily clinical review of the pharmacotherapy, with the aim of detecting the presence of problems related to the prescription and finding ways to optimize the pharmacotherapy through an in-depth analysis of clinical and laboratory parameters, aiming for better therapeutic results [1]. At the end of the process, hospital discharge is often a time marked by changes in pharmacotherapy, and it is important that the patient has a good understanding of medication adherence. to this end, a series of strategies are applied at hospital discharge, such as the preparation of a detailed medication plan with timetables and dosages, adaptations for non-literate and visually impaired patients and the delivery of an information folder. The greater number of patients treated in the kidney transplant unit justifies the greater occurrence of medication reconciliations, clinical reviews and discharge instructions. All these moments of patient monitoring allow the pharmacist to detect improvements in pharmacotherapy and work processes, resulting in possible pharmaceutical recommendations. The number of recommendations between the wards is similar due to some work processes, such as the lower number of medical professionals and the high turnover of visiting professionals in liver transplantation, leading to a greater need for pharmaceutical recommendations despite the lower number of patients seen

Keywords

Clinical Pharmacist; Pharmaceutical Care; Transplantation.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmaceutical Care and Mental Health: a Literature Review on Integrated Approaches

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About this scientific work

DOI: 10.62922/4cbffc.cp030
Link: https://doi.org/10.62922/4cbffc.cp030
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Health is a state of balance between an individual's physical, social, and mental well-being. Although all aspects are equally important in maintaining homeostasis, mental health often does not receive adequate attention. Globally, approximately 700 million people face some form of psychological disorder, and studies suggest that this number could increase by about 20% by 2024 (1). In Brazil, the National Health Council (CNS) estimates that around 23 million people suffer from mental disorders, with 5 million experiencing chronic conditions. Treatment for these disorders often involves the use of psychotropic medications, which act directly on the central nervous system to promote behavioral changes. While various psychotropics exist for similar purposes, the choice of medication must consider multiple factors, such as age and underlying health conditions (2). Ensuring the rational use of these medications and universal access is crucial. In this context, pharmacists play a fundamental role in promoting health, contributing to the rational use of medications and conducting necessary pharmacovigilance. This paper aims to describe the importance of pharmaceutical care in the treatment of mental disorders, highlighting how the pharmacist's role can improve the efficacy and safety of treatment for these disorders (3).

Aim

The paper aims to analyze the importance of pharmaceutical care in treating mental disorders, focusing on the pharmacist's role in promoting rational use of psychotropics and ensuring medication safety. It explores how pharmacists can enhance treatment adherence, optimize mental health treatment, and identify strategies for universal, rational access to psychotropics to improve overall mental health.

Methods

This study employed a systematic literature review to examine the relevance of pharmaceutical care in the treatment of mental disorders. The analysis included national and international articles from the Virtual Health Library, "SciELO," and "PUBMED." Descriptors used encompassed “pharmaceutical care,” “mental health,” “rational use of psychotropics,” and “pharmacovigilance,” as well as their English translations. Article selection was conducted through a thorough review of titles, abstracts, methodologies, and results presented. Studies that did not specifically address the role of pharmacists in managing mental disorders or did not provide relevant data on the administration of psychotropics were excluded. Selected articles were categorized based on the type of research (e.g., clinical studies, literature reviews, opinion surveys) and the aspects analyzed, including pharmacovigilance practices, efficacy of psychotropics, and impact on treatment adherence. Data on the role of pharmacists, strategies for rational medication use, and observed results in improving mental disorders were extracted. This methodological approach allowed for a comprehensive analysis of advancements and challenges in pharmaceutical care, providing a deeper understanding of practices and contributing to the identification of new directions for research and development of more effective interventions in mental disorder treatment.

Results

The understanding and treatment of mental disorders have evolved significantly. In the Neolithic period, mental illnesses were often attributed to supernatural causes like demonic possession, and practices such as trepanation were used to expel evil spirits (4). By the late 19th century, Sigmund Freud's theory of the unconscious mind and techniques like dream analysis introduced new approaches to psychotherapy. In the 1990s, the advent of psychotropic drugs like chlorpromazine and fluoxetine revolutionized treatment, offering new therapeutic options for mental conditions (5). A key milestone was the creation of the Psychosocial Care Center (CAPS) in São Paulo in 1987, which introduced a community-oriented model of mental health care, gradually replacing the old psychiatric hospital system. This model was expanded with the emergence of Psychosocial Care Nucleus (NAPS) around 1989, providing alternative, less institutionalized care (6). These advancements reflect the shift from supernatural interpretations to integrated approaches combining pharmacotherapy, psychotherapy, and community services.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

The psychiatric reform of the 1970s marked a crucial point in the evolution of mental disorder treatment by dismantling the asylum model, which was widely criticized for its inhumane conditions and abusive practices. The new approach, established by the National Mental Health Policy, sought to replace asylums with more integrated and humane forms of treatment, such as the Psychosocial Care Centers (CAPS) and Therapeutic Residences (RTs). These new models aim for the reintegration of patients into society and offer an alternative to the previous system, which failed to provide adequate and dignified care (4). The creation and expansion of CAPS and NAPS have been notable since their implementation. Ordinance No. 224/92, which regulated the accreditation and funding of these services by the Unified Health System (SUS), facilitated the dissemination and growth of these centers throughout Brazil. With the increase in the number of CAPS, which rose from 160 in 1995 to over 500 in 2004, there has been an improvement in accessibility and quality of care for patients with mental disorders. These centers represent a significant advance in promoting more inclusive and efficient mental health care (7). However, the rise in psychotropic drug use has placed new demands on the health system. The widespread prescription of psychotropic medications, necessary due to the increase in mental disorder diagnoses, highlights the importance of rigorous control and specialized guidance. The pharmacist plays a central role in this scenario, being responsible for the appropriate management of these medications, which have potential risks of dependence and adverse effects. RDC No. 50, of September 25, 2014, establishes norms for the prescription and safe dispensing of controlled substances, reflecting the need for a careful approach in administering these drugs (8). Pharmaceutical care, therefore, extends beyond the mere distribution of medications. It involves the management of medication therapy, including monitoring treatment adherence and minimizing risks associated with polypharmacy. Polypharmacy, common in the treatment of mental disorders, requires meticulous monitoring to avoid harmful drug interactions and ensure treatment efficacy. The pharmacist must ensure that patients understand the importance of strictly following the therapeutic regimen and not discontinuing medication without professional guidance (9). Furthermore, the pharmacist's work is essential for educating patients and their families about medication use and necessary care during treatment. In collaboration with the healthcare team, the pharmacist helps coordinate care, ensuring that therapeutic goals are met and that any adverse reactions or complications are promptly addressed. This educational and collaborative role is crucial for the success of treatment and the overall improvement of patients' mental health (10). Thus, the evolution of mental health care models and the growing importance of the pharmacist's role reflect a significant advancement in the field. These changes have not only improved the quality of care but also strengthened the support provided to patients, promoting a more integrated and effective approach in managing mental disorders.

Keywords

Psychiatric Reform; Pharmaceutical Care; Caps.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Impact of Pharmaceutical Care on Smoking Cessation

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About this scientific work

DOI: 10.62922/4cbffc.cp031
Link: https://doi.org/10.62922/4cbffc.cp031
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Smoking is recognized as a chronic disease caused by nicotine`s dependence present in tobacco-based products and it is included in the group of mental and behavioral disorders of the Revision of the International Statistical Classification of Diseases and Related Health Problems [ICD-11] due to the use of psychoactive substances (1). It is estimated that current smokers consume about six trillion cigarettes every year, and this use is responsible for the annual deaths of 8 million people, including about 1.3 million non-smokers who are exposed to secondhand smoke (1). Nicotiana tabacum, popularly known as tobacco, is a plant whose leaves are used in the production of different products that have nicotine as the active ingredient, which causes addiction (2). Smoking is a crucial factor in the cause and worsening

of many respiratory diseases. The main respiratory diseases associated with smoking include bronchial asthma, chronic obstructive pulmonary disease (COPD), emphysema, interstitial lung diseases, pulmonary fibrosis, lung cancer, etc. However, the harm caused by tobacco is not limited to respiratory problems, but also includes cardiovascular and hormonal problems (3). In health promotion, smoking cessation services aim to promote, prevent, cure and rehabilitate, comprehensively addressing the biopsychosocial aspect of the health-disease process. Pharmacological measures, often necessary in smoking cessation, help reduce withdrawal symptoms and the desire to smoke (4). Approximately 70% of smokers want to quit, but generally they make about 6 attempts before achieving long-term abstinence. Health professionals play a crucial role in motivating and increasing the chances of success in these attempts to quit smoking (5). In this sense, the pharmacist, when offering a clinical service, must assist the smoker, taking advantage of his/her accessibility to establish a close therapeutic relationship (6).

Aim

This review aims to assess the importance of pharmaceutical care in smoking cessation services.

Methods

This is a literature review study with a qualitative approach. The method was chosen for its ability to address topics in a broad and subjective way. These studies help to update knowledge quickly, being comprehensive publications that discuss theoretical or contextual points of view (7). In order to operationalize the review, a guiding research question was initially formulated, structured according to the PICO strategy - Problem, Intervention, Comparison and Outcome. This review aims to answer: “What is the impact of pharmaceutical care for patients in the smoking cessation process?”. The research for articles was carried out in the following databases: National Library of Medicine (PubMed), Scientific Electronic Library Online (SciELO) and Scopus. Then, to locate the articles, the cross-referencing of the Health Sciences Descriptors (DeCS/MeSH) and the Boolean operators “AND” and “OR” were applied in the cited databases: [Smoking cessation" OR "Smoking Cessation Agents AND Pharmaceutical Services]; [“Smoking cessation" OR"Smoking Cessation Agents"]; [“Nicotine” AND “Dependency”]. Only full articles published in the last 5 years, in English, and that answered the question of interest of the study were included.

Results

Pharmacists are considered valuable sources of expert knowledge for both healthcare professionals and patients (8). The pharmacist is a crucial part of the effective communities pharmacy smoking cessation services, once smoking is a major cause of many non-communicable diseases (NCDs) and smoking cessation is a global NCD goal. The smoking cessation process must be handled with the utmost professionalism by healthcare professionals. One of the tools used in the process is medication, and the pharmacist is the key person in ensuring that the patient will use the medication correctly and safely (9). The health care professionals specialize in patient counseling and medication dispensing. Pharmacists can provide behavioral interventions using the 5A’s method to help smokers achieve their goals. This

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

method – Ask, Advise, Assess, Assist, and Arrange – is widely used to assist in smoking cessation. In addition, it can be used as a proactive tool to identify smokers who are unaware of smoking cessation services and provide the necessary help (9). The Fagerström test measures the level of nicotine dependence. All patients should have their level of nicotine dependence assessed, as this dependence makes the withdrawal process more difficult, causing uncomfortable symptoms in people trying to quit smoking and increasing the chances of relapse (10). The first line of therapy for smoking cessation consists of: nicotine replacement therapy (NRT), varenicline and bupropion. In this sense, the pharmacist can prescribe NRT and the others can dispense and monitor it (11).

Discussion

Studies have found that smoking cessation services at community pharmacies resulted in 28.8% of smokers quitting smoking for at least 30 days, although not all smokers were successful in quitting, smokers reduced the number of cigarettes smoked daily and increased lung function, leading to better health (9). Despite the different natures and designs of the published intervention studies (motivational support alone or combined with nicotinic and non-nicotinic medications), a study conducted in Portugal revealed a success rate of 135 smokers who set a day to quit smoking, 59 (43.7%) quit smoking one month later. The quit rate decreased to 32.6% after three months, 28.1% after six months and 20.7% after 12 months. Success was significantly more frequent among patients who underwent pharmacological therapies, as well as among those who participated in more consultations and telephone sessions (12). Comorbidities may lead to greater awareness; the aforementioned study found that abstinence rates were higher among patients with dyslipidemia, possibly due to greater awareness of cardiovascular risk. However, the success rate was lower in patients with depression, consistent with data in the literature. Other studies have shown mixed results on the association between chronic diseases and success in smoking cessation (12).

Keywords

Smoking Cessation; Smoking; Pharmaceutical Care.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Influence of Light and Environmental Temperature on the Hydrogen Potential of Intravenous Antimicrobials: an Integrative Review

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About this scientific work

DOI: 10.62922/4cbffc.cp032
Link: https://doi.org/10.62922/4cbffc.cp032
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Antimicrobials are among the most prescribed medications in hospital units, holding a prominent position in both adult and pediatric therapeutic arsenals. Despite being important tools for treating infections, their prescription must be done judiciously, weighing the risks and benefits involved(1,2). The absence of specific formulations for the pediatric population imposes challenges in the intravenous administration of these medications, which can affect their stability. The stability of a medication refers

to its ability to maintain its physical, chemical, microbiological, therapeutic, and toxicological characteristics within the established specifications from the moment of manufacture until the moment of use(2,3,4). Ensuring pharmacological stability and physico-chemical compatibility is essential for the efficacy and safety of drug therapy(5). Maintaining the stability of medications under environmental conditions in hospital units is a critical element for the safe administration of drug therapy(6), as the result of degradation can be the formation of an inactive therapeutic principle or, in some cases, the generation of a toxic substance as a result of the reaction(7). Several controllable environmental factors that affect the stability of medications, such as light, humidity, and temperature, influence the degradation of drugs(8). These factors can lead to changes in the intrinsic characteristics of the medication, such as the hydrogen potential (pH) value. Changes in pH are particularly significant(9). Brazilian hospitals face unique challenges in terms of environmental control. Temperature and light variations are common due to diverse climatic conditions and variable infrastructure(2).

Aim

Objective: to identify in the scientific literature the influence of light and ambient temperature on the hydrogen potential (pH) of intravenous antimicrobials used in the hospital context.

Methods

Method: an integrative literature review was conducted between May and July 2024. Articles indexed in the Scientific Electronic Library Online, Latin American and Caribbean Health Sciences Literature, Virtual Health Library and Medical Literature Analysis and Retrieval System Online databases were analyzed, using Mesh and Decs descriptors in English and Portuguese, with terms: “hydrogen-ion concentration,” “temperature,” “light,” and “antimicrobials” alternating in the different databases using the “AND” operator. Original articles in Portuguese, English, and Spanish, with no publication year restriction, were considered. Data analysis included a critical review of the methods used, results obtained, and clinical implications of the findings. A summary table with the main information extracted from the articles used was prepared.

Results

There is little evidence on the pH of antimicrobial solutions subjected to environmental conditions. Research has revealed that the degradation of medications in the hospital environment can be catalyzed by extremes of pH, temperature, drug concentration, and light exposure (7), which can interfere with stability. Some medications remain stable within a pH range of 4 to 8. Drug formulations with a pH below 4, despite increasing shelf life, present a higher risk of causing complications during intravenous therapy(7). The influence of temperature is directly related to the ability to significantly intensify the speed of chemical reactions by providing kinetic energy that exceeds the activation energy required for reactions to occur(10). Thus, an increase in ambient temperature influences the degradation of solutions, altering the pH and consequently leading to drug instability(5). Regarding light, it was observed that an increase in light intensity is directly proportional to the increase in the rate and/or degree of degradation(5).

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

Maintaining pharmacological stability is essential to providing correct and adequate drug therapy to the patient. Given that pH can contribute to various complications, it is important to know the value of this chemical characteristic of intravenous medications prescribed in the hospital environment to ensure safer and more effective care(11). In addition to causing changes at the intravenous administration site, pH extremes can accelerate the degradation of many drugs, also influenced by other factors such as temperature, light, and solution concentration. It is important to highlight that drug instability can result in changes in pH(5). In general, increasing environmental condition parameters affects the degradation rate of solutions, resulting in changes in pH and consequent pharmacological instability(11). The main drug degradation reactions are influenced by acids and/or bases, highlighting the importance of studying pH as a factor that can accelerate or delay these reactions. Monitoring pH throughout the infusion time, for example, provides crucial information about the stability of solutions, with changes in pH indicative of the degradation of the main compound(2). Therefore, it is crucial to verify the pH of each component of a solution beforehand to prevent therapeutic damage and other complications.

Keywords

Light; Temperature; Antimicrobials; Stability; PH.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Importance of Pharmaceutical Care in the Dispensation of Levonorgestrel

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About this scientific work

DOI: 10.62922/4cbffc.cp033
Link: https://doi.org/10.62922/4cbffc.cp033
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The morning-after pill is a medication developed by scientist Albert Yuzpe with the aim of preventing pregnancy resulting from sexual violence. In 1996, the Ministry of Health approved and included this method in the family planning manual. Its mechanism of action depends on the phase of the menstrual cycle in which the medication is administered, preventing the fertilization of the sperm by the egg. Levonorgestrel is easily accessible, as it can be obtained for free through the Unified Health System (SUS) and can also be purchased in pharmacies, since this medication does not require a prescription for dispensation. This ease of access has led to the abusive and irrational use of the morning-after pill. Therefore, this article aims to emphasize the importance of applying pharmaceutical care at the moment of dispensing the morning-after pill, with the intent of reducing health risks to the patient that may result from self-medication.

Aim

To raise awareness among current and future pharmacists about the importance of guiding patients on the use of the morning-after pill at the time of dispensation.

Methods

The research was based on a bibliographic review conducted between June and August 2022. Only articles published between 2015 and 2022 were selected, according to the chosen topic. to select the articles, the Google search engine was used to find keywords related to the topic, such as: emergency contraceptive, morning-after pill, and levonorgestrel. The databases used to structure the work were Google Scholar, SciELO (Scientific Electronic Library Online), BDJ, and Reicen. Additionally, a Ministry of Health booklet, a contraceptive manual from Febrasgo, and three medication leaflets were also used. The inclusion criteria were articles published in Portuguese from 2015 to 2022, available for free. They covered topics related to self-medication with levonorgestrel, pharmaceutical care regarding the morning-after pill, and the misuse of levonorgestrel. In total, nine scientific articles, three medication leaflets, and one federal government booklet were selected for the construction of the work. The exclusion criteria were articles published in foreign languages, works published before 2015, and research that did not address topics related to the theme of this article. In total, 5 scientific articles were excluded, resulting in approximately 14 articles reviewed for inclusion and exclusion.

Results

The primary users of the morning-after pill are young individuals with an active sex life. A significant portion of this group chooses to use the medication without guidance from a qualified health professional, including pharmacists (6). One of the justifications for self-medication with levonorgestrel is the easy accessibility of this medication, which can be sold without a prescription from a qualified professional. Additionally, there is a lack of guidance from both counter staff and pharmacists at the time of dispensing the morning-after pill. Due to these factors, patients are exposed to potential consequences resulting from the irrational use of the emergency contraceptive (5). The lack of information about the correct use of the morning-after pill and its effects has led many young people to adopt this medication as a routine contraceptive method, rather than using it only in emergency situations for which it is intended (4). Levonorgestrel is a very effective medication; however, due to its high hormonal content, continuous use of this medication can cause adverse effects in the female body, such as cervical cancer, breast cancer, reduced therapeutic efficacy which can lead to unwanted pregnancy, and infertility (3). The importance of pharmaceutical guidance at the time of dispensing the morning-after pill can prevent harm to the female body. Therefore, it is crucial to provide information on correct usage, potential effects, contraindications, possible drug interactions, and to address any patient questions at this moment (1). According to Article 2 and Article 3 of Law No. 13,021 of August 8, 2014 (2), which addresses the practice and oversight of pharmaceutical activities, the role of the pharmacist extends beyond merely dispensing medication. The pharmacist must provide therapeutic assistance with the goal of promoting, protecting, and recovering the patient's health, using medication as a crucial means to achieve these goals. A pharmacy is not jus

Discussion

The pharmacist should adopt the behavior of a healthcare professional in the pharmacy when dispensing levonorgestrel, rather than just that of a salesperson looking to sell the product. The pharmacist must

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

take a more cautious approach by asking questions to the patient and providing guidance on the use of the medication, as any mistake could lead to harm or even death. This healthcare professional must always be aware that they are dealing with lives, not just a product, thus ensuring that the patient feels safer and is more likely to return due to the quality of pharmaceutical care.

Keywords

Levonorgestrel; Pharmaceutical Care; Self-Medication.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The New Role of Pharmacists in Brazil: the Prescription of Hormonal Contraceptives

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About this scientific work

DOI: 10.62922/4cbffc.cp034
Link: https://doi.org/10.62922/4cbffc.cp034
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Unwanted pregnancy is considered a public health issue in several countries and has recently garnered increasing research attention over the past decades. Evidence suggests that one in four unwanted pregnancies ends in unsafe abortions, which is one of the leading causes of maternal mortality globally. Generally, this type of pregnancy refers to a gestation that occurs at an unplanned or inopportune time, potentially leading to a series of adverse consequences for the physical and psychological health of the parents, and subsequently affecting socioeconomic factors within the family environment (1). Considering factors such as: sexual and reproductive rights being an integral part of human rights and encompassing self-directed contraception (2), the fact that, in the context of pregnancy prevention, hormonal contraceptive (HC) prescriptions do not require a medical diagnosis (3), and that pharmacists are qualified professionals who, from their undergraduate education, are trained in components that attribute to their clinical capabilities, it is justifiable for pharmacists to prescribe HCs.

Aim

This paper aims to present and justify the prescription of HCs by pharmacists by demonstrating the aspects faced in public health due to easy access to HCs and consequently self-medication, as well as the qualifications of the professional in question.

Methods

This is an integrative literature review, using databases such as Scielo (Scientific Electronic Library Online), high-impact journals found through Google Scholar, resolutions published by the Federal Pharmacy Council (CFF), and its "Protocol for Prescribing Hormonal Contraceptives by Pharmacists". Articles were selected without chronological restrictions and included those in English and Portuguese with descriptors: Sexual and Reproductive Rights, Pregnancy and Abortion, extracted from Health Science Descriptors (DeCS).

Results

The review demonstrates that pharmacist-prescribed HCs can increase access to contraceptive methods and consequently reduce unwanted pregnancy rates. It is also expected that pharmacist-prescribed HCs, as a means of expanding safe access to contraceptives, may help reduce the incidence of maternal mortality from unsafe abortions, as safe access to contraceptive methods can significantly improve reproductive health. The approved protocol, developed by the CFF's Continuing Education Working Group, showed alignment with the population's needs through a checklist for anamnesis with questions and procedures, risk assessment, criteria for referrals, major drug interactions involving HCs, advantages and disadvantages of HC use, flowcharts for management and choice, and outcome evaluations, with all steps based on strong evidence.

Discussion

The primary factors potentially related to the high rates of unwanted pregnancies worldwide are the lack of sexual education and difficulty accessing contraceptive methods (4). Including pharmacists in the prescription of HCs represents a beneficial advancement for public health, incorporating continued education for pharmacists in public and private services and ensuring safe access to HCs for the population. The protocol aims for a positive impact on reducing self-medication, which is a prevalent practice in Brazil and worldwide (5), with pharmacists playing a crucial role in Medication-Related Problems, including HC use. It is essential that the counseling provided by the prescribing professional be inclusive, unbiased, and evidence-based, ensuring respectful practice regarding reproductive rights and avoiding ethical complications. All HC prescription consultations should include follow-up of outcomes as established by the CFF protocol, as this is considered a crucial component for ensuring safety and long-term adherence (3). This decision also opens the door to further research on the efficacy of pharmacist prescriptions, allowing evaluation of patient satisfaction and clinical approach effectiveness to ensure the practice continues to meet the population's needs in an accessible, efficient, and ethical manner.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Hormonal Contraceptives; Pharmacists; Pregnancy.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Clinical Interventions By Pharmacists in Smoking Cessation

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About this scientific work

DOI: 10.62922/4cbffc.cp035
Link: https://doi.org/10.62922/4cbffc.cp035
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Due to societal evolution and technological advances, there has been a change in lifestyle patterns. This has resulted in change in population longevity, significant growth in obesity, and chronic diseases such as diabetes, Chronic Obstructive Pulmonary Disease (COPD), cardiovascular disease, and lung cancer. Many of these illnesses are caused by unhealthy habits such as smoking, sedentary lifestyles, unbalanced diets and excessive alcohol consumption (1). Smoking is widely recognized as a risk factor not only for the smoker but also for those exposed to second-hand smoke (2). According to the World Health Organization (WHO), smoking is the leading preventable cause of chronic diseases, reduced quality of life, and death worldwide. There are various ways to consume tobacco, including cigarettes, pipes, cigars, hookahs, and others. The industry continually evolves with innovative products like electronic cigarettes, designed to attract and increase consumer dependence. Unlike conventional cigarettes, electronic cigarettes use heat rather than combustion to release nicotine. Alongside traditional and electronic cigarettes, heated tobacco products have emerged, making pharmacist

guidance crucial in definitively combating smoking. Thus, one of the most common medicinal therapies is Nicotine Replacement Therapy (NRT), which includes the use of nicotine-containing medications to alleviate physical and psychological symptoms from tobacco cessation. Available options include gum, lozenges, and transdermal patches.

Aim

This study aims to contextualize the impact of smoking and the clinical pharmacist's role in highlighting prevention and control strategies in smoking cessation processes.

Methods

This is a bibliographic literature review. Articles published between 2018 and 2024, in Portuguese or English, were selected from databases including Lilacs (Latin America and the Caribbean Health Sciences), Scielo (Scientific Electronic Library Online), Science Direct, and MedLine (Medical Literature Analysis and Retrieval System Online).

Results

Pharmacotherapy is recommended for nicotine-dependent individuals, including medications such as bupropion and nicotine replacement therapy. Bupropion is a non-tricyclic antidepressant that inhibits the presynaptic reuptake of dopamine and norepinephrine (1). Its effect on central dopamine pathways is believed to reduce smoking cravings in patients quitting smoking. Treatment starts with a 150mg dose in the morning for three to four days, and if well-tolerated, the dose is increased to 150mg twice daily, with at least an eight-hour interval between doses (3). Due to potential insomnia as a side effect, the second dose is recommended in the late afternoon or early evening. Unlike nicotine replacement therapy, smokers should start taking bupropion a week before quitting smoking to ensure steady blood levels (4). Nicotine replacement helps the body receive decreasing amounts of the substance over time, reducing physical withdrawal symptoms without exposing patients to harmful tobacco elements. The most popular forms of NRT include patches and gums (5). Patches release nicotine steadily through the skin, with daily doses reduced over the course of treatment. to apply the patch, choose a clean, hairless area of skin in the morning, keeping it on for 24 hours (3). Gums act quickly by releasing nicotine into the oral mucosa, chewed until a peppery taste is felt, then placed between the gum and cheek for two minutes before chewing again. This procedure can be repeated every hour, combined with the patch, to manage craving moments.

Discussion

Pharmacists play a crucial role in healthcare and innovation. By continuously monitoring users, a comprehensive analysis of tobacco consumption patterns can be performed, essential for developing personalized therapeutic strategies for smoking control (4). The recommended approach to address dependence involves combining pharmacotherapy with counseling provided by a healthcare professional. Thus, Pharmaceutical Care has the potential to offer support and become an integral part of actions and services within the healthcare system, enhancing treatment efficacy and safety (5). The

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

pharmacist's contribution ranges from technical medication management to supporting smokers, aiming to increase patient motivation to quit smoking (3).

Keywords

Tobacco; Pharmacist; Smoking Cessation.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmaceutical Consultation: Building a Model of Adherence to Immunosuppressive Therapy for Post-Transplant Patients

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About this scientific work

DOI: 10.62922/4cbffc.cp036
Link: https://doi.org/10.62922/4cbffc.cp036
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The transplant patient represents a challenge for the health system, depending on the work of a multidisciplinary team throughout their care. The clinical pharmacist is an important player in post-transplant follow-up, and one of their roles is to promote patient engagement in their pharmacotherapy. The adherence process requires outpatient follow-up through structured pharmaceutical consultations with the aim of educating the patient and improving clinical outcomes (1). to this end, tools are needed to measure adherence and promote the rational use of immunosuppressive therapy.(2)

Aim

To describe the process of implementing the monitoring of adherence to the treatment of immunosuppressive therapy by the clinical pharmacist through the pharmaceutical consultation with the transplant patient.

Methods

This is a descriptive summary of the implementation phases of immunosuppressive therapy adherence tools. 1. Identifying needs: meetings were held with the service's clinical pharmacists and residents to identify points of weakness in monitoring adherence. 2. reviewing the literature: a search was made in databases for the main tools used in clinical practice that could better identify patients who were not adherent to immunosuppressive therapy. Selection of tools: Those involved selected the most viable tools for the context of the institution, and their criteria for use were defined. 4. Implementation: the clinical pharmacists, together with the residents, implemented the selected tools in outpatient pharmaceutical consultations with a focus on newly transplanted patients as well as non-adherent late transplant patients referred by the multidisciplinary team. Patients were scheduled by the pharmacist independently of the appointments of other members of the multidisciplinary team. 5 Evaluation: Adherence was monitored in conjunction with laboratory tests and rejection rates, establishing a relationship whereby higher adherence rates corresponded to lower rejection rates.

Results

The tools selected were: monitoring of immunosuppressant serum levels, immunosuppressant dispensing history, patient self-report, and the use of the BASSIS® questionnaire version 17.09.2012. It was standardized that the serum levels of the immunosuppressants considered as references were defined according to the institutional protocol of the kidney and liver transplant services. The history of drug withdrawal was monitored at each pharmaceutical consultation, as was the collection of patients' self-reports. It was decided to apply the adherence questionnaire at the first return visit to the pharmacist, where there may be changes in pharmacotherapy after the first medical consultation. The questionnaire will be administered at pharmacy appointments every three months after the transplant. In late transplant patients referred by the team, the questionnaire is administered at the interconsultation and on their return visit, assessing the need for follow-up for patients with adherence problems.

Discussion

The literature reports that no one tool is sufficient and that it is necessary to use them in conjunction with other strategies in order to better understand patient adherence. In this sense, there are a wide variety of methods used to assess adherence to the same health problem. Therefore, there is a need for a better definition of the methods used to classify patients as adherent or non-adherent (3).

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Pharmaceutical Consultations; Medication Adherence; Immunosuppression.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Combined Therapy of Cftr Modulators and Antibiotics in the Control of Pulmonary Exacerbations in Cystic Fibrosis — a Literature Review

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About this scientific work

DOI: 10.62922/4cbffc.cp037
Link: https://doi.org/10.62922/4cbffc.cp037
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Cystic fibrosis (CF) is a serious genetic disease that affects about 70,000 people worldwide. Caused by mutations in the Cystic Fibrosis Transmembrane Regulator (CFTR) gene, CF leads to the accumulation of large amounts of mucus in the lungs, directing to chronic infections. Pulmonary exacerbations, characterized by worsening of respiratory symptoms, are the main cause of morbidity and mortality in CF (1). Traditional treatment of this comorbidity is based on antibiotic therapy to fight infections and

improve lung function. However, long-term use of antibiotics can generate bacterial resistance, in addition to not treating the central cause of the disease: dysfunction of the CFTR gene. In recent years, CFTR modulators have emerged as a promising new strategy. Thus, by correcting or improving the function of the CFTR protein, these drugs can lead to several benefits, such as improved lung function, reduced lung infections, and a decreased frequency of pulmonary exacerbations.

Aim

To review scientific evidence on the advances of combined therapy of CFTR modulators and antibiotics in the control of pulmonary exacerbations in cystic fibrosis, with a focus on efficacy, safety, and impact on lung function and quality of life.

Methods

This consists of a literature review in which searches were carried out in the databases of the PubMed platform from 2019 to 2024. The Health Sciences Descriptors "Cystic Fibrosis", "CFTR modulators", "Antibiotics", "Combined Therapy" and "Pulmonary Exacerbations" were used, using the corresponding Boolean operator. The inclusion criteria were articles and clinical studies, in English and Portuguese, freely accessible, with full text, and related to the topic.

Results

This study identified 17 studies that addressed the combined therapy of CFTR modulators and antibiotics in the control of pulmonary exacerbations in CF. Of these, 10 were excluded due to the unavailability of free access, and another 2 did not effectively fit the proposed theme, leaving 5 studies for in-depth analysis. The data collected from these scientific studies prove the promising efficacy of combination therapy in reducing the frequency and severity of pulmonary exacerbations, the leading cause of mortality in CF. Most of the selected studies have shown that this reduction translates into fewer hospitalizations and, consequently, a better quality of life (1,5). In addition, the results demonstrated a reduction of 53% in the rate of pulmonary exacerbations in combination therapy groups. These results are particularly encouraging, as they suggest a robust ability to improve the quality of lung function in patients, manifesting itself in several parameters, including increased FEV1 (forced Expiratory Volume in One Second), a crucial indicator of lung health (2). In addition, the results confirmed that, in addition to the physiological benefits, the combined therapy of CFTR modulators and antibiotics also provides a positive impact on the quality of life of CF patients. From this perspective, there is a favorable safety profile in clinical trials (1,3,4,5). The most common adverse effects identified were gastrointestinal, such as nausea, diarrhea, and mild to moderate abdominal pain (2). Although combination therapy has not been shown to significantly increase the risk of bacterial resistance in short-term studies, long-term research is needed to characterize this aspect more accurately. These findings indicate that the combined therapy of CFTR modulators and antibiotics is a promising therapeutic strategy for the management of cystic fibrosis, offering substantial benefits to patients.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

The results obtained from the analyzed studies provide solid evidence of the efficacy of the combined therapy of CFTR modulators and antibiotics, representing a significant advance in the treatment of cystic fibrosis with the potential to significantly improve the prognosis of patients, decreasing disease-related morbidity and mortality (1,3,5). However, there are still challenges to overcome, such as long-term efficacy, so further studies are needed to evaluate the effectiveness of combination therapy in controlling pulmonary exacerbations over a prolonged period (5). It is essential to identify the patients who will benefit most from this therapeutic approach, optimize the use of available resources, and personalize treatment. Thus, the investigation of the synergistic mechanisms between CFTR modulators and antibiotics can lead to the development of even more effective therapies, exploring new combinations of modulators and antibiotics in order to enable a greater number of possibilities for individualized treatment (1,2,5). In summary, despite the challenges, the combination therapy of CFTR modulators and antibiotics represents hope for CF patients. With the advancement of research and the optimization of treatment protocols, this approach has the potential to transform the lives of people with this disease, providing them with a brighter future.

Keywords

Cystic Fibrosis; CFTR Modulators; Antibiotics.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Role of a Combination of Bupropion and Topiramate for Weight Management in Eating Disorders

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About this scientific work

DOI: 10.62922/4cbffc.cp038
Link: https://doi.org/10.62922/4cbffc.cp038
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Eating disorders (ED) are serious mental illnesses that affect millions of people around the world and are characterized by impulsive eating patterns, distorted thoughts, and behaviors related to weight and body image. The most common illnesses in this context are anorexia nervosa, bulimia, and binge-eating. However, achieving and maintaining a healthy weight for these patients can be extremely difficult due to the common mental symptoms of this clinical condition. In this context, the combination of bupropion and topiramate has been shown to be a promising alternative for weight control in patients with ED.

Bupropion, a noradrenergic and dopaminergic antidepressant, reduces appetite and improves mood, while topiramate, an anticonvulsant, has anti-obesity properties that reduce appetite and increase satiety.

Aim

This review aimed to collect information from the literature about the effectiveness of the combination of Bupropion and Topiramate in controlling body weight in patients with eating disorders.

Methods

This is a literature review. The analysis searched for articles employing Scielo and Virtual Health Library (VHL) databases, applying the following search terms: "bupropion", "topiramate", "eating disorders" and "weight management", using the corresponding Boolean operator. The inclusion criteria were articles and clinical studies in Portuguese and English between 2019 and 2024 that were freely accessible, with full text, and related to the topic.

Results

After reviewing 8 publications, five studies were selected because they met the review inclusion criteria. Some studies showed the effectiveness of the combination of bupropion and topiramate for weight management in eating disorders, including weight reduction (3,4,5). However, other studies did not identify any differences. Furthermore, in reducing binge-eating, it was noted that the combination may be effective in reducing the frequency and severity of binge-eating episodes in some individuals (2,5). In relation to improving mood, bupropion can help with this issue and also reduce depressive symptoms, which can contribute to the management of eating disorders (1). Regarding the safety of combining these two drugs, the studies were not conclusive, but they postulated that there may be side reactions such as nausea, vomiting, and diarrhea (2,4,5). Additionally, dry mouth, dizziness, sedation, insomnia, agitation, and mood changes, especially in adolescents and young adults, have also been reported as possible effects.

Discussion

The literature shows that the bupropion-topiramate combination promotes modest but significant weight loss compared to placebo (1). This means that it is important to highlight that weight loss can take different forms depending on several individual factors, such as metabolism, eating habits, and physical activity levels. However, the combination may be effective in reducing the frequency and severity of binge-eating disorders, thereby alleviating the stress and guilt associated with this type of behavior (2). In this way, patients may experience a reduction in the number of binge-eating episodes, the amount of food eaten during these episodes, and the intensity of negative emotions associated with them. Therefore, bupropion and topiramate can contribute to the control of depressive symptoms that often coexist with ED, helping to improve general mood and quality of life (3). This occurs through the bupropion mechanism, which inhibits the reuptake of dopamine and norepinephrine in the brain, modulating the reward system and reducing the compulsive desire for food. Dopamine and

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

norepinephrine are neurotransmitters that play an important role in regulating mood, motivation, and eating habits. By increasing the availability of these neurotransmitters in the brain, bupropion may help control intense food cravings, a common symptom of these disorders (4). Topiramate, in addition to its anticonvulsant properties, affects the central nervous system, reducing impulsivity and regulating appetite, which can help reduce excessive eating. Topiramate also plays a role in regulating the activity of several neurotransmitters and brain regions involved in impulse and appetite control. This activity can help reduce the impulsivity that leads to overeating and promote a longer feeling of satiety (5). In summary, the bupropion-topiramate combination is a promising option for weight control in patients facing these situations, especially those with binge-eating. However, it is important to use it with cautiousness and under strict medical supervision, with multidisciplinary treatment that meets the individual needs of each patient.

Keywords

Bupropion; Topiramate; Eating Disorders; Weight.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Role of the Clinical Pharmacist in Care for Individuals with Autism Spectrum Disorder (ASD)

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About this scientific work

DOI: 10.62922/4cbffc.cp039
Link: https://doi.org/10.62922/4cbffc.cp039
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Autism Spectrum Disorder (ASD), or autism, is a neurodevelopmental disorder characterized by atypical development, behavioral manifestations, deficits in communication and social interaction, repetitive and stereotyped behavior patterns, and may present a restricted repertoire of interests and activities. It usually manifests in early childhood (1). In this perspective, the diagnosis of the disorder should be made as early as possible due to the early manifestation of its signs (2). However, drug therapy is selected depending on the individual condition of the patient, since there is no objective or biological test criteria to evaluate the efficacy of the drug in these patients (3). Thus, the clinical pharmacist plays a crucial role in the treatment of ASD, since he or she is the professional qualified to provide guidance to patients and caregivers on possible drug interactions, adverse effects, adequate dosage and posology, aiming to obtain results that promote the improvement of quality of life and the responsible use of pharmacotherapy (2).

Aim

To analyze the existing literature and identify the importance of the clinical pharmacist in the care of individuals with autism spectrum disorder.

Methods

This is a descriptive, qualitative study presented in the form of a literature review. The search for scientific articles was carried out through the CAPES Periodicals and Google Scholar databases, using the following terms: “Pharmaceutical care” and “Autism Spectrum Disorder”. to this end, the search strategy was determined by combining the selected descriptors in their terms in both English and Portuguese with the aid of the Boolean operator AND. In order to reduce the number of articles to be analyzed, articles published in Portuguese and English, which were available in full and were published between 2021-2024, were selected. From the titles and abstracts found, those that were not published in the chosen range or did not directly address the proposed theme were excluded.

Results

After the bibliographic survey, 5 studies that directly address pharmaceutical care for individuals with ASD were selected. Pharmacists are professionals who work in public health policy, promoting medication adherence and pharmaceutical guidance (4). Therefore, they are qualified to promote the rational use of medications, comprehensive care, and an emphasis on preventing complications in patients with ASD (1). In some cases, these patients receive multiple medications that are sometimes added as new symptoms or problems arise, and a second medication may even be added to control the side effects of the first. Therefore, pharmaceutical care for patients with autistic disorder does not only involve pharmacological treatment, but also guidance on correct use and monitoring of dosage and route of administration (3). However, the available drug treatments treat the core symptoms of the autistic spectrum and not the disorder itself. In Brazil, the only medications approved by the Brazilian Health Regulatory Agency (ANVISA) are Risperidone and Periciazine, used to control the symptoms associated with ASD (5).

Discussion

Costa and Andrade (4) emphasize that the pharmacist's contribution is to manage and outline the pharmacotherapy profile with differentiated attention, especially for children with ASD, in addition to providing information to the patient's family, who will be responsible for administering the medications, in order to avoid errors in administration and possible drug interactions. Similarly, Oliveira et al. (1) describe in their study that Pharmaceutical Services and Policies can represent a differential in the management of pharmacotherapies, in changes in health outcomes and in the rational use of medications, especially with regard to their care and clinical activities. On the other hand, Ferreira et al. (2) emphasize that pharmacological interventions in autism aim to treat the symptoms and associated comorbidities, since, to date, there are no medications that can directly address the main symptoms. In addition, they emphasize that the lack of pharmaceutical monitoring can compromise the results for a significant portion of patients. Thus highlighting the implementation of pharmaceutical care programs to fill this gap and provide more holistic and effective treatment, improving the quality of life of individuals with ASD.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Autism; Pharmaceutical Care; Pharmacotherapy.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Screening of Anxiety and Depression in Users of a Basic Health Unit in Santa Maria/RS

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About this scientific work

DOI: 10.62922/4cbffc.cp040
Link: https://doi.org/10.62922/4cbffc.cp040
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Investments in public policies for the treatment of diseases require epidemiological studies that justify and provide information about them (1). to this end, we conducted a screening for anxiety and depression in the primary health care network in the municipality of Santa Maria/RS.

Aim

Conduct screening for anxiety and depression in users served by the health services provided at the Wilson Paulo Noal Basic Health Unit, part of the Public Health Network in the municipality of Santa Maria/RS.

Methods

The sample consisted of users from the Wilson Paulo Noal Basic Health Unit within the Public Health Network of Santa Maria/RS, who were attended during the period from October to December 2023, totaling 88 participants. This study is part of an overarching research project titled “Assessment of the Need for Pharmaceutical Care for Users of the Public Health Network in Santa Maria-RS,” affiliated with the Department of Industrial Pharmacy at the Federal University of Santa Maria and approved by the research ethics committee of the same institution under number CAAE 70008423.4.0000.5346. Information was collected using a pharmaceutical anamnesis form, which included sociodemographic data, clinical history, and social history (2). This data described the population served by the Wilson Paulo Noal Basic Health Unit and was later correlated with validated questionnaires to assess the levels of anxiety (Beck Anxiety Inventory - BAI) and depression (Patient Health Questionnaire-9 - PHQ-9) among the research volunteers (3-4). The data were stored in Microsoft Excel® and statistical analysis was performed using the free software Jamovi® version 2.5.3.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

The results obtained from the questionnaires indicate that the population is dispersed across all levels of anxiety and depression. as a result of the correlations between the pharmaceutical anamnesis and the questionnaires, for both conditions, volunteers with sleep-related issues have higher scores on the BAI and PHQ-9 questionnaires. Additionally, better Quality of Life and General Health Perception on the Visual Analog Scale tend to be associated with lower scores on the questionnaires. Regarding anxiety, volunteers who are already diagnosed with anxiety tend to have higher scores on the BAI questionnaire, and women tend to score higher as well. Those with better family relationships tend to have lower scores, indicating a lower degree of anxiety. For depression, volunteers who engage in physical activity have lower scores on the PHQ-9 questionnaire, as do those with excellent family relationships and those who participate in leisure activities, which are associated with lower scores.

Discussion

Despite the promising results, the research was limited to a small number of participants, and some data could not be used in the statistical analysis due to low frequency or scattered responses. However, the data obtained already provide some insights into the needs for mental health care among the users served by the analyzed Basic Health Unit.

Keywords

Screening in Health; Anxiety; Depression.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Medication Profile of Elderly Residents of an Age-Restricted Condominium in the State of Paraná

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About this scientific work

DOI: 10.62922/4cbffc.cp041
Link: https://doi.org/10.62922/4cbffc.cp041
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

In recent decades, longevity has gradually increased due to the decline in fertility and mortality rates, triggering population aging and new social demands (1). Currently, Brazil has about 32 million of elderly people, comprising the sixth-largest elderly population of the world (2). In Paraná, according to the 2022 census, there are about 1.9 million elderly individuals (3). Concerning housing, the state launched the Casa Fácil Paraná program, as established by State Law N°. 20,394/20. This program aims to benefit low-income elderly people, without their own housing, by constructing gated communities with adapted houses and self-contained infrastructure, including health services, social assistance, and leisure activities (4). Physiological aging increases the prevalence of noncommunicable chronic diseases, such as cardiovascular, dyslipidemia, and diabetes, which are the major cause of mortality in the country (5) and lead to polypharmacy (6). According to the literature, polypharmacy is related to complex

therapeutic regimens, furthering inappropriate medication use and reduced effectiveness (6). It may be considered individualized therapy, when only the necessary medications to treat the pathology are prescribed (7). Pharmaceutical care for the elderly population is extremely important (8). The characterization of medication use is justified by the importance of understanding which drugs are most common among this population, drawing attention to drug interactions and polypharmacy that may occur, which compromise the effectiveness and safety of treatment (9, 10). The analysis of pharmacotherapy in elderly patients is an important tool to qualify the health care of this age group (11). In Brazil, population studies have been conducted on medication use among elderly people, but most have only assessed the use or non-use of any medication on the day of the interview or in the last 15 days (5), highlighting the need for more studies addressing the continuous use.

Aim

The aim of this work is to describe the medication profile used by elderly residents of an age-restricted condominium in the State of Paraná, in order to identify polypharmacy and health care conditions of this age group.

Methods

A descriptive cross-sectional observational study was conducted. The population included in this research was elderly residents of an age-restricted condominium in the city of Jaguariaíva, in the State of Paraná, where extension projects of the State University of Ponta Grossa are located. Inclusion criteria were living in the condominium and agreeing to the terms of the study. Elderly individuals who did not meet the inclusion criteria, refused to participate, or were not able to respond to the questionnaire were excluded. Elderly individuals who were not found at home after three contact attempts were considered as a loss of the study. Data collection was carried out through interviews during home visits between May and June 2024, using a printed questionnaire containing objective and subjective questions, addressing social aspects, clinical data, medications used and sources of access. The data were entered into an Excel spreadsheet for calculating means and frequencies. Medications were classified according to the source of access, such as Basic Component of Pharmaceutical Services and Policies (BCPA), Specialized Component of Pharmaceutical Services and Policies (SCPA) or private system. Polypharmacy was evaluated by the number of medications used, with a cutoff point of five medications (12). All medications reported in the study were classified into therapeutic categories according to their active ingredient, using the Anatomical Therapeutic Chemical (ATC) classification system. This research was approved by the Human Research Ethics Committee of the State University of Ponta Grossa (ethics approval number 6.795.978). The Free and Informed Consent form was presented to the participants, highlighting that participation was voluntary.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Results

Final sample of this study consisted of 32 elderly people, aged 60 years or older, excluding losses and refusals (n=8). The gender distribution was equal, with 50% female and 50% male participants, with an average age of 69 years, ranging from 61 to 89 years. Health problems found in the studied group were: systemic arterial hypertension (84.4%), diabetes mellitus (25%), dyslipidemia/ high cardiovascular risk (37.5%), pain (37.5%), hypothyroidism (21.9%), depression (15.6%), and respiratory problems (9.4%). In order to evaluate the systemic arterial hypertension, 108 pressure measurements were taken, resulting in an average value of 125/76 mmHg. The Body Mass Index (BMI) was calculated, classifying as 40.6% healthy weight, 34.4% overweight, 18.75% class I obesity, and 6.25% class II obesity. Regarding the source of access to medications, 80% of the medicines were obtained by means of Basic Component of Pharmaceutical Services and Policies (BCPA) and 9% by Specialized Component of Pharmaceutical Services and Policies (SCPA), while 11% were obtained from private system. In total, 151 medications were used, with an average of 4.7 medicines per elderly person, ranging from zero to twelve. 50% of the sample were with polypharmacy. The classification of medications according to the first level of the ATC yielded the following 50.33% in level C (Cardiovascular System), 17.88% in level a (Alimentary Tract and Metabolism), 12.58% in level N (Nervous System), 7.28% in level B (Blood and Blood forming Organs), 5.96% in level H (Systemic Hormonal Preparations), 2.64% in level R (Respiratory System), 1.98% in level M (Musculoskeletal System), 0.66% in level J (Anti-infectives for Systemic Use), and 0.66% in level G (Genitourinary System). The most prescribed medications were: losartan, hydrochlorothiazide, and simvastatin.

Discussion

The study obtained a great participation rate, gender distribution was equal and the sample studied was composed mostly of young-old adults. The gender equality in the sample differs from the global scenario, where the elderly female population is predominant, reflecting the feminization of old age (13). The BMI distribution revealed that almost 60% of the elderly were overweight. Obesity is recognized as a multifactorial condition associated with various comorbidities such as cardiovascular diseases, type 2 diabetes, and dyslipidemias (14), is exacerbated by physiological changes associated with aging (15). Systemic arterial hypertension (SAH) was the most prevalent health problem, corroborating with other studies that indicate hypertension as one of the most frequent comorbidities in elderly people (10,15), followed by dyslipidemia/high cardiovascular risk, pain, and diabetes mellitus. The prevalence of hypertension observed in this study is similar to other studies conducted with this population (10,15), with rates of 75.6% and 76.8%, respectively. Despite the high prevalence of SAH, the average blood pressure obtained suggests that the treatment is effective. Pain in the elderly is a common condition, resulting from chronic diseases (neuropathy, arthritis), injuries, and aging, which, like any other disease, requires adequate treatment (16). Regarding prescribed medications, according to the first level of the ATC classification, most medications are used to act on the cardiovascular system, followed by those that act on the digestive system and metabolism, and the nervous system, similar to other studies conducted (1,17). These data reflect the predominance of cardiovascular diseases (10), where the most prescribed medications were losartan, hydrochlorothiazide, and simvastatin (18), respectively. This

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

result is similar to that found by Ribas and Oliveira (11), whose study conducted with 286 elderly individuals at a Basic Health Unit revealed that the most prescribed medications acted on the cardiovascular system, followed by those for the digestive system and metabolism. The outcome that 50% of the elderly studied were in polypharmacy is troubling, since it increases the risk of adverse drug reactions and problems with treatment adherence (6). This result is similar to another study where polypharmacy was observed in 47.20% of the elderly sample (11). The most medications were obtained by the Public Health System, with 89% of medications obtained through the BCPA and SCPA, indicating a significant dependence on the public health system, where access to free medications is essential for adherence to pharmacological treatment, especially in the low-income population (19). The lack of access to continuous drugs can worsen health conditions and increase public spending. The results of this study highlight the complexity of health management in the elderly population, characterized by multiple comorbidities and intensive use of medications. The high prevalence of hypertension, diabetes, dyslipidemia, and polypharmacy requires attention from health professionals, requiring interventions to promote health education, healthy lifestyle habits, and periodic review of pharmacotherapy, aiming to improve quality of life and reduce the risks associated with treatment in the elderly person.

Keywords

Elderly Person; Age-Restricted Condominium; Polypharmacy.

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DOI: 10.62922/4cbffc
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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Potential Drug Interactions in Intensive Care Patients

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About this scientific work

DOI: 10.62922/4cbffc.cp043
Link: https://doi.org/10.62922/4cbffc.cp043
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 30/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Drug interactions occur when a medication alters the activity of another medication, which can occur either through the pharmacokinetic pathway, through the absorption, distribution, metabolism or excretion of another drug; or through the pharmacodynamic pathway, which can be classified as synergistic, additive or antagonistic (1). Therefore, drug interactions can have serious consequences for patients' health. In intensive care unit (ICU) patients, these interactions can be even more worrying due to polypharmacy and serious clinical conditions, which increase the risk of drug interactions (2).

Aim

The aim of this study was to identify the prevalence of potential drug interactions (PIM) in medical prescriptions for patients admitted to the ICU of the João de Barros Barreto University Hospital.

Methods

This was a descriptive and retrospective analytical study of a cross-sectional profile of patients admitted to the ICU of João de Barros Barreto University Hospital (HUJBB), from January to June 2022. The data was obtained through analysis of electronic prescriptions using UpToDate® platform for PIM analysis. The research was approved according to the Research Ethics Committee (CEP), number 4.951.726.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

60 patients were selected, 36 (60%) were male and 24 (40%) were female. The patients' ages ranged between 24 and 91 years with a mean of 58.2 ± 18.8 years. The length of stay varied from 3 to 67 days with an average of 11.4 ± 12 days and mortality rate of 51.67% (N=31). The main reasons for admission to the ICU were conditions of the respiratory system (30%), followed by conditions of the nervous system and post-operative surgery. Of the 60 prescriptions selected, a total of 528 medications were prescribed with an average of 8.8 ± 2.4 medications per prescription. Of the 60 prescriptions, 95% (n=57) presented at least one PIM, a total of 370 PIMs with an average of 6.2 ± 5.3 PIM per prescription. The main drugs involved in PIM were dipyrone (12.93%) followed by fentanyl (8.03%) and furosemide (6.94%). The 3 main PIMs in this study were Enoxaparin and Dipyrone (4.58%) followed by Fentanyl and Midazolam (3.23%) and Furosemide and Dipyrone (2.7%). The main possible effects of PIM observed were Central Nervous System (CNS) depression (24.53%), followed by increased risk of hemorrhage (9.97%) and hyperkalemia (8.09%). Regarding the severity of PIM, the most prevalent was the moderate type (76.28% with the “C” risk classification (61.46%). The second most prevalent severity found was the severe type (18.6%) with the risk classification “D” (15.14%) being the most prevalent within this severity. Risk classification “C” was the most prevalent (65.5%) followed by “D” (29). .65%). Within the “Severe” severity classification, the main PIM was Fentanyl and Midazolam (3.23%) followed by Fentanyl and Ketamine (2.16%).

Discussion

Our study showed that in 95% of prescriptions there was at least one PIM, in addition, there was an average of 6.2 PIM per prescription, a slightly different finding in relation to that of Bakker (3) who observed an average of 2.2 PIM per prescription and in 54.5% of prescriptions there was at least one PIM. This difference may be due to the fact that even though the study population was an ICU, it was conducted in academic, teaching and general hospitals in the Netherlands, which has an admission profile (47.1% for cardiovascular causes) and mortality (12.5%) different from HUJBB, in addition, Dutch prescribers have a database that assists them during the act of prescribing regarding information about medications and drug interactions (3). The main PIM found was Enoxaparin with Dipirone, which corresponded to 4.58%, similar to the results of Cedraz (4), who found 11.11% of PIM between Fentanyl and Midazolam, followed by Dipirone and Enoxaparin. This may be because Dipyrone is widely used in the hospital to control hyperthermia and initial pain management and because Enoxaparin is used at

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

HUJBB for prophylaxis of venous thromboembolism for patients with adequate renal function, since critically ill patients have a greater risk of developing deep vein thrombosis and pulmonary embolism (4,5). Furthermore, the main effect related to PIM was CNS depression in 24.53% of PIM, an effect that for the majority of patients has clinical relevance, but which in critically ill patients in the ICU is usually intentional and with the aim of sedation, to reduce anxiety, reduce stress from mechanical ventilation, and prevent damage caused by agitation (6). In conclusion, it was possible to identify that 95% of prescriptions had at least one PIM. These data show that ICU patients were exposed to several potential health-damaging events. Therefore, the clinical pharmacist's role in the ICU not only helps to identify and resolve drug-related problems, but also improves patients' clinical outcomes, reduces mortality and adverse events, improves safety and promotes rational use of medications.

Keywords

Drug Interactions; Intensive Care; Polypharmacy.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

High-Surveillance Drugs: Physical-Chemical Incompatibilities in an Intensive Care Unit

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About this scientific work

DOI: 10.62922/4cbffc.cp044
Link: https://doi.org/10.62922/4cbffc.cp044
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 30/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

An Adverse Drug Event (ADE) occurs when there is damage the health of a patient undergoing drug treatment. In the hospital environment, adverse drug events (ADE) can also result in longer hospital stays and increased hospital costs. Physicochemical incompatibilities between intravenous medications are examples of ADE that can compromise therapeutic quality and cause harm to the patient (1). There are medications that present a greater risk of causing harm to the patient in the event of errors, known as High-Surveillance Drugs (HSD). Potential Intravenous Incompatibilities (PIC) are adverse drug events that can influence therapeutic quality and are more likely to occur in polymedicated patients, as occurs in the intensive care unit (ICU). Furthermore, there is a predominance of medications administered intravenously, increasing the risk of incompatibility between medications (2).

Aim

To identify physicochemical incompatibilities involving intravenous HSD in hospitalized patients in the ICU of a University Hospital.

Methods

Descriptive, quantitative and retrospective study, consisting of patients hospitalized to the ICU from July to December 2022, according to the research inclusion and exclusion criteria. This research was approved in accordance with the rules of CNS resolution no. 466/2012, with protocol number 6.316.694.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

of the 90 prescriptions selected, a total of 1221 medications were prescribed with an average of 13.56 (± 4.05) per prescription, of which, 438 (36%) were HSD. The most used therapeutic classes were related to the digestive system, metabolism, vitamins and supplements with 312 (25.5%) of the prescribed medications. Regarding PIC involving HSD, in 66 (73%) of the prescriptions, a total of 316 PIC were found with the presence of HSD, with an average of 4.78 HSD per prescription. The most common PIC were: Noradrenaline and Pantoprazole (10.03%), Fentanyl and Pantoprazole (7.52%), and Midazolam and Pantoprazole (7.21%). Regarding the type of intravenous incompatibility, 314 (99%) of the PIC were of the physical type, and only two (1%) were of the chemical type. Therefore, the role of the clinical pharmacist is extremely relevant in preventing PIC, contributing to their identification and ensuring patient safety.

Discussion

In environments such as ICU, where clinical complexity is greater, critical patients have greater exposure to PIC. The majority of PIC identified in this study were classified as physical incompatibilities, which can result in the formation of precipitates, turbidity, color changes, pH changes, gas release, presence of microparticles and reduced drug concentration. Only 1% of PIC were classified as chemical incompatibilities, which can result in reduction, complexation or racemization reactions, and reduce efficacy or increase toxicity. The prevalence of PIC in our study was 73%, with 316 incompatibilities identified, similar to the result found by Marsilio (3), which was 68%. Of the PIC identified, 99% were classified as physical incompatibilities and 1% as chemical incompatibilities. The severity of PIC is influenced by factors such as age, number of medications prescribed, number of therapeutic classes, treatment time and disease status (4). Moraes (5) correlates the greater number and frequency of intravenous medication administration with damage caused by PIC, representing 14% of medication errors in the ICU. In this context, the highest prevalence of PIC found was between noradrenaline and pantoprazole, totaling 10% of all PIC identified. Pantoprazole was the medication most frequently involved in incompatibilities, followed by Midazolam and Noradrenaline. Midazolam was the HSD most associated with PIC, possibly due to its frequent use in ICU, corroborating Castro (6). an effective

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

prevention strategy for PIC is the role of the clinical pharmacist as an integral part of the multidisciplinary team. The analysis of medical prescriptions by the clinical pharmacist contributes to the identification of PIC, ensuring patient safety. In conclusion, based on the analysis of prescriptions, it was possible to identify a high prevalence of PIC related to HSD in patients hospitalized to the ICU. Polypharmacy is a factor that contributes to this high incidence. However, the participation of the clinical pharmacist can contribute to analyzing and identifying PIC and thus ensuring quality and effectiveness in drug therapy.

Keywords

Physicochemical Incompatibilities; Drugs; Patient Safety.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmaceutical Services Provided During the Covid-19 Pandemic

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About this scientific work

DOI: 10.62922/4cbffc.cp046
Link: https://doi.org/10.62922/4cbffc.cp046
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 29/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The first cases of what was believed to be an unknown pneumonia were detected in 2019 in Wuhan, China (1). Due to the high and rapid transmission rate of the SARS-CoV-2 virus, cases soon spread worldwide, leading to outbreaks of severe acute respiratory syndrome and initiating the COVID-19 pandemic, which was declared in 2020 (2). COVID-19 affected the entire population, and healthcare professionals found themselves in an emergency scenario, needing to restructure health systems, control the spread of COVID-19, and save lives (3). Among these professionals, pharmacists assumed a strategic role in patient healthcare by providing pharmaceutical services on the front lines in various health settings, especially pharmacies (4,5). Pharmaceutical services can be understood as a set of technical-managerial or clinical activities related to medications, carried out by pharmacists, aiming to prevent diseases, promote, protect, and restore health, and improve patients' quality of life (6,7). The Brazilian Federal Pharmacy Council recognizes the following clinical pharmaceutical services: (I) Health screening, (II) Health education, (III) Dispensing, (IV) Management of self-limiting health problems, (V) Therapeutic monitoring of medications, (VI) Medication conciliation, (VII) Pharmacotherapy review, (VIII) Health condition management, and (IX) Pharmacotherapeutic monitoring (7). These clinical services, combined with the pharmacists (8) duties, may have contributed to controlling the pandemic and ensuring comprehensive healthcare for society (9). However, few studies, especially scoping reviews, describe the contributions of pharmaceutical services provided during the COVID-19 pandemic (10-13).

Aim

This scoping review aimed to identify and compile scientific evidence available worldwide regarding the clinical services provided by pharmacists during the COVID-19 pandemic

Methods

A scoping review was conducted to identify all studies involving clinical services provided by pharmacists during the COVID-19 pandemic. The study was conducted in accordance with the extension for scoping reviews of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA-ScR) (14). The databases Scopus, Lilacs, and PubMed were used to identify scientific articles using the descriptors: “Pharmaceutical services”, “pharmacist”, “COVID-19”, and “SARS-CoV-2”, combined with the operators AND and OR. The inclusion criteria were: (i) studies involving pharmacists, (ii) providing clinical services, (iii) to patients with COVID-19. Duplicate studies were counted once. Studies without pharmaceutical interventions, systematic reviews, and articles not written in Spanish, English, or Portuguese were excluded. Data extraction considered: authors names, journal and year of publication, location, study design, limitations, and sample size of the studies, pharmaceutical services performed, and results found. Data collection was carried out in databases available on the internet, and approval by the research ethics committee was waived.

Results

This review included 26 studies that met the inclusion criteria. The initial search stage yielded 2,220 articles (4 from Lilacs, 1,432 from Scopus, and 784 from PubMed). After identifying and excluding 637 duplicates, 1,583 studies were screened for the selection phase (4 from Lilacs, 797 from Scopus, and 782 from PubMed). At the start of the article analysis, 1,512 were excluded (1,206 at the title stage and 306 at the abstract stage). Thus, 71 studies were considered for full-text analysis. Of these, 19 were removed for not focusing on pharmaceutical interventions, 10 due to unavailability of the full text, and 16 due to observational methodology without pharmaceutical intervention. In the end, of the 26 studies, 16 were indexed in PubMed, and 10 in Scopus. All articles were published during the pandemic period between 2020 and 2022, mostly in 2022, with 16 studies. The countries with the most publications were the United States of America, with 7 studies, and China, with 4. The main journal published was the Journal of the American College of Clinical Pharmacy, with 3 articles. The predominant mode of care was in-person or hybrid, in 17 studies. Only 9 articles were exclusively remote. The 26 studies revealed in their results the indispensable collaboration of pharmacists through the practice of pharmaceutical services, especially for the prevention and control of the pandemic. In prevention, the highlight in 17 studies was health education interventions, such as medication counseling or scientific information about the pandemic. In control, pharmacotherapy review and therapeutic drug monitoring interventions, in 13 studies, identified and resolved medication-related problems, such as adverse reactions, drug interactions, and the need for dose adjustments in pharmacotherapy.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

The predominance of studies in China and the United States of America is due to the dense hubs of scientific production in these countries during the pandemic (15), with emphasis on China, the main initial epicenter of COVID-19 (16). Regarding study designs, a potential strength of this review is the analysis of only interventional methodologies. This may have allowed for a better assessment of the pharmaceutical services addressed and a more accurate representation of the pandemic context. This characteristic contrasts with other reviews that included theoretical-descriptive studies but also met the needs of professionals during the pandemic. The small sample size, as a primary limitation, may be related to the challenges of conducting science during the pandemic, given the need for social distancing and quarantine measures, as well as the shutdown of educational institutions (17). The pharmaceutical services identified reaffirmed the commitment of pharmacists to the prevention and control of the pandemic. In prevention, the highlight of health education interventions shows the strategic position of pharmacists in combating infodemics and ensuring the rational use of medications by being present in pharmacies, hospitals, and homes (4,5). In control, pharmacotherapy review and therapeutic drug monitoring interventions demonstrated that the direct involvement of pharmacists in predicting medication-related problems and making or advising on dosing regimens suggested clinical improvement of patients during the pandemic. In addition to this improvement, the expansion of pharmaceutical services during the pandemic was also observed, in response to managing pharmaceutical interventions such as: providing disinfectants, masks, and information on preventive measures and social distancing, implementing efficient referral pathways for restructuring services, and assisting in patient treatment by managing supply shortages and therapeutic options (9). It is therefore important to promote the leadership of pharmacists so that both the pharmaceutical services generated during the pandemic and traditional ones are maintained in post-pandemic periods or enhanced for future challenges. Despite the limitations faced in the review process, such as reliance on the availability of up-to-date evidence worldwide, the development of more studies and other reviews on the importance of pharmacists during the COVID-19 pandemic is strongly recommended.

Keywords

Pharmaceutical Services; Covid-19; Review;

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DOI: 10.62922/4cbffc
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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Elaboration of an Immunosuppressive Manual: Potential Drug-Food Interactions

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About this scientific work

DOI: 10.62922/4cbffc.cp047
Link: https://doi.org/10.62922/4cbffc.cp047
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 28/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Interactions between drugs and foods that occur after concomitant ingestion with food can impair absorption, distribution and excretion, which can lead to a failure in the drug treatment, making the process of adaptation of the transplanted organ complicated. This causes injury to the patient who depends on a smooth recovery to avoid complications, since transplantation alone is already a delicate surgical process. Thus, when using an immunosuppressant, it is essential that an investigation is carried out in order to avoid treatment failures or cause toxic effects (1).

Aim

Produce a manual of potential drug interactions of immunosuppressants with food focusing on the safety of transplanted patients. In addition, the idea is to distribute the material among health professionals at the university hospital in order to provide a quick reference material to assist with care.

Methods

The preparation of the manual took place through 4 stages: selection of immunosuppressive drugs standardized in the institution, research in the literature of the main interactions between such drugs and foods (2), structuring and elaboration of the manual through the Excel worksheet. A later phase will be the validation of the material that will have evaluators to judge the relevance of the visual and textual content of the guide through a specific questionnaire. They were used as databases for research, UptoDate ® (3), Drugs.com ® (4), Medscape ® (5), and PubMed ® (6).

Results

Eight immunosuppressive drugs of various pharmacological classes were selected and verified which of them had some interaction with food, after identifying the type of interaction and what clinical management could be performed. Among the immunosuppressants, it was observed that 6 (75%) of them had some interaction with food, and Tacrolimo (the class of calcineurin inhibitors) presented the highest prevalence of interaction with food - among them ethanol, grapefruit juice and food in general - while 2 (25%) of them did not show any interaction. It was also noticed that 4 of the drugs, about 50%, showed interaction with grapefruit juice, occurring mainly the increase in serum concentrations of these drugs.

Discussion

CONCLUSIONS: From the data collection, it was possible to realize that grapefruit, which is a fruit result of crossing two distinct species of oranges (1), is responsible for most interactions and this is because there are compounds in the fruit that inhibit the cytochrome P450, which is an enzyme that will metabolize certain drugs, including immunosuppressants. During the preparation of this material, it was noted the relevance of the immunosuppressive guide for the academic community and health professionals in general, because it is of paramount importance to produce materials that help health professionals to perform the proper guidelines for patients, as well as influence in an efficient care in the medical area. This feature will assist in the quick and easy identification of the main drug-food interactions for transplants, providing a source of safe research, preventing prescription misunderstandings and harm to patients.

Keywords

Food-Drug Interactions; Health Education; Immunosuppressive.

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ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmacological Prophylaxis On Acute Gastric Mucosal Lesion in Patients Undergoing Intensive Care

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About this scientific work

DOI: 10.62922/4cbffc.cp048
Link: https://doi.org/10.62922/4cbffc.cp048
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 27/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Acute Gastric Mucosal Lesion (AGML) or Stress Ulcers (SUs) are lesions that affect the gastric mucosa and can develop in situations of extreme physiological stress, such as sepsis, polytrauma, and severe burns(1). Although the pathophysiology of these lesions is not yet fully elucidated, some hypotheses used by various authors include the occurrence of splanchnic hypoperfusion, microcirculatory impairment, and a pro-inflammatory state(2), which can predispose to the disruption of the gastric mucosal protective barrier, leading to the emergence of SUs. Several factors are associated with the

development of these lesions in critically ill patients, as in the context of organ dysfunction, there is a reduction in gastric mucus and bicarbonate secretion in the intestinal lumen, contributing to the decreased protective capacity of the gastric mucosa, making the body more vulnerable to the onset of AGML(1). Patients requiring intensive care form the most susceptible group to the development of gastric ulcers. In this scenario, the pharmacological prophylaxis of AGML has been incorporated into clinical practice to prevent Upper Gastrointestinal Bleeding (UGIB), which is associated with a higher risk of death and prolonged ICU stay(3). It is estimated that the occurrence of stress-induced bleeding in the Intensive Care Unit (ICU) ranges from 0.6% to 6.0%(4), which represents a significant concern, as this event increases morbidity and mortality rates in hospitals. Considering that prophylaxis can reduce the incidence of gastrointestinal bleeding in patients with severe clinical conditions(2), it is essential to have knowledge about the use of this practice, as the inappropriate use of prophylactic medications is also associated with significant adverse effects and increased costs for healthcare institutions.

Aim

Objective: to analyze the pharmacological prophylaxis of acute gastric mucosal lesion in patients admitted to ICUs of a general hospital in Bahia.

Methods

Method: a descriptive cross-sectional study was conducted. The study was carried out in the intensive care units of a state public hospital in Bahia, and the sample consisted of medical records of patients admitted to ICUs from July to December 2022. The records were selected based on specific criteria. Data were collected through a research form, from which sociodemographic and clinical data were extracted. Some criteria considered for the need for stress ulcer prophylaxis (SUP), according to the main established protocols (5), were: use of mechanical ventilation for more than 48 hours; coagulopathy (INR>1.5; Platelets 2.0); liver or kidney disease; postoperative, especially post liver and kidney transplants; polytrauma; multiple organ dysfunction (SOFA); sepsis; comatose state due to brain injury; major burns; history of gastrointestinal bleeding; chronic obstructive pulmonary disease (COPD); ischemic heart disease, among others. If the patient did not manifest any of these indications, the prophylactic use of medications for stress ulcer was considered inappropriate. Additionally, a risk stratification document for the development of AGML was developed. For descriptive statistical analysis, all collected data were tabulated in Microsoft Excel 2016. For the analysis of the results, the Statistical Package for the Social Sciences (SPSS) was used. For quantitative variables, mean and standard deviation were calculated, and for qualitative variables, relative and absolute frequency distribution were performed. The research was approved by the Research Ethics Committee of the State University of Feira de Santana and has a Certificate of Ethical Appreciation Presentation (CAAE) No. 68266023.3.0000.0053.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Results

A total of 111 medical records were evaluated. The average age of the patients was 58.7 years, with a minimum age of 16 years and a maximum of 91 years. Regarding gender, there was a predominance of males (59.45%). Concerning the education level of patients admitted to the ICUs during the analyzed period, the majority had incomplete elementary education (33.33%). The main diagnoses were ischemic heart disease, representing 13.51% of cases, followed by liver and/or kidney insufficiencies (17.11%) and sepsis (9.0%). Regarding risk stratification, the majority of cases presented a high risk for the development of stress ulcers (59.45%). The main reason found for the use of pharmacological prophylaxis was mechanical ventilation for more than 48 hours, constituting 23.42% of cases. The prevalence of prophylaxis prescription in the evaluated ICUs was 58.55% (n=65). The inappropriate use of medications was observed in 2.7% (n=3) of cases, with recommended but not performed use in 28.82% (n=32) of patients. Regarding the most used medications, Pantoprazole (52.25%) and Omeprazole (6.30%) predominated, both belonging to the group of Proton Pump Inhibitors.

Discussion

The analysis of the data obtained in this research revealed a low occurrence of indiscriminate use of pharmacological prophylaxis, which contradicts most studies pointing to the inappropriate use and lack of appropriate criteria for SUP in patients admitted to intensive care units. It is known that in past decades, all patients admitted to the ICU were treated with AGML prophylaxis, however, with advances in research and the development of new guidelines, prophylaxis is now indicated only for those at increased risk of bleeding, based on randomized studies that demonstrate a reduction in bleeding rates(6). Some current meta-analysis studies have shown that SUP reduces the incidence of manifest bleeding but has no effects on mortality. It is important to consider that although SUP can reduce the occurrence of gastrointestinal bleeding in critically ill patients, it may also be associated with adverse reactions and unnecessary financial costs, so it is important to use this tool only under appropriate recommendations(2). There was a high occurrence of the lack of prophylaxis prescription in patients who met the criteria, which is concerning, as this conduct can increase hospitalization time, the need for blood transfusions, and hospital mortality(6).The probable justification for this occurrence is related to the counterpoints that involve the theme, as older studies state that patients with intermediate or low risk for the development of AGML do not benefit from pharmacological prophylaxis(1). Hospitalized patients with severe clinical conditions or acutely ill need measures to prevent bleeding caused by stress ulcer. Proper management of these patients contributes to the reduction of the incidence of gastric lesions, their bleeding, and the resulting mortality(7). Proton pump inhibitors (PPIs) were used as the method of choice, but their prolonged use requires caution due to the possible association between PPI use and an increase in Clostridium difficile infections and pneumonias in the hospital environment(8). Prophylactic pharmacotherapy is based on the use of H2 receptor antagonists, antacids, cytoprotective agents (Sucralfate), and proton pump inhibitors(8). AGML prophylaxis is widely used in the intensive care units of the analyzed institution and, although irrational use of SUP was not observed, there is a need for intervention measures through the implementation of a well-defined internal clinical protocol with theoretical risk stratification for the appropriate indication of prophylactic drugs, to prevent patients

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

from missing the medication they need. Despite the study presenting limitations inherent to the single-center methodological design, the results obtained reinforce the relevance of promoting the appropriate and evidence-based use of pharmacological prophylaxis for AGML.

Keywords

Prophylaxis; Peptic Ulcer; ICU.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Application of Clinical Pharmacy in Brazilian Oncology Services: an Integrative Review

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About this scientific work

DOI: 10.62922/4cbffc.cp049
Link: https://doi.org/10.62922/4cbffc.cp049
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 26/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Clinical Pharmacy, a practice regulated in Brazil by Resolution No. 585 of August 29, 2013 (1), dedicated to direct patient care, optimization of drug use, and health promotion, plays a crucial role in oncology services due to the complexity of treatments (2, 3). Oncology, involving therapies such as chemotherapy and immunotherapy, requires specialized monitoring to minimize adverse effects and ensure therapeutic efficacy. In Brazil, the inclusion of clinical pharmacists in oncology teams is a growing practice, reflecting the need for safer and more individualized care (3, 4, 5). The prevalence of cancer and

the high associated morbidity rate demand a multidisciplinary approach where the clinical pharmacist is fundamental. This professional contributes significantly to the individualization of therapy, management of adverse effects, and patient education (2, 6). The work of the clinical pharmacist in oncology can result in the optimization of therapeutic regimens, reduction of drug interactions, and minimization of adverse reactions, promoting the rational use of medications and improving patients' quality of life (7).

Aim

The objective of this integrative review is to assess the application of Clinical Pharmacy in oncology services in Brazil, identifying the main activities developed by clinical pharmacists in oncology and evaluating the benefits and challenges of including these professionals in the multidisciplinary team.

Methods

Searches were conducted in the PubMed, Scielo, LILACS, and Google Scholar databases to identify relevant studies published between 2010 and 2024. Search terms included "clinical pharmacy", "oncology", "Brazil", "pharmaceutical care", and "oncology services". Inclusion criteria were studies conducted in Brazil, focused on the work of the clinical pharmacist in oncology, published in Portuguese or English. Review studies, clinical trials, observational studies, and case reports were included. Exclusion criteria were studies that did not directly address the work of the clinical pharmacist or were conducted outside Brazil. Two independent reviewers conducted the study selection and data extraction. Discrepancies were resolved by consensus. The information extracted included study characteristics, activities developed by clinical pharmacists, results, and authors' conclusions.

Results

Fifteen studies were included that met the inclusion criteria. Most studies were literature reviews and conducted in Brazil. The main activities developed by clinical pharmacists included prescription review, therapy monitoring, adverse event management, patient and healthcare professional education, and participation in multidisciplinary committees (4, 8, 9, 10). Prescription review was a highlighted activity, allowing the identification of drug interactions and optimization of therapeutic regimens (9, 10). Continuous monitoring of therapies resulted in the early detection of adverse reactions and implementation of corrective measures, reducing the incidence of serious complications (2, 7). Patient and healthcare team education was essential to increase adherence to treatment and improve understanding of cancer therapies (2, 7, 8, 10). The studies reported several benefits of the work of the clinical pharmacist, including reduced adverse reactions, improved adherence to treatment, optimization of therapeutic regimens, and increased patient safety (2, 3, 4). However, significant challenges were identified, such as lack of institutional recognition, need for greater training and resources, and structural and cultural barriers to the effective integration of these professionals into the healthcare team (11, 12).

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

The review evidenced that clinical pharmacy plays a fundamental role in improving the quality of oncology care in Brazil. The activities of clinical pharmacists, such as prescription review and therapy monitoring, contributed to patient safety, as corroborated by previous studies (2, 4, 6, 9). The early detection of adverse reactions and the continuous education of patients and healthcare teams are crucial aspects that improve adherence to treatment and understanding of therapies, promoting more effective and safe care (7, 8, 13). The challenges identified in the review, such as the lack of institutional recognition and the need for greater training, point to the need for health policies that value the work of the clinical pharmacist (7, 12). Continuous training and investment in infrastructure are essential for the consolidation of this practice. Future studies should focus on strategies to overcome these barriers and improve the integration of the clinical pharmacist into the multidisciplinary team, ensuring the sustainability and effectiveness of oncology services (8, 14). Suggested strategies include the implementation of specific oncology training programs for clinical pharmacists, the development of policies that officially recognize the importance of this practice, and the creation of performance indicators that can objectively measure the impact of clinical pharmacy on patient care (12, 13). In addition, promoting a collaborative environment among healthcare professionals is crucial for the effective integration of clinical pharmacists (2, 7, 10, 15). In conclusion, the application of clinical pharmacy in oncology services in Brazil presents significant benefits for the safety and efficacy of treatment. However, overcoming the identified challenges is necessary to consolidate this practice as an integral part of oncology care. Investments in training, institutional recognition, and health policies that promote the work of the clinical pharmacist are fundamental to guarantee quality care for oncology patients in Brazil.

Keywords

Clinical Pharmacy; Oncology; Pharmaceutical Care.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Training on Technical Prescription Analysis as a Strategy for Safe Dispensation

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About this scientific work

DOI: 10.62922/4cbffc.cp050
Link: https://doi.org/10.62922/4cbffc.cp050
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 25/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

In the context of hospital and clinical pharmacy, the technical analysis of medical prescriptions is an extremely important process, where the pharmacist evaluates dose, route of administration, concentration, dosage regimen, and for injectable medications, dilution and infusion rate, as well as other relevant aspects to ensure the rational use of medications (1,2). The prevention of medication errors should be the primary focus of health professional training institutions, thereby ensuring patient safety. Special attention should be given when dealing with antimicrobials to reduce the burden of resistant microorganisms, and high-alert medications which, if used improperly, can have negative repercussions on patient health (1,2,3). In this context, continuing education is crucial for the ongoing training and updating of healthcare professionals, necessary throughout their years of practice (4).

Aim

To assess the prior knowledge of professionals and interns in a hospital pharmacy regarding the rational use of medications within the context of a training program for technical prescription analysis.

Methods

This was a descriptive, cross-sectional study with a quantitative approach. The study was conducted from April to June 2024 at a university hospital affiliated with the Federal University of Ceará (UFC), in fortaleza, Ceará, Brazil. A training session was conducted for the hospital pharmacy team covering relevant aspects including: dose, infusion time, and concentration of polymyxin B and vancomycin, the use of vancomycin via oral and enteral routes, and the calculation of medication phase changes in infusion pumps, with emphasis on propofol. A pre-test was administered before the training to assess the target audience's knowledge. The training was delivered through presentations by residents who are involved daily in clinical activities within the service. The results were computed and analyzed using Microsoft office Excel® software and presented in percentages and absolute values (n). The project was submitted to the Ethics Committee of the Walter Cantídio University Hospital (CEP-HUWC) via the Brazil Platform and was approved under protocol number 5.409.579 and CAAE number 56178022.9.0000.5045. The study was conducted in full compliance with the ethical principles established in Resolution 466/12 of the National Health Council.

Results

The training had the effective participation of 12 employees, 66.67% (n=8) pharmacists and 33.33% (n=4) pharmacy students. as results of the pre-tests applied, it is inferred that only 9 (75%) had knowledge about the maximum concentration and infusion time of vancomycin, 5 (41.7%) of the participants did not know about the off-label use of oral vancomycin /enteral. Only 3 (25%) knew how to correctly calculate the amount of propofol sufficient to dispense in 24 hours. Through the application of pre-tests, a lack of knowledge among participants was noticed, mainly regarding topics related to the off-label use of oral/enteral vancomycin and the calculation performed for dispensing propofol according to the individualized dose system. In this way, the applicability of the training offered for the training of professionals was verified, aiming at a better quality of the service offered to patients.

Discussion

Health education seeks to train health workers through problem situations that are capable of stimulating professionals' skills to experience the unit's routine(5,6). The exchange of knowledge is very important for the context of continuing education, and it is necessary for all professionals to analyze the scenario in which they are inserted so that searches for demands can be made and improvements implemented(5,6). Local health needs must also be considered to guide continued health training(5,6). The pharmaceutical profession is constantly evolving, the role of the hospital pharmacist goes beyond the dispensing of medicines, which is essential for the patient's pharmacotherapy to be adequate and for the therapeutic results of medicines to be achieved, for this professionals and students need continuous

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

training to monitor the evolution of health technologies and their uses to improve the patient's quality of life(5).

Keywords

Clinical Pharmacy; Continuing Education.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Analysis of User Satisfaction in Public and Private Pharmacies in a Municipality of Espírito Santo

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About this scientific work

DOI: 10.62922/4cbffc.cp051
Link: https://doi.org/10.62922/4cbffc.cp051
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 24/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The evaluation of health services is a very recent systematic practice on the world stage. Currently, surveys carried out for user satisfaction are considered an important indicator of health services, allowing the evaluation of their quality and effectiveness (1). User satisfaction is based on "the individual's subjective perception of the care they receive." Thus, the user's degree of satisfaction or dissatisfaction with the health service may be related to their interaction with the health professional, but it may also be related to aspects of the service infrastructure such as equipment and medicines, amenities such as ventilation and comfort. and their perceptions about the health-disease process (2). The evaluation of health care in public and private institutions is a management strategy to seek the quality of care provided. It is an intentional, technical and political process, which constitutes an ethical and social responsibility. This concern with the quality of the professional-user relationship becomes an

objective to be achieved (3). Pharmacists, as technical managers of community pharmacies, expand their role beyond simply delivering medicines. They can offer clinical services, such as health education, review of pharmacotherapy, management of self-limited health problems, dispensing, pharmacotherapeutic monitoring, among others (4). These aspects make it essential to evaluate the quality of services offered in pharmacies, as well as identify the level of user satisfaction, aiming to identify gaps and guide the improvement of interventions in the search for humanization and continuous improvement of user care.

Aim

This study aims to evaluate the level of satisfaction of users of public and private pharmacies in the municipality of Alegre, located in the southern region of the state of Espírito Santo.

Methods

An epidemiological study with a cross-sectional design was carried out through a household survey in the municipality of Alegre, Espírito Santo, between November and December 2021, during the Covid-19 pandemic. The sample was made up of individuals at least 18 years old who agreed to participate and signed the Informed Consent form (TCLE). The sample selection was carried out considering only the urban region of the municipality. According to the census carried out in 2010, the urban population of Alegre was 21,512 inhabitants, of which 16,179 lived in the municipal seat (5). The sample size was calculated using the municipality's urban population as a reference, which was 21,512 inhabitants, with a confidence level of 95% (error $\alpha = 0.05$), an estimated prevalence of 50% for several study outcomes, and a drawing effect of 1.5. Based on these conditions, the minimum required sample was calculated as 567 individuals, to which an additional 10% was added to compensate for possible losses (6). to carry out the interviews, a structured, pre-coded questionnaire was used, composed of questions, divided into the following blocks: sociodemographic data, use of health services, pre-existing diseases, medications in use and quality of life measured through the European Quality of Life 5 Dimensions 3 Levels (EQ-5D-3L) questionnaire. A descriptive analysis was performed using frequency distribution of sociodemographic characteristics and mean and standard deviation (SD) for continuous variables. to assess the level of satisfaction with health services, the Visual Analogue Scale (VAS) applied to satisfaction was used, considering values from 0 to 10, where 0 (completely dissatisfied) and 10 (completely satisfied). This study was approved by the Research Ethics Committee of the Federal University of Espírito Santo (UFES), under substantiated opinion number 4,732,878.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

The study included the participation of 697 individuals. The average age of those interviewed was 53 years old (SD = 18.9), with the majority being female (72.9%), self-declared white (47.5%), living in the municipality (69.6%) and married (43.3%). Of the total number of respondents, 49.6% declared

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

themselves Catholic, 49.4% had completed secondary education and 47.1% had a monthly income of up to one minimum wage. Regarding clinical characteristics, the majority of participants considered their health status to be very good or good (52.3%), with an average quality of life of 0.862 (SD = 0.173). Among those interviewed, 79.6% had seen a doctor in the last 12 months, 77.4% did not have a private health plan and 35.4% practiced physical activity regularly. Regarding the use of medications, 69.4% said they used medications on their own, with the majority using less than five medications simultaneously (79.8%). Furthermore, 39.7% reported using medicinal plants. The main comorbidities reported by interviewees were high blood pressure (45.1%), anxiety (44.5%) and dyslipidemia (25.1%). Among the research participants, it was found that 53.7% (n= 369) used the services of the basic pharmacy in the city of Alegre, while 87.7% (n= 608) declared having used private pharmacies in the city in the last year. In general, participants who used public and private pharmacies in the last year demonstrated a high level of satisfaction. It was observed that private pharmacies received a better rating from users, with an average of 9.43 (SD = 1.10). The municipality's basic pharmacy had an average satisfaction level of 8.52 (SD = 2.19).

Discussion

The study described the characteristics of individuals who used pharmacies in the city of Alegre, whether public or private. The results indicated a high level of satisfaction with the services provided. Cassaro and collaborators (7) conducted a study with the purpose of evaluating the level of user satisfaction with pharmaceutical services in public pharmacies, observing that the majority of users were satisfied with the services. On the other hand, Bonadiman and collaborators (8) evaluated the level of satisfaction of users of public pharmacies in the metropolitan region of the state of Espírito Santo and found a high level of dissatisfaction on the part of users with the provision of these services. User satisfaction is an important health outcome, but difficult to measure, due to the unique and intangible characteristics of services, whose production occurs simultaneously with consumption. This concomitant nature makes the evaluation subjective, as it seeks to capture the degree of satisfaction with the service received, which cannot be fully known only through direct observation of the service (9). According to Cerdá and collaborators (10), there is a strong correlation between user satisfaction and their health condition. However, as highlighted by Benazzi, Figueiredo and Bassani (11), carrying out a satisfaction survey is complex, as it uses the user's opinion as a tool for evaluating health services. As for sex, there was a predominance of females. The literature indicates that women are more active in health care and are more likely to seek health services (8,12), in addition, women are often who seek medicines for their family (13). Regarding age, an average age of 53 years (SD = 18.9) was observed. A similar study found a predominance of people over 55 years of age, revealing that older individuals are those who most need pharmacy services, with use decreasing as age decreases (13). Regarding education, 49.4% declared that they had completed secondary education. In the study by Santos, Moura and Silva (13), a higher incidence of people with incomplete primary education (32%), followed by incomplete secondary education (28%) and complete secondary education (23%), was observed, with the sum of participants with higher education equal to 17%. According to Mendonça, Guerra and Diógenes (14), patients' satisfaction with the care received can be influenced by sociodemographic factors, with a higher level of satisfaction observed in patients with higher family income. On the contrary, in this study, a high level of

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

satisfaction was observed among those interviewed and the majority had lower income. In conclusion, the results of this research offer valuable evidence about users' high satisfaction with public and private pharmacies during the Covid-19 pandemic. It is important to highlight that evaluating user satisfaction plays an important role in shared decision-making. This assessment provides important information to review professional practices, restructure the work process, allocate resources efficiently, adjust strategies and redefine goals. Thus, it is feasible to ensure quality assistance, in accordance with users' expectations and needs.

Keywords

Satisfação Pessoal; Farmácia Comunitária; Epidemiologia.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Impact of Clinical Pharmaceutical Interventions in Brazilian Hospital Icus: a Systematic Review

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About this scientific work

DOI: 10.62922/4cbffc.cp052
Link: https://doi.org/10.62922/4cbffc.cp052
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 24/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Intensive care units (ICUs) are critical hospital sectors where critically ill patients receive specialized care. Clinical pharmaceutical interventions (CPIs) have demonstrated a crucial role in improving clinical outcomes and patient safety (1, 2). In Brazil, the role of the clinical pharmacist in ICUs has expanded, aligning with international guidelines that highlight the importance of these interventions (3,4). National studies show that CPIs are effective in reducing adverse events, optimizing medication use, and decreasing hospital costs, promoting safer and more efficient healthcare (1, 2, 5).

Aim

To evaluate the impact of clinical pharmaceutical interventions in Brazilian hospital ICUs, focusing on clinical outcomes, reduction of medication-related adverse events, and optimization of hospital resource use.

Methods

A systematic review was conducted based on a search in national databases, including SciELO, LILACS, and Brazilian institutional journals. Studies published between 2010 and 2023 were included, addressing pharmaceutical interventions in Brazilian hospital ICUs. Inclusion criteria considered clinical trials, observational studies, and case reports detailing intervention types, clinical outcomes, and applied methodologies. Study quality was assessed using the Critical Appraisal Skills Programme (CASP) tool. CPIs were classified into categories such as dose adjustment, alternative therapy recommendations, drug serum level monitoring, and patient and healthcare team education. Data were analyzed using descriptive and inferential statistical techniques.

Results

The analyzed studies showed that CPIs in Brazilian ICUs resulted in a significant reduction in medication-related adverse events, ranging from 20% to 40%, depending on the intervention type (1, 5, 6, 7). Dose adjustments and alternative therapy recommendations were the most frequent interventions, followed by therapeutic monitoring and healthcare team education (1, 2, 5,7). In terms of clinical outcomes, there was a reduction in hospital mortality of up to 15% and a decrease in patient length of stay of approximately 2 to 3 days (1, 7, 8). Additionally, significant cost savings were observed in hospital costs, with an average reduction of 10% to 20% in medication expenses (2, 9, 10).

Discussion

The results highlight the positive impact of CPIs on patient management in Brazilian ICUs. The reduction in adverse events and improved clinical outcomes reinforce the importance of integrating the clinical pharmacist into the multidisciplinary team (1, 2, 5, 7). The presence of the clinical pharmacist allows for a safer and more effective approach to drug therapy, promoting rational drug use and individualized therapy (3, 4, 10, 11). Moreover, the reduction in hospital costs associated with CPIs demonstrates that these interventions not only improve quality of care but are also economically viable (9, 10). Effective implementation of these interventions depends on factors such as continuous training of pharmacists, collaboration among healthcare team members, and institutional support (5, 7, 8). Future studies should focus on strategies to overcome barriers to CPI implementation, as well as on long-term evaluation of their impacts on clinical and economic outcomes (9). The consolidation of the role of the clinical pharmacist in ICUs can significantly contribute to improving healthcare quality in Brazil. Clinical pharmaceutical interventions have a significant positive impact on clinical outcomes, patient safety, and hospital costs in Brazilian ICUs. The integration of clinical pharmacists into multidisciplinary ICU teams is essential for optimizing medication use and improving patient care.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Clinical Pharmacy; Intensive Care Unit (Icu); Pharmaceutical.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Evaluation of Clinical Pharmacy Interventions in Four Intensive Care Units of a Highly Complex University Hospital

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About this scientific work

DOI: 10.62922/4cbffc.cp053
Link: https://doi.org/10.62922/4cbffc.cp053
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 23/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The search for quality hospital service and safer patient care has been increasing, especially concerning preventing errors and adverse events (1). In this context, the role of the clinical pharmacist becomes essential, as it can have a positive impact on patient therapy, guaranteeing a safety differential in the care process for hospitalized patients, as well as making a significant contribution to optimizing hospital care and, consequently, improving the quality of pharmacotherapy (2). The American Society of Critical Care Medicine recognizes the clinical pharmacist as an essential component of the intensive care unit

(ICU) team, who cooperates with the excellence of the special care required by patients, recommending the integration of an exclusive pharmacist into their multi-professional staff (3). In 2019, a multicenter study was published that gathered data from 93 ICUs in Brazil and 129,680 patients, which was supported by a machine learning approach, using clustering analysis to process the data. The study concluded that the ICUs in the country with the best results, the lowest mortality rates, the shortest ICU stays, and the shortest durations of mechanical ventilation were those that treated patients based on a combination of three main requirements: 24-hour specialized intensive care medical coverage, a dedicated clinical pharmacist and more autonomous nursing (4).

Aim

To evaluate the interventions carried out by clinical pharmacists in four critically ill units of a tertiary university hospital.

Methods

A prospective observational study was conducted between November 2023 and June 2024. Patients in four intensive care units were monitored by three clinical pharmacists working at the bedside who assessed prescriptions using an electronic prescription system. The following parameters were assessed by the clinical pharmacist: drug interactions with clinical relevance, drug-food interactions, administration of drugs by probes, Y compatibility, drugs requiring photoprotection, drugs interacting with CVP or DEHP, use of antimicrobials, use of anticoagulants and VTE prophylaxis, stress ulcer prophylaxis, risk of QT interval prolongation, checking the dose, dosage, route of administration and indication of drugs, checking the concentration and dilution of drugs administered intravenously, the need to adjust the dose according to renal function and monitoring adverse drug reactions. The pharmaceutical interventions were made during the multidisciplinary rounds or by directly approaching the professional and were recorded on an electronic form designed to record the interventions.

Results

In the course of the study, a total of 6,072 prescriptions were analyzed and 1,008 pharmaceutical interventions were carried out. The types of pharmaceutical interventions and their frequencies are shown in figure 1. These were: 55.3% (n=557) provision of information and education to health professionals in the multi-professional team; 13.5% (n=136) correction of inconsistencies (recommendation/prescription); 10.1% (n=102) correction of instructions for preparation and administration of medicines; 9.8% (n=99) individualization and correction of dosage; 5.8% (n=58) replacement with a safer, more effective, cost-effective or available pharmaceutical form; 3.6% (n=36) discontinuation of medication; 1.2% (n=12) replacement with a safer, more effective, cost-effective or available medication and 0.8% (n=8) initiation of drug therapy. Regarding the acceptability of the interventions, 93.9% (n=947) were accepted and 6.1% (n=61) were not accepted or remained pending.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

Pharmacotherapeutic follow-up can reduce medication error rates by up to 78% (5). The present study demonstrated that the review of prescriptions by the clinical pharmacist remains an important means of detecting and resolving drug-related problems and improving the quality of pharmacotherapy. In our study, 6,072 prescriptions were analyzed, and 1,008 pharmaceutical interventions were carried out. The most common types of interventions were: providing information and education to health professionals in the multi-professional team (55.3%); correcting inconsistencies (13.5%); correcting instructions for preparing and administering medicines (10.1%); and individualizing and correcting dosage (9.8%). Another study that used the same classification for pharmaceutical interventions found the following to be the most common: individualization/correction of dosage (50.38%), suspension of medication (18.97%); replacement with a safer, more effective, cost-effective, or available pharmaceutical form and or presentation (8.04%) and replacement with a safer, more effective, cost-effective or available medication (7.50%) (2). Regarding the acceptability of the interventions, 93.9% (n=947) were accepted and 6.1% (n=61) were not accepted or were pending. an Italian study that evaluated the pharmaceutical interventions carried out by a trained clinical pharmacist in a ward for elderly patients over 70 years old in a university hospital showed that 93.2% of the pharmaceutical interventions carried out over three months were acceptable (6). Thus, it can be concluded that the clinical pharmacy service has detected various problems related to medicines, leading to opportunities to improve pharmacotherapy, in terms of the need for, effectiveness and safety of medicines. It was found that the clinical pharmacist's role in evaluating prescriptions can help improve the quality of pharmacotherapy, as well as patient safety.

Keywords

Pharmaceutical Interventions; Clinical Pharmacy; Safety.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Contributions of Pharmaceutical Services and Policies in Promoting Indigenous Mental Health: an Integrative Review

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About this scientific work

DOI: 10.62922/4cbffc.cp054
Link: https://doi.org/10.62922/4cbffc.cp054
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 20/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

According to the World Health Organization (WHO), the term mental health can be defined as a state of well-being in which an individual is able to perform their abilities, maintain balance in the face of everyday stress, be productive, and contribute to the community in which they are involved. Generally, mental health refers to a condition that presents more than the absence of mental illnesses. The National Policy on Pharmaceutical Services and Policies in Brazil (PNAF) was approved in 2004 through resolution No. 338, characterizing it as a set of actions aimed at the promotion, protection, and recovery of health, both individually and collectively, with medication as an essential input. It aims to ensure comprehensive access to medications and promote their rational use. Thus, Pharmaceutical Services and Policies should cover all Brazilian citizens, who, according to the 1988 Constitution, have the right to comprehensive health, which directly includes the indigenous peoples across the national territory. The rational use of medications is one of the main purposes of Pharmaceutical Services and Policies and is guaranteed by Ordinance No. 254/2002, which establishes the National Policy for Indigenous Peoples' Health Care by the Ministry of Health. It ensures the rational and appropriate use of medications by indigenous populations. In 2010, the Federal Council of Pharmacy recommended the importance of Pharmaceutical Services and Policies in mental health, encouraging the professional class to work in this area and thus contribute to a positive clinical impact, reducing unnecessary expenses, and preventing potential medication-related problems (13). The Ministry of Health recognizes the

vulnerabilities of indigenous populations, such as the abusive and inadequate use of psychotropic medications, highlighting the need to develop specific methods for these interventions, considering the particularities found in each ethnicity (5).

Aim

In this perspective, our aim is to map the scientific literature of a specific area of interest, analyzing and identifying the evidence presented regarding the importance of pharmaceutical care focused on indigenous mental healthNesta perspectiva, temos como finalidade mapear a literatura científica de uma área específica de interesse, analisando e identificando as evidências apresentadas relacionadas a importância da assistência farmacêutica voltada a saúde mental indígena.

Methods

Evidence-based searches for scientific articles were conducted in the Cochrane, Pubmed, and Virtual Health Library (BVS) databases, adopting the following inclusion criteria: full and free access, integrative reviews, systematic reviews, and a timeline of the last 10 years, given the scarcity of studies focused on indigenous health and pharmaceutical care in a correlated manner. The health descriptors used were (“indigenous peoples” OR “indigenous population health”) AND (“Pharmaceutical Services and Policies” OR “pharmaceutical care” OR “pharmaceutical attention”). For the final construction of this work, 7 articles were selected, which met the objective of this research and the adopted inclusion criteria.As buscas de artigos científicos baseados em evidências, foram realizadas nas bases Cochrane, Pubmed e Biblioteca Virtual em Saúde (BVS), adotando os critérios de inclusão: o acesso integral e gratuito, revisões integrativas, revisões sistemáticas, cronologia dos últimos 10 anos, visto a escassez de trabalhos voltados para saúde indígena e assistência farmacêutica de forma correlacionada, os descritores em saúde utilizados foram (“povos indígenas” OR “saúde das populações indígenas”) AND (“assistência farmacêutica” OR “cuidado farmacêutico” OR “atenção farmacêutica”). Para a construção final deste trabalho, foram selecionados 7 artigos, quais contemplavam o objetivo desta pesquisa e dos critérios de inclusão adotados.

Results

Based on the selected studies, it was possible to identify the challenges of promoting mental health in the indigenous context and at the same time highlight the extreme need to do so, given the high demand presented. For example, the Xukuru ethnic group has been suffering from the worsening of mental disorders, mainly related to anxiety and depression, alongside a lack of access to treatment and follow-up for its populations (10). Issues related to self-medication, irrational use of psychotropic drugs, and abandonment of treatment demonstrated the numerous problems related to medications, which can worsen the clinical condition. Additionally, the medical approach has been considered to be focused unilaterally on medicalization. However, it is of utmost importance that the individual has access to comprehensive care from a multidisciplinary team, along with the implementation of strategies to combat mental illness, which should be promoted by the responsible authorities (1,3). The considerable increase in demand related to mental health has been a global challenge, and within indigenous

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

communities, this reality becomes even more challenging, especially due to the numerous and complex factors that influence the suicide of indigenous people. Males aged 15 to 24 years have the highest rates, with contributing factors including financial difficulties, historical and cultural issues, low well-being indicators, family disintegration, social vulnerability, and a lack of sense of life and future (14). A study conducted in the state of Pernambuco highlighted how pharmaceutical care in indigenous health contributes positively to the rational use of medications, achieving a significant 60% reduction in the use of psychotropics. Numbers like these underscore the importance of integrating these professionals into multidisciplinary teams and their contribution to health promotion (13).

Discussion

According to data collected by SINAN between 2011 and 2016, 69 suicide attempts were recorded by indigenous women and 54 attempts by indigenous men, with most occurring in the age group of 70 years old. When comparing the number of suicides during the same period, related to age group, race/skin color, an alarming 44.8% of suicides occurred among the indigenous population, specifically adolescents aged 10 to 19 years. This percentage is eight times higher than that presented among whites and blacks in the same age group. The topic of suicide among indigenous peoples is still rarely addressed, despite its increase across all age groups, revealing to society the need for specific public policies for this population. These policies should address the causes and work on implementing measures to reverse these statistics (1,14). Highlighting the importance of multidisciplinary teams in a mental health-focused approach reveals the noticeable scarcity of these professionals and the limited prevention and awareness actions (10). Additionally, conducting research to identify the reality of irrational psychotropic drug use among the Xukuru population underscores the importance of pharmacists in guiding and monitoring this pharmacotherapeutic process, which should be long-term according to the disorder presented. This generates awareness about the possible consequences of self-medication. One of the main aspects to be debated and addressed is the high rate of psychotropic medication use, mostly practiced irrationally, without medical prescription and supervision by pharmacists. This results in numerous problems, such as worsening clinical conditions, risks of intoxication, and even drug dependence, such as on anxiolytics. This underscores the importance of active Pharmaceutical Services and Policies in prevention policies and follow-up in traditional communities (3,13). Even today, in the year 2024, with the Amazon being a major stage for climate and preservation debates, research related to the mental health of Brazilian indigenous peoples is scarce and limited. This triggers an alert about the neglect and encourages a focus on these populations, who are vulnerable to a high rate of mental disorders and require continuous and effective multidisciplinary Assistance (4). During the development of this research, it became evident that neglect of the mental health of indigenous populations in Brazil still persists, along with the scarcity of research aimed at identifying and addressing these worsening issues over the years. Pharmaceutical Services and Policies presents itself as an essential part of the multidisciplinary team in promoting the mental health of these populations. This requires a special focus from health managers at all levels of government, ensuring the implementation of effective public policies aimed at the well-being and mental health of indigenous Segundo dados coletados pelo SINAN entre os anos de 2011 a 2016 foram registradas 69 tentativas de suicídio por mulheres indígenas e 54 tentativas por parte dos homens com a maior parte da faixa etária

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

entre os 70 anos de idade. Quando se comparou o número dos suicídios ocorridos no mesmo período, ao serem relacionados a faixa etária, raça/cor da pele, obteve o alarmante número de 44,8% ocorreram na população indígena por adolescentes entre 10 anos a 19 anos, porcentagem oito vezes maior que o apresentado entre brancos e negros na mesma faixa etária.
O tema ainda pouco ab

Keywords

Indigenous Health; Pharmaceutical Services and Policies; Mental Health.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Potential Drug Interactions in the Intensive Care Unit

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About this scientific work

DOI: 10.62922/4cbffc.cp055
Link: https://doi.org/10.62922/4cbffc.cp055
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/05/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Drug interactions occur when a medication alters the activity of another medication, which can occur either through the pharmacokinetic pathway, through the absorption, distribution, metabolism or excretion of another drug; or through the pharmacodynamic pathway, which can be classified as synergistic, additive or antagonistic. Therefore, drug interactions can have serious consequences for patients' health. In intensive care unit (ICU) patients, these interactions can be even more worrying due to polypharmacy and serious clinical conditions, which increase the risk of drug interactions.

Aim

The aim of this study was to identify the prevalence of potential drug interactions (PIM) in medical prescriptions for patients admitted to the ICU of the Hospital Universitário João de Barros Barreto.

Methods

This was a descriptive and retrospective analytical study of a cross-sectional profile of patients admitted to the ICU of HUJBB, from January to June 2022. The data was obtained through analysis of electronic prescriptions using UpToDate® platform for PIM analysis. The research was approved according to the Research Ethics Committee (CEP), number 4.951.726. 60 patients were selected, 36 (60%) were male and 24 (40%) were female.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

The patients' ages ranged between 24 and 91 years with a mean of 58.2 ± 18.8 years. The length of stay varied from 3 to 67 days with an average of 11.4 ± 12 days and mortality rate of 51.67% (N=31). The main reasons for admission to the ICU were conditions of the respiratory system (30%), followed by conditions of the nervous system and post-operative surgery. Of the 60 prescriptions selected, a total of 528 medications were prescribed with an average of 8.8 ± 2.4 medications per prescription. Of the 60 prescriptions, 95% (n=57) presented at least one PIM, a total of 370 PIMs with an average of 6.2 ± 5.3 PIM per prescription. The main drugs involved in PIM were dipyrone (12.93%) followed by fentanyl (8.03%) and furosemide (6.94%). The 3 main PIMs in this study were Enoxaparin and Dipyrone (4.58%) followed by Fentanyl and Midazolam (3.23%) and Furosemide and Dipyrone (2.7%). The main possible effects of PIM observed were Central Nervous System (CNS) depression (24.53%), followed by increased risk of hemorrhage (9.97%) and hyperkalemia (8.09%). Regarding the severity of PIM, the most prevalent was the moderate type (76.28% with the “C” risk classification (61.46%). The second most prevalent severity found was the severe type (18.6%) with the risk classification “D” (15.14%) being the most prevalent within this severity. Risk classification “C” was the most prevalent (65.5%) followed by “D” (29). .65%). Within the “Severe” severity classification, the main PIM was Fentanyl and Midazolam (3.23%) followed by Fentanyl and Ketamine (2.16%).

Discussion

It was possible to identify that 95% of prescriptions had at least one PIM. These data show that ICU patients were exposed to several potential health-damaging events. Therefore, the clinical pharmacist's role in the ICU not only helps to identify and resolve drug-related problems, but also improves patients' clinical outcomes, reduces mortality and adverse events, improves safety and promotes rational use of medications.

Keywords

Drug Interactions; Intensive Care; Polypharmacy.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

High-Surveillance Drugs: Physical-Chemical Incompatibilities in an Intensive Care Unithigh-Surveillance Drugs

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About this scientific work

DOI: 10.62922/4cbffc.cp056
Link: https://doi.org/10.62922/4cbffc.cp056
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/05/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

There are medications that present a greater risk of causing harm to the patient in the event of errors, known as High-Surveillance Drugs (HSD). Potential Intravenous Incompatibilities (PIC) are adverse drug events that can influence therapeutic quality and are more likely to occur in polymedicated patients, as occurs in the intensive care unit (ICU).

Aim

To identify physicochemical incompatibilities involving intravenous HSD in hospitalized patients to the ICU of a University Hospital.

Methods

Descriptive, quantitative and retrospective study, consisting of patients hospitalized to the ICU from July to December 2022, according to the research inclusion and exclusion criteria.

Ethics
The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

of the 90 prescriptions selected, a total of 1221 medications were prescribed with an average of 13.56 (± 4.05) per prescription, of which, 438 (36%) were HSD. The most used therapeutic classes were related to the digestive system, metabolism, vitamins and supplements with 312 (25.5%) of the prescribed medications. Regarding PIC involving HSD, in 66 (73%) of the prescriptions, a total of 316 PIC were found with the presence of HSD, with an average of 4.78 HSD per prescription. The most common PIC were: Noradrenaline and Pantoprazole (10.03%), Fentanyl and Pantoprazole (7.52%), and Midazolam and Pantoprazole (7.21%). Regarding the type of intravenous incompatibility, 314 (99%) of the PIC were of the physical type, and only two (1%) were of the chemical type. Therefore, the role of the clinical pharmacist is extremely relevant in preventing PIC, contributing to their identification and ensuring patient safety.

Discussion

With the analysis of prescriptions, it was possible to identify a high prevalence of PIC related to HSD in patients hospitalized to the ICU. Polypharmacy is a factor that contributes to this high incidence. However, the participation of the clinical pharmacist can contribute to analyzing and identifying PIC and thus ensuring quality and effectiveness in drug therapy.

Keywords

Physicochemical Incompatibilities; Drugs; Patient Safety.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Biosocial Profile of Patients with Age-Related Macular Degeneration (AMD) Undergoing Ranibizumab

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About this scientific work

DOI: 10.62922/4cbffc.cp057
Link: https://doi.org/10.62922/4cbffc.cp057
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/05/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Age-related macular degeneration (AMD) or age-related maculopathy is one of the major causes of blindness in people over 55 years of age. The main risk factors for the development of AMD are: smoking, age, diet, white race and female gender, in addition to genetic problems related to mutations in the complement components of the innate immune system, as well as in the extracellular matrix of the choroid. Ranibizumab is a recombinant humanized monoclonal antibody, and has proven, according to some studies, to be safe to use and bringing results in improving visual acuity. It binds to the biologically active receptor and prevents it from binding to the endothelial cell receptor.

Aim

To identify the biosocial profile of patients with AMD undergoing treatment with intravitreal injection (IIV) of Ranibizumab.

Methods

This was a descriptive and retrospective analytical study of a cross-sectional profile. Carried out from March 2021 to January 2022. The research was approved according to the Research Ethics Committee (CEP) with number 62327922.8.0000.0017.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

The research had a sample of 81 patients, who underwent treatment for AMD with IIVs of Ranibizumab. The group whose treatment occurred in only one eye corresponded to 116 patients (73.89%) and the others underwent treatment in both eyes (n = 41; 26.11%). In the present study, 97 eyes were treated, 55 eyes of female patients and 42 of male patients. 291 IIVs were carried out. The overall average number of IIVs per patient was 3.59. Most of these IIVs were applied to women (n = 165; 56.70%). For male and female patients, the average IIVs per patient are 3.50 and 3.67, respectively. Regarding age group, there was a predominance of 60 to 75 years old (n = 63; 77.78%), the majority of them were born in the interior of the state of Pará (n = 40; 49.38%), however they reside in the capital or metropolitan region of Belém 67 patients (82.72%), regarding the level of education, 20 patients did not have completed primary education (24.69%) or education was ignored in more than half of the patient records (n = 42; 51.85%), as well as the profession/occupation of almost all patients was marked in the “ignored” field (n = 78; 96.30%). The majority of patients' marital status is married/stable union (n = 44; 54.32%) and single (n = 20, 24.69%). Most patients are affected by one (n = 30; 37.04%) or two (n = 35; 43.21%) systemic pathologies. Among systemic pathologies, type 2 diabetes mellitus (DM 2) and systemic arterial hypertension (SAH) predominate, either alone or in combination. SAH affects 59 (72.84%) patients and DM 2 affects 36 (44.44%) patients alone or associated with other pathologies. In total, 23 (28.40%) patients have associated DM and hypertension comorbidities, the majority of them female (n = 14; 17.28%). The study revealed a detailed biosocial profile of patients with AMD undergoing treatment with Ranibizumab. There was a predominance of patients aged 60 to 75 years, the majority of whom were female.

Discussion

Therefore, pharmacists are essential in the comprehensive management of patients with AMD, contributing to safety, effectiveness and adherence to treatment with Ranibizumab, in addition to offering educational and emotional support to patients and their families.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Ranibizumabe; Biossocial Profile; Ophthalmology.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Profile of Potential Drug Interactions in Elderly Hospitalized Patientsprofile of Potential Drug Interactions in Elderly Hospitalized Patients

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About this scientific work

DOI: 10.62922/4cbffc.cp058
Link: https://doi.org/10.62922/4cbffc.cp058
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 30/05/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The aging process represents the primary factor in the propensity for the emergence of chronic diseases, which are related to the decrease in the activity of various organs. This allows the use of multiple medications, which may be Potentially Inappropriate for the Elderly (MIPs), whether due to drug interactions or the specific characteristics of changes in the absorption, distribution, metabolism and action of medications in the body of the elderly. The prevalence of interactions increases exponentially with the number of drugs prescribed, mainly associated with the complexity of the clinical features in hospitalized patients. Conditions intrinsic to the patient, such as age, sex and health conditions; and

factors intrinsic to the medicine, mainly the therapeutic index. The presence of one or more drug interaction risk factors increases the complexity of a prescription.

Aim

Therefore, this work aimed to identify the most prevalent Potential Drug Interactions (PIMs) among hospitalized elderly hospitalized patients.

Methods

This is a descriptive, cross-sectional and retrospective study, with a quantitative approach. Approved in accordance with the rules of CNS resolution no. 466/2012, with opinion number 4,951,726. The study was carried out based on the analysis of prescriptions from elderly hospitalized patients in Barros Barreto Hospital, Belém-PA from March to May 2023. The UpToDate® platform was used as a clinical decision support tool.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

During the study period, 70 patients were admitted. In terms of age, the average was 70.8 ±7.3, with a minimum of 60 years and a maximum of 97 years. Regarding comorbidity, 72.86% (n=51) of patients have at least one type of comorbidity and 27.14% (n=19) do not have or have not been diagnosed, the most prevalent are: arterial hypertension (n= 29), diabetes (n=26) and others (n=8). The average length of hospital stay corresponded to 19.23 ±10.8 days, with a minimum length of 1 day and a maximum of 44 days. 70 medical prescriptions were evaluated, resulting in a total of 684 medications and an average of 9.7 ± 3.8 medications per prescription. In total, 64.29% (45) prescriptions had at least one PIM. as a result, 82 PIMs were identified with risk classification n=6) risk in relation to risk classification D, Dipyrone and Enoxaparin are the most involved, in risk classification X, Bromopride is the medication that was present in 83.33% (n=5) of cases.

Discussion

The analysis of prescriptions revealed that 64.29% of prescriptions for hospitalized elderly people presented at least one PIM, with 92.68% classified as moderate risk. The main medications involved were Dipirone, Enoxaparin and Tramadol. It should be noted that a PIM can compromise the effectiveness and safety of the patient, prolong the period of hospitalization, increase hospital costs and, above all, compromise the quality of life of elderly patients. Therefore, pharmaceutical monitoring is essential in prevention and monitoring of therapy.

Keywords

Hospitalized Elderly; Drug Interactions; Health.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Importance of Pharmacist Guidance in the Use of Contraceptives

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About this scientific work

DOI: 10.62922/4cbffc.cp059
Link: https://doi.org/10.62922/4cbffc.cp059
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Hormonal oral contraceptives are widely utilized worldwide due to their effectiveness and reversibility in preventing unwanted pregnancies. Composed of hormones such as estrogen and progestogen, these medications function by inhibiting ovulation and are available in combined or progestogen-only forms, with the combined pills consisting of both hormones and the progestogen-only pills, known as mini-pills, containing solely progestogen (1;2). Their mechanism of action involves altering the neuroendocrine axis, preventing the peak of luteinizing hormone responsible for ovulation, thereby generating a gonadotropic

blockade. Additionally, the increased viscosity of cervical mucus hinders sperm entry, and endometrial atrophy diminishes the conditions for embryo implantation, along with a reduction in the movements of the fallopian tubes (3;4). Since their approval in the United States in 1960, followed by global usage and commercialization in Brazil in 1962, oral contraceptives have been fundamental in family planning and birth control (5). Estimates indicate that approximately 23% of Brazilian women of reproductive age utilize these methods, whereas in developed and developing countries, the percentages are roughly 18% and 75%, respectively (3;1). However, their use may lead to side effects such as headaches, nausea, irritability, weight gain, and cardiovascular complications, with venous thromboembolism, acute myocardial infarction, and stroke being the most concerning (2;4;1). Women predisposed to cardiovascular diseases exhibit a greater susceptibility to arterial thrombosis when using hormonal contraceptives. The pharmacist plays a crucial role in patient guidance. Health education provided by pharmacists contributes to improving therapeutic adherence, promoting the rational use of medications, preventing adverse events, and ensuring greater safety and efficacy in treatment.

Aim

This study aims to delineate the side effects associated with the continuous and prolonged use of hormonal oral contraceptives, highlighting the importance of pharmaceutical care in promoting the health and well-being of users. Furthermore, it seeks to observe the impact of pharmaceutical care in monitoring these patients, with the goal of enhancing quality of life, increasing therapeutic adherence, and reducing adverse effects through the interventions conducted.

Methods

To achieve the proposed objectives, an integrative literature review was conducted, adopting a comprehensive and inclusive approach to synthesize evidence. The databases used included PubMed, Google Scholar, and Scielo. The search terms employed were "contraceptives," "contraceptives," "clinical pharmacy," "pharmacist's role in contraceptive use," and their respective variations. The inclusion criteria were: studies addressing the pharmacist's role in contraceptive use, articles published in English, Portuguese, or Spanish, and studies with full text available. Studies that did not highlight the pharmacist as a protagonist in contraceptive use and those that did not mention medication errors were excluded. A narrative and descriptive approach was employed for data synthesis, integrating the results of the selected studies. This method allowed for a comprehensive view of the pharmacist's role in preventing medication errors.

Results

Some articles show that the use of contraceptives, especially combined ones, when associated with smoking, hypertension, systemic lupus erythematosus (SLE), migraines, and a history of stroke, has a higher likelihood of developing thromboembolic events such as stroke. Despite advancements in technology by the pharmaceutical industry, this occurrence continues to be reported, with an increase (from 4 to 8 times) in the incidence of thromboembolism in women using contraceptives (7;11). In addition to thromboembolic events, contraceptives can cause dizziness, nausea, headaches, irritability,

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

myalgia, vomiting, increased appetite leading to weight gain, hair loss, and changes in sexual appetite (8;13). Other studies indicate that the use of combined oral contraceptives has been increasing in Brazil. Data from the National Demographic and Health Survey of Children and Women (PNDS), conducted in 2006, revealed that 24.7% of women in union used contraceptives as a method of birth control. This represents an increase of 4.0% compared to the percentage found in the 1996 PNDS, when the use of this method among women in union was 20.7% (9) Numerous articles present pharmaceutical care as a set of actions carried out by the pharmacist aimed at preventing, discovering, and solving medication-related problems. Counseling on medication use is part of the pharmacist's responsibilities and can contribute to reducing inherent risks, as well as promoting the effectiveness and safety of medication usage, through a holistic view of all factors that may influence contraceptive use (9;10;15). Recently, the Federal Pharmacy Council made pharmacists qualified professionals to prescribe contraceptives and approved a protocol that guides pharmacists on the proper way and recommendations for prescribing hormonal contraceptives, considering risk factors and associated health conditions. This aims to improve the quality of life of users and prevent possibl

Discussion

The use of contraceptives is relatively recent in history and has become increasingly common, especially as women begin to have active sexual lives at a younger age. Currently, there is a wide variety of contraceptives with different dosages, and most do not require a prescription, leading many women to start using them based on recommendations from friends and/or family. This practice, which is very common in Brazil, can lead to various side effects, as estrogen and progesterone affect multiple systems in a woman's body, such as the endothelial system. Therefore, the introduction of contraceptive use should consider all facets of the individual who will use them (6). It is well established that using contraceptives without proper guidance can pose several risks. For instance, for women suffering from migraines, using combined contraceptives is not ideal, as they may exacerbate the condition and increase the risk of stroke (1). It is also known that many women in social vulnerability do not have access to specialized medical services and therefore seek pharmacies to acquire contraceptives, seeking guidance from pharmacists or recommendations from others. Furthermore, many do not receive the necessary follow-up to verify the effectiveness of the contraceptive or whether it's causing undesirable effects, nor do they know that some side effects may be caused by contraceptive use (17). as the demand for contraceptives occurs mainly in pharmacies, pharmacists need to be equipped to ensure proper dispensing of the medication (18). The professional should conduct a thorough anamnesis to identify possible risk factors and provide the most suitable medication to the patient, considering their socioeconomic situation. With the new contraceptive protocol, pharmacists now have a guide that allows them to make safe decisions and provide better quality of life to users, aiming to avoid side effects and, in the long term, possible severe damage (16). Among the key points discussed in the contraceptive protocol, there are a series of questions that guide the anamnesis, leading the pharmacist to gather general information, such as height, weight, and whether the patient believes she is pregnant, in addition to investigating clinical history, such as the likelihood of developing or having had thrombosis, hypertension, diabetes, migraines, bleeding, among other factors (16;12). It is concluded that the pharmacist's role is of utmost importance for contraceptive use (14), as they can operate on multiple

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

fronts, from dispensing to pharmaceutical follow-up, ensuring the effective treatment and prevention of adverse events. With the introduction of the contraceptive protocol, pharmacists gain autonomy to manage therapy. However, it is necessary for professionals to receive training to become increasingly qualified and provide the best care to patients.

Keywords

Clinical Pharmacy; Prevention; Contraceptive; Pharmaceutical.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Current Approaches to Managing Type 2 Diabetes in Adults: a Literature Review

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About this scientific work

DOI: 10.62922/4cbffc.cp060
Link: https://doi.org/10.62922/4cbffc.cp060
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 13/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Type 2 diabetes mellitus (T2DM) is a chronic disease characterized by insulin resistance and relative insulin deficiency. The global prevalence of T2DM is rapidly increasing due to factors such as physical inactivity, poor diet, and rising obesity rates. Effective management of T2DM is essential to prevent microvascular and macrovascular complications, including retinopathy, nephropathy, neuropathy, and cardiovascular diseases (1-5). Management strategies include lifestyle intervention, pharmacotherapy, glycemic monitoring, and health education. As treatments and clinical guidelines evolve, it is crucial to assess the most recent and effective approaches to treating T2DM in adults (1,6).

Aim

To evaluate current evidence-based approaches to managing Type 2 Diabetes in adults, with a focus on lifestyle interventions, pharmacological therapies, and glycemic monitoring.

Methods

A literature review was conducted using databases such as PubMed, Scopus, and UpToDate. Keywords included “type 2 diabetes,” “management,” “drug therapy,” “lifestyle intervention,” and “blood glucose monitoring.” Studies published in the last 10 years were included to ensure that the information was relevant and timely. Priority was given to peer-reviewed articles, clinical guidelines, and randomized clinical trials. Studies were selected based on their relevance to the management of T2DM in adults, excluding studies involving pediatric populations or non-diabetes-related comorbidities.

Results

Lifestyle interventions, including diet and exercise, remain the cornerstone of T2DM management, with robust evidence supporting their efficacy in improving glycemic control and reducing complications (6,7). Pharmacotherapy, particularly the use of metformin as a first-line treatment followed by SGLT2 inhibitors, GLP-1 agonists, and insulin in more advanced cases, has shown significant effectiveness in reducing HbA1c and preventing complications (2-4). Recent studies highlight the cardiovascular benefits of SGLT2 inhibitors and GLP-1 agonists, leading to a shift in guidelines to include these agents for patients at high cardiovascular risk (3,4). Additionally, continuous glucose monitoring and the use of technologies such as insulin pumps and continuous glucose monitors are gaining traction as important tools in the intensive management of T2DM (5).

Discussion

Managing T2DM in adults requires a multifaceted approach that includes lifestyle interventions, personalized pharmacotherapy, and continuous monitoring. Current evidence suggests that metformin should remain the first-line treatment due to its efficacy, safety, and low cost (2,3). However, the use of SGLT2 inhibitors and GLP-1 agonists is associated with additional benefits, particularly for patients at high cardiovascular risk, representing a significant advancement in management strategies (3,4). Continuous glucose monitoring, although more intensive, can offer benefits in terms of glycemic control and quality of life, especially when combined with advanced technologies (5). Adherence to treatment, patient education, and psychological support are essential components for long-term success in managing T2DM (6).

Keywords

Clinical Pharmacy; Diabetes.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Challenges and Solutions in Adherence to Pharmacotherapy

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About this scientific work

DOI: 10.62922/4cbffc.cp061
Link: https://doi.org/10.62922/4cbffc.cp061
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 24/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The adherence to pharmacotherapy occurs through the act of using the correct medication for a specified duration, with the aim of positively influencing the clinical condition and achieving treatment effectiveness. It is well-known that there are several challenges related to medication adherence, including difficulties in accessing medications (1), the complexity of dosing regimens, unwanted side effects, and patient misunderstanding or forgetfulness. These challenges can perpetuate negative implications for an individual's physical and mental health, compromising recovery and quality of life (2). Additionally, socioeconomic, cultural, and educational factors also play a significant role in treatment adherence. In light of this, solutions that facilitate adherence include educational interventions,

improved communication between patients and healthcare professionals, and the implementation of supportive technologies such as electronic reminders and monitoring apps (3). With a multifaceted approach, we can enhance pharmacotherapy adherence and, consequently, improve clinical outcomes for patients.

Aim

In this study, we aimed to assess and discuss the challenges and solutions related to pharmacotherapy adherence. We identified factors that hinder adherence, analyzed their impact on patients' health, reviewed existing strategies, and proposed novel approaches to enhance adherence, emphasizing the crucial role of healthcare professionals.

Methods

for this study, an integrative approach to literature review was employed. This methodology allows for the inclusion of diverse data sources and study types, providing a comprehensive view of the topic at hand. The search was conducted in the SciELO, PubMed, and MedScape databases, known for their relevance and coverage of articles and scientific journals in the field of health. Initially, inclusion and exclusion criteria for studies were defined. Articles published in the last ten years, written in both Portuguese and English, addressing challenges and solutions related to medication adherence were included. Studies lacking concrete data on treatment adherence or not available in full were excluded. The database search utilized combinations of keywords and specific terms related to the topic, such as "medication adherence," "barriers to adherence," "interventions to improve adherence," and "supportive technologies for adherence." Article selection occurred in two stages: first based on titles and abstracts, followed by a thorough reading of the selected texts. In addition to analyzing individual studies, thematic syntheses were conducted to group the main challenges and solutions identified in the literature. Effective interventions were categorized, including educational interventions, technology utilization, improvements in communication between patients and healthcare professionals, and organizational changes within the healthcare system.

Results

The results of this study revealed several significant barriers to correct medication adherence, which are common across various studies. Many patients reported difficulties in obtaining prescribed medications due to financial, geographical, or logistical issues. These access challenges pose a significant obstacle to treatment adherence (4) . Furthermore, the presence of multiple diseases (multimorbidity) and concurrent use of various medications (polypharmacy) further complicate treatment adherence. This scenario increases the likelihood of drug interactions and adverse effects, making therapeutic regimen management more challenging. It was identified that a significant proportion of patients use medications that may not be ideal for their conditions, known as potentially inappropriate medications (PIMs) (5). The use of these medications increases the risk of adverse effects and may compromise treatment efficacy. Another significant factor impacting treatment adherence is medication side effects. Many patients discontinue medication use due to unwanted side effects, negatively affecting their quality of life and

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

reducing confidence in the treatment. Additionally, the relationship with healthcare professionals plays a crucial role. Lack of effective communication and follow-up by healthcare providers contributes to low adherence, as patients often do not receive proper guidance on how to use medications correctly (6). These barriers identified in the study align with existing literature, which highlights a high prevalence of difficulties in adhering to proper medication use. Identifying these challenges is essential for developing strategies that can improve adherence and, consequently, therapeutic outcomes.

Discussion

The results presented are consistent with several studies that indicate a high prevalence of difficulties in correctly adhering to medication use. The identified barriers, such as access difficulties, multimorbidity, polypharmacy, use of potentially inappropriate medications, adverse effects, and problems in the patient-professional relationship, are well-documented in the scientific literature. These barriers reflect complex and interconnected challenges that affect medication adherence (7;8). Studies suggest that active adherence monitoring can be an effective solution to overcome these barriers. Implementing systems that closely track patients' medication use allows for rapid interventions when necessary, increasing the likelihood of continuous adherence (9). Additionally, providing clear and reliable information to patients on how to use medications correctly is essential. Patient education, including detailed guidance on medication administration, can significantly improve treatment adherence (10). Another important aspect is assessing patient resources. Considering whether patients' financial and logistical resources are sufficient to acquire necessary medications is crucial for ensuring treatment continuity. offering financial or logistical support, when needed, can alleviate the burden of access difficulties and improve adherence (11). Optimizing pharmacotherapy is another essential strategy. Regular review of polypharmacy regimens can ensure that patients are using only essential and appropriate medications, reducing the risk of drug interactions and adverse effects (12). In summary, the scientific literature indicates that while complete adherence to pharmacotherapy faces significant challenges and represents a public health issue, effective interventions can lead to satisfactory therapeutic outcomes. Implementing these strategies can significantly enhance patients' access and adherence to their treatments, promoting better clinical outcomes. This study aims to raise awareness of these aspects and advocate for actions that aim to ensure adherence to pharmacotherapy and reduce the encountered challenges.

Keywords

Adherence; Pharmacotherapy; Challenges; Pharmacotherapeutic Follow-Up.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Importance of Pharmaceutical Care in the Treatment of Polymedicated Elderly Patients

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About this scientific work

DOI: 10.62922/4cbffc.cp062
Link: https://doi.org/10.62922/4cbffc.cp062
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 26/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Since the 1960s, Brazil has undergone significant sociodemographic changes, notably the aging population as a primary factor (1). This increase in the elderly population has led to epidemiological shifts, replacing acute illnesses with chronic diseases as the leading causes of morbidity and mortality. Consequently, there has been a substantial rise in healthcare demand and medication consumption among the elderly, contributing to the practice of polypharmacy in this age group (2;3). Polypharmacy among the elderly is common due to the high prevalence of chronic conditions. However, it can lead to drug interactions and adverse effects, compromising the health and quality of life of the elderly. Clinical interventions by pharmacists in elderly patients have shown to enhance therapy outcomes, adjust dosages, and reduce costs, thereby promoting more effective care. Additionally, pharmacists play a crucial role in reducing the risk of drug interactions through pharmacotherapeutic monitoring (4). With the evolution of Pharmaceutical Care and the prominence of Clinical Pharmacists, through dispensation

with guidance and pharmaceutical consultations, significant value has been demonstrated in promoting rational drug use among the elderly, aiming to improve their quality of life (5). Pharmaceutical care can play a crucial role in promoting rational drug use, enhancing therapeutic adherence, and reducing adverse events (4;6).

Aim

Therefore, this study aims to evaluate the importance and impact of pharmaceutical care in the treatment of polymedicated elderly patients, aiming to improve quality of life and therapeutic safety. Specifically, it seeks to analyze the effects of pharmaceutical care on therapeutic adherence among elderly patients and assess the reduction of adverse events related to polypharmacy following pharmaceutical interventions.

Methods

This study employed an integrative literature review to assess the importance and impact of pharmaceutical care in the treatment of polymedicated elderly patients. This method was chosen for its ability to provide a comprehensive and critical view of the current knowledge on the topic. Specific research questions were formulated to guide the literature search and analysis, focusing on the benefits of pharmaceutical care, reduction of adverse events, and improvement of therapeutic adherence. Literature search was conducted in electronic databases including PubMed, Scopus, Web of Science, and SciELO, using search terms such as "pharmaceutical care," "elderly patients," "polypharmacy," "therapeutic adherence," and "drug interactions." the quality of included studies was assessed using specific criteria for integrative reviews, such as clarity of objectives, methodological robustness, relevance of results, and applicability of conclusions. Critical analysis was conducted to identify gaps in the literature, compare findings across different studies, and contextualize results in the current pharmaceutical practice scenario. Discussion included interpretation of results, implications of findings for clinical practice, and recommendations for future research.

Results

Studies conducted by Campins et al. (2017) involving 503 patients and 2709 prescriptions revealed that approximately 26.5% of these prescriptions were potentially dangerous, and 21.5% required changes such as discontinuation, dose adjustment, substitution, or new prescription. Through pharmaceutical interventions and pharmacotherapeutic monitoring, there was a significant reduction in the average number of prescriptions per patient (7). Furthermore, studies by Bellver, Moreno, and Salar (2018) demonstrated that detailed prescription analysis and pharmaceutical interventions resulted in cost savings for patients. In a study involving 88 patients, it was found that 33% of prescriptions were potentially inappropriate, with 36% requiring pharmaceutical intervention. By the end of the study, pharmaceutical intervention led to savings of over six euros per patient (8;9). Another study highlighted the pharmacist's role in improving therapeutic adherence among elderly patients. In a sample of 154 patients, there was a 7.6% improvement in therapeutic adherence after the introduction of Pharmaceutical Services and Policies (10). Additionally, research by Castelino et al. (2010) involving 800

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

polymedicated elderly patients demonstrated that pharmaceutical interventions reduced the incidence of adverse drug reactions (ADRs) by 22%. This study also noted that 15% of patients required dosage adjustments to avoid potential ADRs, underscoring the importance of continuous and personalized pharmacist monitoring to minimize risks and optimize drug therapy (11).

Discussion

The presented results indicate that pharmaceutical interventions play a crucial role in optimizing drug therapy in polymedicated elderly patients. Studies such as those by Moura et al. observed significant improvements in therapeutic adherence and highlight the health benefits and quality of life improvements for elderly patients due to pharmaceutical interventions (10). These interventions, characterized by guidance and continuous monitoring, promote health education, enabling rational drug use and minimizing risks associated with polypharmacy and self-medication. This educational process is essential for enhancing patient and caregiver understanding of treatment, resulting in reduced adverse events and enhanced therapeutic safety (12). Castelino's review reinforces the importance of targeted pharmaceutical services for suboptimal prescribing in the elderly, emphasizing the reduction of adverse drug reactions (ADRs) and necessary dosage adjustments to avoid potential ADRs. Pharmaceutical interventions not only save financial resources but also promote safer and more efficient healthcare. This aspect is crucial for the elderly population, who often contend with multiple comorbidities and, consequently, multiple medications (11). The findings are also consistent with Bandeira et al., highlighting the economic and social gains from active pharmacist involvement in elderly care (13). This observation stems from the fact that when pharmacists provide correct dispensation, guidance, and patient history taking, they often identify socioeconomic and other social determinants of health present in their lives, allowing for a broader intervention based on all these aspects. In this sense, higher quality healthcare can be offered to socioeconomically disadvantaged individuals, reducing inequalities. Thus, the pharmacist's role is crucial in ensuring constitutional and citizen rights such as health and human dignity (14,15). It is evident that the importance of pharmaceutical care in the treatment of polymedicated elderly patients is unquestionable. Pharmaceutical interventions not only improve therapeutic adherence and reduce adverse drug reactions but also address socioeconomic and social determinants of health, promoting a holistic and personalized approach to care. This work highlights how proactive involvement of pharmacists, in collaboration with other healthcare professionals, is essential to ensuring the safety, efficacy, and quality of life of elderly patients. Investing in pharmaceutical care programs and health policies that recognize this contribution can result in substantial benefits for both patients and the healthcare system. Future studies should continue to explore and validate these interventions, expanding our knowledge and continually improving pharmaceutical care practices. This will enable the promotion of healthier and more dignified aging for the elderly population, ensuring a lasting positive impact on public health.

Keywords

Pharmaceutical Care; Polymedicated Elderly.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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doi:10.1177/0897190011433740

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Quality of Evidence-Based Clinical Guidelines in Pharmaceutical Practice

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About this scientific work

DOI: 10.62922/4cbffc.cp063
Link: https://doi.org/10.62922/4cbffc.cp063
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 27/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Clinical guidelines are informative documents that contain the necessary recommendations to optimize patient care. These guidelines are based on scientific evidence and the evaluation of the benefits and harms of different health options (1). By protocoling and defining such documents, it contributes to the adoption of better health outcomes in the population, as well as reducing the divergences that occur between the multidisciplinary health team (2). Evidence-based clinical guidelines for the Unified Health System (SUS) were named and protocoled in 2011, according to Law No. 12,401 (3). Clinical guidelines

evaluate the efficacy, safety, effectiveness, and cost-effectiveness of health interventions at different stages of the disease and/or health condition addressed in this document. The lack of guidelines, the quality of the documents, and professional training for the Pharmaceutical Care to be systematized, together with professional insecurity, reflects on the performance of professionals. There is a need for standardization of conduct and the creation of protocols (4). In view of this, the pharmacist is indispensable in the creation and implementation of these protocols, which help benefit the patient, promoting the rational use of medicines, reducing costs and medication errors and optimizing safety and efficacy. In addition, of the existing guidelines, it is necessary to evaluate the quality of the documents already produced.

Aim

This work investigates and evaluates the approaches established by clinical guidelines, verifying their effectiveness and possible compromises in pharmaceutical care aimed at patient health. It includes identifying guidelines and analyzing their success in the pharmacist's clinical practice. The ultimate goal is to ensure that these documents are effective, promoting efficient management and a systematic and effective approach in the pharmacist-patient relationship.

Methods

This is an integrative review that collected data from scientific articles in order to analyze the quality of clinical guidelines directed at various diseases that affect patients. From this analysis of the quality of the guideline, the role of the pharmacist in the midst of these protocols was also observed. For this, tools were used to use as a database, such as: National Library of Medicine (PubMed/Medline), Virtual Health Library (BVS) and Google Scholar. For the search, the following keywords were used: "Clinical Guidelines", "Pharmaceutical Practice", "Scientific Evidence", "Pharmacotherapy". Ten articles dated from the last five years were used. These articles were selected based on the abstract, those articles that addressed the topics related to the research were included in the systematic review, in English and Portuguese. Not referring to or not being aligned with the theme proposed by the research was an exclusion criterion during the selection of articles.

Results

The integrative review included studies that highlight the importance of protocoled clinical guidelines and the evaluation of the quality of these guidelines to assist patients with different diseases. In addition, the review aimed to evaluate the provision of pharmaceutical services in these different contexts, aiming to effectively meet the needs of these patients. Clinical guidelines make patient care practices more homogeneous and based on high-quality scientific evidence. Evaluating the quality of the recommendations made is of paramount importance to avoid the application of low-quality scientific protocols (5). Most of the articles read for inclusion used the Appraisal of Guidelines Research and Evaluation (AGREE II), an international tool that assesses the methodological rigor and transparency with which these protocoled documents were developed (6). The use of a systematic and transparent approach in judging the quality of evidence reduces and avoids bias in clinical practice. In addition, this

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

approach facilitates the critical evaluation of information and improves communication between healthcare professionals (7).

Discussion

The integrative review revealed the existence of several models of clinical guidelines; however, many of them do not reach the necessary quality to serve as models of clinical practice for the pharmacist. The articles evaluated explored different clinical guidelines protocoled for specific diseases and analyzed the role of the pharmacist in the context of these guidelines. Among the ten articles analyzed, only five presented a good delineation in the recommendations and established items, thus achieving a satisfactory quality. Of these five, one article stood out for not only presenting the protocoled documents, but also for the investment and maintenance of online platforms, providing a continuous and updated resource for professionals in the area (8). The other five remaining articles did not present good quality and did not even address the care focused on pharmaceutical care. The documents have undergone significant changes in recent decades, which, depending on the problem, present significant opportunities for improvement in patient health, promoting relief and comfort (9). In addition, Brazilian clinical guidelines can be mirrored in guidelines from other countries, which evidence other methodologies and quality in evaluations, depending on which pathology and evaluation they have (10). In addition to pharmacological interventions, the pharmacist is able to follow the guideline and apply non-pharmacological interventions in order to direct the patient towards health promotion (11). Some Brazilian guidelines seem to be well delineated in the global aspect, not differing from the international ones, demonstrating the importance of a standard method (12). Consolidating these implementation and standardization processes is crucial for the development of systematic and generalizable strategies in the application of health technologies. This is especially important considering that 66.1% of the guidelines have scarce citations for their implementation in the Unified Health System (SUS) (13). Clinical pharmaceutical interventions reduce medication errors and improve therapeutic outcomes (14). to reduce the number of errors in clinical guidelines, the pharmacist should act directly in the production of these documents and in reviews, thus reducing bias and increasing the quality of multiprofessional care. By establishing clear and well-founded guidelines, it is possible to ensure that healthcare professionals have access to up-to-date and relevant information for clinical practice, thus, by improving the quality of documents and promoting evidence-based practice, it is possible to optimize patient health outcomes and ensure more effective and safe care.

Keywords

Clinical Guidelines, Pharmaceutical Practice, Pharmacotherapy.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Medication Use Profile in Newly Transplanted Kidney Recipient Patients at the Time of Hospital Discharge

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About this scientific work

DOI: 10.62922/4cbffc.cp064
Link: https://doi.org/10.62922/4cbffc.cp064
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 02/10/2024; Published: 03/10/2024.

Introduction

Patients undergoing kidney transplantation use immunosuppressants in the post-transplant period to prevent or treat rejection of the transplanted organ, which is considered the main cause of graft loss. In addition, drugs from several different classes are part of the daily lives of these patients, who may have numerous comorbidities, and the importance of these drugs is directly associated with the patient's representations of autonomy and quality of life, reinforcing adherence to treatment (1). Pharmaceutical guidance at hospital discharge is an important stage in the transition of care to the home environment

and contributes to the rational use of medicines by promoting adherence to treatment, reducing adverse reactions and contributing to the development of patient empowerment and self-care, reducing hospital readmissions and mortality, especially in the case of polymedicated patients (2,3). Thus, knowledge of the profile of medication use is essential, enabling better management of pharmacotherapy, contributing to successful continuity of treatment and transplantation, thus improving clinical outcomes.

Aim

To describe the profile of medication use in newly transplanted kidney recipients in a high-complexity hospital at the time of hospital discharge.

Methods

This is a retrospective and descriptive study, with quantitative data analysis, collected from institutional indicators and records of discharge medication plans of patients admitted to a transplant unit of a high-complexity hospital from January to December 2023, available on Google Drive® of the transplant clinical pharmacy unit. The average and prevalence of prescribed medications were evaluated. Research was submitted to and approved by the Ethics and Research Committee of the Hospital Universitário Walter Cantídio linked to the Universidade Federal do Ceará (HUWC/UFC) under opinion 5. 409.579 and Certificate of Submission for Ethical Appraisal (CAAE) n° 56178022.9.0000.5045.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

In the year 2023, a total of 86 discharges with pharmaceutical guidance were obtained in the transplant ward, of which 65.12% were in renal transplantation. The pharmacotherapy prescribed at hospital discharge averaged 11.5 drugs per patient, including immunosuppressants (tacrolimus, sirolimus, mycophenolate sodium, and prednisone), prophylaxis (omeprazole, sulfamethoxazole+trimethoprim, nystatin, isoniazid, pyridoxine, albendazole, ivermectin, and secnidazole), and antihypertensives were predominantly used, and it can be concluded that kidney recipient patients are quite polymedicated. Among the drugs used, those with the highest prevalence in prescriptions were: tacrolimus (8.7%), sulfamethoxazole+trimethoprim (8.1%), omeprazole (7.5%), nystatin (7.3%), mycophenolate sodium (5.1%); anlodipine and erythropoetin (5% each); sodium bicarbonate, isoniazid, and pyridoxine (4% each); sirolimus (3.6%); carvedilol and hydralazine (2.8% each); acetylsalicylic acid (2.2%); NPH insulin (2%); clonidine (1.9%); furosemide (1.4%); regular insulin, atorvastatin, and simvastatin (1.2% each); vitamins, special control drugs, antibiotics, drugs for benign prostatic hyperplasia, hormonal drugs, among others, were also some of the items prescribed at discharge.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

The high prevalence of prophylaxis, such as sulfamethoxazole+trimethoprim, nystatin, and isoniazid, is justified by the length of treatment that patients must take, ranging from 1-3 months (nystatin), 6 months (sulfamethoxazole+trimethoprim), and 9 months (isoniazid), and is present in the majority of prescriptions. In a study carried out in the municipality of Dourados (MS), with the aim of finding out about medication practices and representations about the use of medication by kidney transplant patients, 51.7% of those interviewed used antihypertensive drugs, as well as diuretics, antibiotics, vitamins, and antacids (1), which shows a pharmacotherapy profile very close to that of the patients in this study. It can therefore be concluded that the pharmacist's role in monitoring newly transplanted patients throughout the hospitalization period (from admission to discharge), as well as their recommendations, are fundamental to promoting a significant improvement in the outcomes of this transition of care, given the large number of drugs that patients leave using, contributing to a reduction in adverse events and an increase in adherence to pharmacotherapy.

Keywords

Transplantation; Clinical Pharmacy; Polypharmacy

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Antimicrobial Therapy Management: the Role of the Clinical Pharmacist Specializing in Transplants in the Rational Use of Antimicrobials

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About this scientific work

DOI: 10.62922/4cbffc.cp065
Link: https://doi.org/10.62922/4cbffc.cp065
Type: Scientific Work.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/07/2024; Accepted: 02/10/2024; Published: 03/10/2024.

Introduction

Transplant patients need to use immunosuppressants to prevent and treat graft rejection. Due to their permanent state of immunosuppression, they are more susceptible to developing infectious complications in the post-transplant period (1). The occurrence of infections with microorganisms that are multi-resistant to the most varied antimicrobial regimens is common in patients receiving solid organs, making the management of this class even more relevant (2). The use of antimicrobials in

transplantation is essential to balance the scales between rejection and infection, and it is necessary for professionals to be qualified in the management of infectious complications and the rational use of antimicrobials (3). The clinical pharmacist in transplantation plays an important role in applying the rational use of antimicrobials through recommendations on indication, dose, and appropriate administration, contributing to patient safety and the effectiveness of pharmacotherapy.

Aim

To evaluate the pharmaceutical recommendations regarding the use of antimicrobials for patients admitted to the transplant ward.

Methods

This is a retrospective, cross-sectional study of the pharmaceutical recommendations recorded in a database of the Clinical Pharmacy Unit during the period from January 2023 to December 2023 by the pharmacists working in transplant patient care in the transplant ward of a highly complex university hospital. The unit has 22 inpatient beds, serving kidney and liver transplant patients, so the information was compiled by the group to which the recommendations were directed. The project was approved by the Ethics and Research Committee of the Hospital Walter Cantídio University Hospital linked to the Federal University of Ceará (HUWC/UFC) under opinion 5.409.579 and Certificate of Submission for Ethical (CAAE) nº 56178022.9.0000.5045.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

A total of 255 pharmaceutical recommendations were made regarding the use of antimicrobials, 169 in liver transplantation (66.27%) and 86 in kidney transplantation (33.73%). The most prevalent recommendations were dose adjustments (n = 77; 30.20%), followed by infusion time adjustments (n = 70; 27.45%), and antimicrobial dilution (n = 39; 15.29%). Recommendations were also found regarding the best regimen to use (n = 15; 5.88%) and serum vancomycin monitoring (n = 13; 5.10%). Recommendations aimed at finalizing treatment time (n = 14; 5.49%), scheduling (n = 8; 3.14%), defining the complete therapeutic regimen (n = 8; 3.14%), reporting adverse reactions (n = 6; 2.35%), requesting a culture (n = 2; 0.78%), prescribing pre-medication (n = 2; 0.78%), and scheduling (n = 1; 0.39%) were also recorded by the team.

Discussion

The recommendations found contribute directly to the rational use of antimicrobials, since the doses prescribed need to be individualized based on the patient's circumstances and follow well-established clinical protocols. In kidney transplant patients, it is common to need to adjust the dose according to renal function, avoiding the nephrotoxicity induced by some of these agents (3). Not knowing the

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

characteristics of dilution and infusion time can lead to adverse reactions and irreversible damage to the patient, thus highlighting the importance of the clinical pharmacist's role in guiding the use of antimicrobials. Pharmacotherapy care for transplant patients is inherently linked to the use of antimicrobials. The pharmacist's role in providing guidance on the use of antimicrobials is essential to guaranteeing improved clinical outcomes in terms of safety and therapeutic efficacy, thus applying the concepts of rational use of medicines.

Keywords

Transplant; Antimicrobials; Clinical pharmacist.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Comparative Evaluation of Detection and Classification of Drug-Drug Interactions Between Two Databases

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About this scientific work

DOI: 10.62922/4cbffc.cp066
Link: https://doi.org/10.62922/4cbffc.cp066
Type: Scientific Work.
Area: Evidence-Based Health.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Drug interactions (DI) are crucial in clinical practice, affecting treatment safety and efficacy. Identifying and managing these interactions is essential to prevent adverse effects and improve therapeutic outcomes. Drug interaction tracking programs play a vital role in this process. However, the variety of databases available and discrepancies in information and recommendations can pose challenges for healthcare professionals, influencing treatment decisions (1).

Aim

To compare drug interaction information from the scientific evidence databases Uptodate® and Micromedex®.

Methods

This cross-sectional study analyzed data on drug consumption in the Intensive Care Unit (ICU) of a university hospital in Manaus from January to June 2024. The study focused on the 20 most consumed drugs to evaluate the comprehensiveness of the UpToDate® and Micromedex scientific databases in detecting and classifying drug interactions based on severity and documentation (bibliographic references).

Results

The 20 most consumed drugs in the ICU were norepinephrine (16.1%), fentanyl (15.8%), dipyrone (12.6%), ondansetron (10.9%), propofol (10.1%), metoclopramide (6.3%), quetiapine (5.3%), methadone (3.6%), tramadol (2.6%), meropenem (2.6%), omeprazole (2.4%), furosemide (2.1%), enoxaparin sodium (1.8%), dexmedetomidine (1.7%), morphine (1.3%), piperacillin+tazobactam (1.2%), hydralazine (1.2%), sodium heparin (0.9%), nimodipine (0.8%), and midazolam (0.7%). Seventy drug interactions were identified in UpToDate®, with 31.4% classified as high severity, 62.9% as moderate, and 5.7% as low severity. Micromedex® found 45 interactions, with 93.3% classified as high severity, 4.4% as moderate, and 2.2% as low. Micromedex had predominantly weak classification (97.8%), while UpToDate had predominantly reasonable (65.7%) and good (30.0%) classifications.

Discussion

The comparison between UpToDate® and Micromedex® databases showed significant differences in drug interactions. Micromedex® listed more interactions for opioids like tramadol, fentanyl, morphine, and methadone, while UpToDate® had more interactions for quetiapine, propofol, and furosemide. Dipyrone was only found in UpToDate®. Variations were observed in severity and documentation, such as the dexmedetomidine x ondansetron interaction, classified as lower severity in UpToDate® with “reasonable” documentation and higher severity in Micromedex®, with “weak” evidence level. This may be due to the unclear risk of combining these agents, but both databases recommend monitoring concomitant use due to QT interval prolongation in high-risk patients for cardiac arrhythmias. In one instance, the interaction between furosemide and hydralazine was considered moderate in UpToDate® (“reasonable” documentation) and minor in Micromedex® (“weak” documentation). This interaction is due to the combined hypotensive effects of the drugs, suggesting blood pressure monitoring and potential dose adjustments. UpToDate® had 3 excellent, 21 good, and 46 reasonable evidence documents, while Micromedex® had 44 weak and 1 good document. A study of 50 drug pairs found differences in documentation classification between the databases, with Micromedex® often categorizing interactions as severe compared to other sources that labeled them as moderate. This variation may stem from the diverse evidence sources used for classification (1). Thus, it is highlighted

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

that excessive classification of information can cause alert fatigue and hide more important drug interactions, especially when a system reports numerous interactions considered “major” (high risk), with limited evidence (2). Despite this, two crucial combinations, quetiapine x methadone and quetiapine x metoclopramide, were correctly identified as high-risk interactions in both UpToDate® and Micromedex® databases, advising against their combination. The study found notable differences in detecting and classifying drug interactions between the UpToDate® and Micromedex® databases. Healthcare professionals should take note of these variations as they can impact clinical decisions directly (3).

Keywords

Drug Interactions; Electronic Databases; Severity.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Influence of Early Cannabis Use on the Development of Schizophrenia and Psychoses: a Literature Review

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About this scientific work

DOI: 10.62922/4cbffc.cp067
Link: https://doi.org/10.62922/4cbffc.cp067
Type: Scientific Work.
Area: Evidence-Based Health.
Received: 02/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

According to the World Health Organization (WHO, 1993), a drug is any natural or synthetic substance that, when introduced into a living organism, alters one or more of its functions, regardless of whether it is legal or illegal. The WHO acknowledges that the harmful use and dependence on legal or illegal drugs represent a global public health problem that affects cultural, socioeconomic, and political values. Cannabis is a herb with the scientific name Cannabis, and there are three species (Dias et al., 2021). Cannabis sativa contains about 400 chemical substances, including at least 60 alkaloids known as cannabinoids. The primary psychoactive component of the plant is tetrahydrocannabinol (THC), but it also contains other cannabinoids such as cannabidiol (CBD), cannabinol (CBN), and tetrahydrocannabivarin (THCV). Currently, it is posited that the relationship between cannabis use and

the development of psychosis is multifactorial, encompassing both genetic and environmental factors. According to this theory, a polymorphism in the Catechol-O-methyltransferase (COMT) gene may be related to susceptibility to schizophrenia. Additionally, individuals with a family history of schizophrenia appear to be more prone to the psychomimetic effects of cannabis, and schizotypic signs and symptoms seem to be 15 times more common in unaffected children of schizophrenic parents due to recent drug use (Zonaro et al., 2023). Schizophrenia is a disorder that affects neurodevelopment, where the endocannabinoid system also plays a role in modulating this brain process and the increased propensity for psychotic events in cannabis users. The aim of this literature review is to elucidate, through pathophysiological, clinical factors, and the evolution of the disease according to current research, the association between schizophrenia and early cannabis use.

Aim

Analyze the influence of early cannabis use on the development of schizophrenia and psychoses, considering its therapeutic and recreational applications.

Methods

The study is a literature review, which consists of a broad approach and does not follow a strict protocol, as the data source is not predetermined and sometimes less comprehensive. This method is used to understand the studies produced on the same subject. For this purpose, a search of scientific productions was conducted to group and synthesize the results of these studies. Therefore, it is characterized as an important source of research and studies, as it cross-references information from different productions conducted by various academics in different locations under different conceptions of the same theme. The guiding question was developed using the PVO strategy, which identifies as fundamental mnemonics: P - Population or Research Problem; V - Variables; O - Outcome. Thus, the elements were established as: P = Psychoses associated with Cannabis use; V = Association between Schizophrenia and psychoses with early Cannabis use; O = Identify the influence of early Cannabis use on the development of psychoses and schizophrenia. Therefore, the following research question was developed: “What is the influence of early Cannabis use on the development of psychoses and schizophrenia?”. The search was conducted in June 2023, covering the period from 2015 to 2023 due to the availability and currency of research within this period. Data were collected through a bibliographic survey published in the main databases: PUBMED; Virtual Health Library (VHL); SCIELO (Scientific Electronic Library Online); Google Scholar; MEDLINE, and LILACS (Latin American and Caribbean Health Sciences Literature). The following Health Sciences Descriptors (DeCs) were used: Schizophrenia; Psychotic Disorders; Cannabis, associated with the boolean operator AND. For this type of study, there is no need for review and approval by a Research Ethics Committee (CEP), as confirmed by CNS-MS Resolution No. 466 of December 12, 2012.

Results

A total of 3,499 articles were found referring to the effects of cannabis and the induction of psychotic disorders. These included 1 article indexed in SCIELO, 1 article in LILACS, 3,350 results in Google

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Scholar, and 147 in the Virtual Health Library (BVS). From the compilation of descriptors, the first stage of the research resulted in 3,499 articles related to the theme. The next stage, which involved applying advanced search filters and inclusion criteria, resulted in 3,497 articles. In the third stage of the search, the articles were initially evaluated by title and then by abstract, excluding those that did not meet the guiding question of the study. At this stage, 42 articles remained in the literature review. The final stage aimed to eliminate duplicates and studies conducted outside Brazil, resulting in 22 articles being excluded. Thus, the review consisted of 10 articles.The initial search found 3,499 articles on the effects of cannabis and psychotic disorders, with most results coming from Google Scholar. After applying filters and inclusion criteria, 3,497 articles remained, which were then evaluated based on their titles and abstracts, reducing the number to 40. In the final stage, duplicates and studies conducted outside Brazil were excluded, resulting in 10 articles. These articles consistently demonstrated a causal relationship between early cannabis use and the development of psychotic disorders, especially schizophrenia, highlighting the biochemical and neuropathological aspects of this relationship.

Discussion

Schizophrenia, as defined by the DSM-V (2022), is a mental disorder characterized by two or more of the following symptoms for at least one month (or less if treated): delusions, hallucinations, disorganized speech, highly disorganized or catatonic behavior, and/or negative symptoms. At least one of the symptoms must be delusions, hallucinations, or disorganized speech. The diagnosis requires symptoms to persist for at least six months, with one month of active symptoms, causing significant impairment in essential areas of life, such as work and relationships. The onset can be abrupt or insidious, often beginning with cognitive and social deficits, followed by prodromal symptoms like loss of energy, depressed mood, and social withdrawal. The pathophysiology of schizophrenia is explained by several hypotheses. The dopamine hypothesis suggests dopaminergic hyperactivity in the striatum and hypofunction in extra-striatal pathways. The glutamate hypothesis points to hypofunction of NMDA receptors. The interneural dysfunction hypothesis observes reduced activity of GABAergic interneurons in the dorsolateral prefrontal cortex, affecting the inhibition of pyramidal neurons. Additionally, morphological abnormalities such as reduced hippocampal volume and increased ventricles have also been observed. Cannabis, an illicit substance consumed by about 160 million people annually, has delta-9-tetrahydrocannabinol (THC) as its main psychoactive compound. THC interacts with cannabinoid receptors CB1 and CB2, affecting the central nervous system by inducing euphoria, reducing anxiety, and impairing attention and short-term memory. Cannabis use is associated with the development of transient psychotic symptoms such as paranoid ideas and hallucinations. Studies show that early cannabis use increases the risk of schizophrenia, acting as an independent risk factor. The relationship between cannabis and schizophrenia is complex and may involve both a precipitating effect and a genetic predisposition to schizophrenia. The self-medication hypothesis, which suggests that cannabis is used to alleviate schizophrenic symptoms, has less support, with evidence indicating that cannabis use often precedes the development of schizophrenia. Cannabis use can exacerbate schizophrenia in predisposed individuals, and the frequency of use is associated with a higher risk of psychosis. Early use is linked to an earlier onset of schizophrenia, with daily use of high-potency cannabis potentially advancing symptoms by up to six years. The interaction between cannabis and

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

schizophrenia may involve dopaminergic dysfunction and alterations in neurotransmission, affecting dopamine, glutamate, and GABA, and is associated with brain volume loss and reduced blood flow in the hippocampus. Genetic factors, such as polymorphisms in the COMT gene, may interact with cannabis use, increasing the likelihood of schizophrenic symptoms in adulthood.

Keywords

Cannabis; Psychoses; Schizophrenia.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Use of Bisphosphonates By Subcutaneous Infusion in Palliative Care

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About this scientific work

DOI: 10.62922/4cbffc.cp068
Link: https://doi.org/10.62922/4cbffc.cp068
Type: Scientific Work.
Area: Evidence-Based Health.
Received: 30/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The main group of drugs used for bone resorption disorders are the bisphosphonates. This class of drugs specifically targets bones undergoing resorptive changes, without causing systemic effects related to the dose (1). Cancer is associated with distressing complications such as bone pain, hypercalcemia and fractures in patients under palliative care, increasing the risk of hospital admissions. For hypercalcemia and bone pain, bisphosphonates administration is recognized as a first-line treatment. They can be administered orally, but in some cases like malignant hypercalcemia or dysphagia the intravenous route is required (2,3). The oral route is considered the gold standard in palliative care. However, due to functional and cognitive decline, mechanical obstruction of the aerodigestive tract from tumors and swallowing difficulties, this route may not be well tolerated. Therefore, in several conditions, the subcutaneous (SC) route has been pointed as the ideal route (4).

Aim

To describe the efficacy, tolerability, adverse effects and pharmaceutical recommendations of bisphosphonates by the SC route in patients under palliative care.

Methods

Integrative review of Medline databases (via Pubmed); Embase; Cochrane Database; Latin American Literature in Health Sciences (LILACS) and Scientific Electronic Library Online (SciELO), including publications in any language and any year. The electronic search was performed through a combination of Descriptors in Health Sciences (DeCS): ''bisphosphonates subcutaneous infusion palliative care''; ''pamidronate subcutaneous infusion'' and ''zoledronic acid subcutaneous infusion''; "clodronate subcutaneous infusion''. Studies that addressed pharmacological and clinical information of SC bisphosphonates in patients under palliative care were selected.

Results

After applying the inclusion and exclusion criteria, 4 articles were included: 1 prospective study, 2 retrospective studies and 1 case report. The bisphosphonates included in the studies were Clodronate, Pamidronate and Zoledronic Acid. The 4 clinical studies, totaling 209 patients, showed that bisphosphonates administered via SC infusion were effective in the management of bone resorption disorders and well tolerated under palliative care patients. Serum calcium samples were collected before and after the infusion, with all patients achieving normal calcium levels and none presented hypocalcemia (2,3,5,6). Ideally the bisphosphonates should be diluted in saline and the volume varies according to the medicine. The best site for SC administration of bisphosphonates is in the abdomen and other potential sites include the tight or the chest (2,3,5,6). Pamidronate should be administered by SC continuous infusion in the concentration of 180 mg/L in saline (2). Clodronate should be diluted in saline or dextrose 5% in a concentration of 1.5 or 3 g/L and the times for SC infusion can vary from 2 to 24 hours(5,6). Zoledronic acid SC infusion times can vary from 6 to 12 hours and should be diluted in 250 mL to 500 mL of saline solution (3). The main signs of toxicity were directly related to clodronate, including local pain, swelling and redness (5,6).

Discussion

The symptoms of bone pain, lack of appetite, confusion, abdominal pain and nausea were reduced when bisphosphonates was administered by SC infusion (2,3,5,6). Bisphosphonates are diluted in a large amount of saline solution. The SC administration of these drugs should preferably occur in the abdomen due to the greater volume infusion capacity (1500 mL/24 hours) and tolerability (2,3,5,6). Zoledronic acid is eliminated by the kidneys and dose adjustments must be made in patients with renal dysfunction (<4mg/day)(3). Despite local pain being the most frequent signal of toxicity correlated to clodronate, it is suggested that it is not a drug-related effect, as a rapid SC infusion with increased concentration of clodronate solution was not associated with an increase of site toxicity (6). Patients should be monitored for infusion site reactions. to reduce local irritation, it is recommended to decrease the infusion rate, change the SC site location, and apply local heat (2,3,5,6). This alternative route for the administration of bisphosphonates can be very helpful in the management of hypercalcemia and bone pain in palliative care patients. The SC administration can be easily accomplished in the domiciliary setting, sparing the discomfort and costs associated with transportation and hospital intravenous administration (2,3,5,6).

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Palliative; Hypercalcemia; Calcium; Pain; Hypodermoclysis.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Impact of Variants in the Drd2 Gene on the Response to Treatment for Bipolar Affective Disorder

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About this scientific work

DOI: 10.62922/4cbffc.cp069
Link: https://doi.org/10.62922/4cbffc.cp069
Type: Scientific Work.
Area: Evidence-Based Health.
Received: 24/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Bipolar affective disorder (BAD) is a mood disorder associated with severe outcomes when there is non-adherence or lack of response to pharmacotherapy, such as a high risk of suicide, violence, and substance abuse (1). There are two types of BAD: type I and type II. In type I, there is an alternation between manic and depressive phases, whereas in type II, there is an alternation between hypomanic and depressive phases. Pharmacological treatment includes the use of mood stabilizers and antipsychotics for manic episodes, while for depressive episodes, mood stabilizers can be used,

possibly in combination with fluoxetine if necessary (2). The first choice in managing BAD is lithium carbonate, a mood stabilizer that maintains the disease and prevents new episodes (2). However, it is estimated that only 30% of patients respond well to lithium. Additionally, lithium is often combined with antipsychotics, whose use can also be associated with treatment failure (3,4). In this context, pharmacogenetics and genomics aim to understand individual differences in response to pharmacotherapy, as genetics, along with physiological and environmental factors, seems to play a crucial role in treatment outcomes (5). There are reports in the literature indicating that the presence of genetic variants can impact the response to mood stabilizers and antipsychotics (3,4,6). Among the relevant genes, DRD2, which encodes the D2 receptor and is responsible for dopamine synthesis and release, stands out (7). The dopaminergic system regulates emotions and behaviors, and increased activity is associated with manic episodes (8). Antidopaminergic medications, such as lithium and haloperidol, can be used to manage these episodes by acting on the dopaminergic system and reducing its activity (9). Therefore, we hypothesize that genetic variations in the DRD2 gene may alter the functioning of the D2 receptor and, consequently, affect the response to treatment used in BAD (7).

Aim

To evaluate the influence of variants located in the DRD2 gene on the response to pharmacotherapy for BAD.

Methods

A literature review was conducted in the PubMed, Scopus, PsycINFO, SciELO, and Lilacs databases (May 2024) guided by the research question, "What is the influence of variants located in the DRD2 gene on the pharmacotherapy response in BAD?" Primary studies evaluating the influence of DRD2 gene variants on BAD treatment response were included. Studies not conducted with humans (in vivo and in vitro), literature reviews, conference abstracts, editorials, news articles, comments, theses, and dissertations were excluded. Additionally, studies written in non-Roman alphabet languages (e.g., Arabic, Chinese, and Japanese) were excluded. The selection of studies was performed in duplicate and involved screening the titles and abstracts of the retrieved articles. Those meeting the inclusion criteria were read in full (eligibility stage). The study selection was conducted using Rayyan (https://www.rayyan.ai). Extracted variables included country, year of publication, study design, inclusion and exclusion criteria, analyzed genetic variants, evaluated outcomes, sample size, participant characteristics, pharmacotherapy used, frequency of genetic variants, and results.

Results

Two studies have been identified that evaluate the influence of variants in the DRD2 gene on the response to pharmacotherapy for BAD. These studies, published in 2011 and 2023, were conducted in Italy and Switzerland, involving a total of 216 participants. The case-control study conducted by Mandelli et al. (2011) included 131 participants diagnosed with BAD (64 with type I and 67 with type II) and 65 healthy participants (control group). This study assessed the frequency of the genetic variants -141C ins/del and rs1800497 in the DRD2 gene and their impact on pharmacotherapy response. Participants

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

with BAD were treated with mood stabilizers, antidepressants, and antipsychotics, and their treatment response was evaluated based on the severity of depressive symptoms after six months of treatment. The authors did not find any difference in the genotypic frequency of the evaluated genetic variants between the BAD and healthy control groups ($p > 0.05$). Additionally, no association was identified between the presence of the genetic variants and the treatment response for BAD. In the cohort study conducted by Pieri et al. (2023), 20 participants were evaluated, of which 11 were diagnosed with schizophrenia and nine with BAD. This study examined the allelic frequency of the rs1800497 (-2137G>A) and rs6277 (-957C>T) variants and their influence on the response to treatment with cariprazine, an atypical antipsychotic and partial agonist of D2 receptors. Among the 20 participants evaluated, four were considered non-responders. None of the participants with BAD were considered non-responders. The variant allele frequency of both variants was higher among non-responders compared to those who responded to cariprazine. It was not possible to identify the genotypic frequency of the evaluated variants specifically in participants with BAD, as the authors reported frequencies for all participants combined without differentiating between those with BAD and those with schizophrenia.

Discussion

Two studies evaluated the impact of four variants in the DRD2 gene on the response to treatment for BAD. However, none of these variants influenced the participants' response to pharmacotherapy (10, 11). Although the study by Pieri et al. (2023) included participants with BAD, only those with schizophrenia showed no response to treatment, with their response being affected by the variants rs1800497 and rs6277. This suggests that variations in the DRD2 receptor may influence the pharmacodynamics of cariprazine in these participants (11). It is important to note that this study included only 20 participants, and the allele frequencies of the assessed variants were not presented separately according to diagnosis (BAD or schizophrenia). Nevertheless, the variant allele was found to be more frequent among non-responders with schizophrenia. While the genetic variants assessed were not associated with impaired response to BAD pharmacotherapy, literature reports other potential variants that may play a significant role in treatment response. For example, the rs6265 variant (BDNF gene) is associated with a predisposition to BAD and, consequently, a poorer response to lithium (12). However, no pharmacogenetic test specifically for mood stabilizers has been approved by the Food and Drug Administration (FDA) or the European Medicines Agency (EMA) to date (13). In this context, it is essential to highlight that pharmacotherapy response is multifactorial and involves cultural, biological, environmental, and drug-related factors (14). Therefore, a holistic approach that integrates genetic variant analysis with other patient characteristics is essential. Consequently, pharmacogenetics can be considered a promising tool in healthcare, provided it is used in conjunction with other relevant information and guided by available evidence for a comprehensive patient approach.

Acknowledgements: Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) [funding number 2024/02603-9], Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) [funding number 301947/2022-8] and Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Código de Financiamento 001 and 88887.974378/2024-00.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Mental Health; Mood Disorders; Pharmacogenetics.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Effects of Liraglutide on Genomic Instability in Swiss Mice That Received a Hyperlipidic Diet

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About this scientific work

DOI: 10.62922/4cbffc.cp070
Link: https://doi.org/10.62922/4cbffc.cp070
Type: Scientific Work.
Area: Evidence-Based Health.
Received: 19/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Obesity is a non-communicable chronic disease characterized by excessive accumulation of body fat, reaching epidemic proportions. It is underdiagnosed, and its mortality is underestimated, when diagnosed late, it can burden healthcare systems (1). Life expectancy for individuals with obesity may be reduced due to associated comorbidities such as cardiovascular diseases and diabetes mellitus, in addition to healthcare quality and lifestyle factors (2). The physiology of obesity is related to a state of chronic inflammation (3) and to energy balance, which is the relationship between calorie intake from

food and calorie expenditure through physical activity, physiological functions, and basal metabolism (4). In recent years, genomic instability as an underlying factor in obesity has been investigated, with connections between obesity and epigenetic modifications (5). Genomic integrity is crucial for maintaining regulated metabolism, appetite control, and energy homeostasis. The high-fat diet (HFD) was chosen to induce obesity in the animal model due to its high palatability, high caloric and fat content. Additionally, this diet can produce Reactive Oxygen Species (ROS), influence gene expression, and lead to metabolic disorders and disease development (6). Liraglutide, a hypoglycemic agent for diabetes, is used off-label as a treatment strategy for obesity. It is an analogue of glucagon-like peptide 1 (GLP-1) that promotes satiety, delays gastric emptying, and improves insulin sensitivity. Liraglutide may have protective properties against DNA damage by reducing ROS and inflammation (7). This study investigated the genotoxic effects of Liraglutide using the Comet Assay to assess DNA damage in Swiss mice fed with HFD.

Aim

The objective of this study was to evaluate genotoxicity through the comet assay in peripheral blood and liver of Swiss mice that received a high-fat diet and Liraglutide treatment.

Methods

Ethical approval was obtained from the Ethics Committee for Animal Use of the University of the Extreme South of Santa Catarina (Unesc), protocol 58/2022. Twenty-four male Swiss mice were divided into four experimental groups with six animals each: G1 (Control – standard diet and subcutaneous saline injection); G2 (HFD – high-fat diet with 60% fat and subcutaneous saline injection); G3 (Liraglutide – standard diet and subcutaneous Liraglutide injection 0.15 mg/kg); G4 (HFD + Liraglutide – high-fat diet and subcutaneous Liraglutide injection 0.15 mg/kg). Mice were fed the HFD for 16 weeks to induce obesity. After this period, designated groups received daily subcutaneous Liraglutide injections for 4 weeks. Liraglutide administration was performed at the end of the experiment to evaluate its therapeutic effect. At the end of 20 weeks, animals were euthanized, blood was collected during euthanasia, and liver was collected for the Comet Assay. Blood and liver cells were isolated and embedded in low-melting-point agarose, deposited on microscope slides, and subjected to lysis. After lysis, slides were incubated in alkaline solution to unwind DNA and subsequently subjected to alkaline electrophoresis to separate DNA fragments. Negative and positive controls were used for each test. Electrophoresis in order to ensure the reliability of the procedure. Slides were stained with Sybr Gold (Invitrogen, EUA). All blades coded for blind analysis. to assess the damage, the slides were viewed under a fluorescence microscope at 200x magnification using the Comet Assay IV program, where 100 cells/animal were evaluated (8). The cells were automatically classified according to the proportions of tail length (consisting of the distance from the middle of the nucleus to the end of the tail in μm) and tail moment (tail length x tail fluorescence intensity), using Tail Intensity (%). Data were expressed as mean ± standard deviation of the mean. He was analyzed the variables regarding normality of distributi

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Results

The high-fat diet resulted in a significant increase in body weight of HFD group mice compared to the control group, with an average body weight of 36.05 ± 2.28 g in the HFD group and 32.23 ± 2.50 g in the control group, although calorie intake was significantly higher in the control group (182.0 ± 10.77 kcal/day in the control group and 207.2 ± 13.68 kcal/day in the HFD group). In the Comet Assay of peripheral blood, an increase in DNA damage was observed in the HFD group, Liraglutide group, and the group consuming the high-fat diet concurrently with Liraglutide, compared to the control group. Regarding the liver, there was a statistically significant increase in DNA damage in the high-fat diet group compared to the control group. However, there was no statistically significant difference in the Liraglutide group and the group receiving the high-fat diet concurrently with Liraglutide compared to the control group.

Discussion

The results of this study indicate that the high-fat diet (HFD) caused significant genotoxic damage in the peripheral blood of mice, as evidenced by the increased Tail Intensity in the Comet Assay. HFD is known to induce oxidative stress and inflammation, mechanisms that can result in DNA breaks and genomic instability (9). This study observed an increase in such damages, consistent with previous research linking high-fat diets, especially saturated fats, to genotoxic processes (10). The administration of Liraglutide did not demonstrate significant efficacy in mitigating genotoxic damages induced by HFD. This finding suggests that the mechanisms by which Liraglutide acts to control weight may not be directly related to protecting against DNA damage (11). In summary, the results of this study indicate that the high-fat diet (HFD) and the use of Liraglutide may impact genomic integrity, revealing a complex interaction between dietary patterns, health, and DNA damage. Given the complexity of the results, it is essential to conduct studies additional information, especially to explore different doses of Liraglutide in order to get a more complete picture of potential health risks.

Keywords

Liraglutide; Genotoxicidade; Obesidade; DNA.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Incidence of Adverse Effects Associated with Diazepam and the Role of Pharmacovigilance

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About this scientific work

DOI: 10.62922/4cbffc.cp071
Link: https://doi.org/10.62922/4cbffc.cp071
Type: Scientific Work.
Area: Evidence-Based Health.
Received: 06/06/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Diazepam is a drug in the benzodiazepine class and is widely used to treat conditions such as anxiety, muscle spasms and epileptic seizures. However, its use can lead to a variety of adverse effects, which can range from mild to severe.(1) the usual adverse effects are drowsiness, fatigue and dizziness, although there are more serious reactions such as dependence, respiratory depression and mental alterations.(2) the occurrence and intensity of these negative reactions are influenced by factors such as dosage, duration of treatment and individual patient characteristics. In this context, pharmacovigilance plays a fundamental role in monitoring and managing the risks related to the use of Diazepam.(3) This process consists of systematically collecting, analyzing and interpreting information on the side effects of medicines, with the aim of identifying new risks, evaluating changes in the frequency of known adverse events and ensuring patient safety.(1,2)

Aim

Examine the factors that may influence the occurrence of these adverse events, including demographic characteristics and the active role of pharmacovigilance.

Methods

This is a cross-sectional, observational and retrospective study, where data was extracted from the Health Surveillance Center database, guaranteeing the anonymity of patient information in the data analysis, where adverse effects reported to the Health Service were identified. The reports of adverse effects associated with Diazepam were evaluated and complete data on patient demographics were obtained from the Vigimed and Periweb databases for the months of January 2024 to May 2024.

Results

During the period, 30 patients from various hospital institutions in the state of São Paulo were evaluated, including men and women aged between 20 and 80, where we obtained 15 hospitalizations and 2 deaths. Analysis of the data collection revealed that the majority of patients affected were women under 50 years of age, with 15 patients. This demographic group accounted for a significant proportion of the reports of sleepiness (13 cases). Patients also reported suicidal ideation, anaphylaxis, dyspnea, hypertension, cabergoline intoxication and ineffectiveness, suggesting a greater sensitivity or prevalence of diazepam use in younger women, which suggests that, although rare, it can happen. These cases highlight the importance of close monitoring. All 15 hospitalized patients indicate the seriousness of diazepam's adverse effects, with significant implications for public health. The two deaths recorded highlighted the need for close monitoring and early intervention to mitigate the risks associated with the use of these drugs.

Discussion

The data highlighted the crucial importance of pharmacovigilance in identifying adverse effects. The ability to detect patterns and rarities in adverse effects allows hospitals to implement preventive strategies, including continuing education to improve patient safety.

Keywords

Pharmacovigilance; Diazepam; Adverse Effects.

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ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Incidence of Adverse Effects of Enoxaparin Sodium and the Role of Health Surveillance: a Comprehensive Analysis

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About this scientific work

DOI: 10.62922/4cbffc.cp072
Link: https://doi.org/10.62922/4cbffc.cp072
Type: Scientific Work.
Area: Evidence-Based Health.
Received: 05/06/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Enoxaparin sodium is a low molecular weight anticoagulant used worldwide in clinical practice, widely recognized for its efficacy in the prevention and treatment of thromboembolic disorders. However, like all drugs, its administration is not without potential adverse effects, which demand careful attention from health professionals and regulatory authorities. Clinical studies show that bleeding is the most common adverse effect associated with the use of enoxaparin.1 Although it is often mild, in some situations it can develop into clinically important. Health surveillance plays a fundamental role in monitoring and evaluating the safety of medicines. By receiving reports and analyzing the data, regulatory authorities can identify early signs of potential new and previously undocumented adverse effects, making it possible to implement appropriate corrective measures to protect public health.2 Professional package leaflets for enoxaparin sodium provide detailed information on the possible adverse effects associated with its use, as well as recommendations for monitoring and managing these events. It is essential that healthcare professionals are familiar with sources of information other than package leaflets and use them as a guide to the safe and effective use of the drug. This review aims to provide a comprehensive overview of the challenges and considerations related to the safe use of

enoxaparin sodium, highlighting the ongoing need for monitoring and evaluation to ensure safe and effective clinical practice.3

Aim

To analyze the factors that can contribute to the occurrence of adverse drug reactions and the role of pharmacovigilance.

Methods

This is a cross-sectional, observational and retrospective study with data extracted from the database of the São Paulo State Health Surveillance Center (CVS), guaranteeing anonymity for statistical data, with the help of VigiMed (VigiFlow), PeriWeb and MicroMedex for data extraction and verification.

Results

Results and the total number of notifications of primary adverse reactions to enoxaparin from January 2020 to December 2023 was 214, of which 148 were female (F) and 66 male (M). Among these, there were a total of 32 hospitalizations (6M, 27F) and 15 deaths (7M, 8F), with women predominantly affected by adverse events. It is possible to observe a very small number of notifications from hospitals (37 institutions), which are essential for providing data in clinical practice. On the other hand, only 2 of the 15 deaths reported were notified by hospitals, one of them due to COVID-19, which was not directly related to the use of Enoxaparin, and the other due to a stroke, but no more detailed data was provided for evaluation. The precariousness of reporting in hospital practices makes the evolution of pharmacovigilance and the development of the adverse events database very difficult, which could greatly contribute to the rational use of all medicines.

Discussion

In conclusion, although enoxaparin sodium is a valuable anticoagulant therapy, its use is associated with an incidence of adverse effects, highlighting the importance of health surveillance in identifying new and possibly unknown reactions. In Brazil, obstacles remain in the way of correcting and avoiding adverse events. The underreporting of adverse drug reactions (ADRs), whose main causes are varied, or the incompatibility and lack of practicality between the national and global databases and the ineffective monitoring and enforcement by regulatory agencies seem to reinforce the global challenges.

Keywords

Pharmacovigillance; Enoxaparin; Adverse Effects.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Epidemiological And Phenotypic Study Of Esbl-Producing Urine Isolates From Patients Treated In Londrina-Pr

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About this scientific work

DOI: 10.62922/4cbffc.cp073
Link: https://doi.org/10.62922/4cbffc.cp073
Type: Scientific Work.
Area: Evidence-Based Health.
Received: 31/07/2024; Accepted: 02/10/2024; Published: 03/10/2024.

Introduction

Antimicrobial resistance is a worldwide public health problem. These drugs are widely used to treat infections, both in hospitals and in the community. However, their excessive use has led to the selection of resistant samples. In addition, it is worth mentioning that the epidemic outbreak caused by COVID-19 has also led to the worsening of multidrug resistance (MDR) of uropathogens in the community, as there has been an increase in the incidence of secondary bacterial infections, thus increasing the use of antimicrobials, or even indiscriminate use, corroborating the development of MDR bacterial isolates (1). Currently, bacterial isolates producing extended-spectrum β-lactamases (ESBL) have been a major concern in the community (2). ESBLs inactivate β-lactam antimicrobials by breaking the amide bond of the beta-lactam ring of broad-spectrum penicillins and cephalosporins. ESBLs are prevalent throughout

the Enterobacterales order, but are commonly present in Klebsiella pneumoniae and Escherichia coli. In addition, other bacteria belonging to the Enterobacteriaceae family produce class C β-lactamases, this is, cAMP enzymes active against third-generation cephalosporins, and associated with carbapenem resistance in K. pneumoniae strains (3). Treatment for urinary tract infections (UTIs) involves the use of antimicrobials, the most commonly used of which are: sulfonamides, represented by the association sulfamethoxazole/trimethoprim; nitrofurantoin; fosfomycin; quinolones, such as nalidixic acid, ciprofloxacin and norfoxacin; 1st generation cephalosporins, such as cephalothin and cephalexin; cefuroxime (2nd generation); and the association of amoxacillin/clavulanic acid and aminoglycosides, such as amikacin and gentamicin.

Aim

In this sense, the aim of the study was to determine the prevalence and sensitivity profile of ESBL-producing bacteria isolated from urine from patients in the Londrina-PR community, from October 2021 to July 2022.

Methods

This was a cross-sectional, descriptive study. During the study period, between October 2021 and July 2022, urine cultures were taken from patients at Londrina's Basic Health Units and Emergency Care Units, attended by the Londrina City Hall Central Laboratory (CentroLab). Bacterial isolates that tested positive for ESBL were selected using the Vitek@2 automated system (bioMérieux, Marcyl'Etoile, France). The samples were stored in nutrient agar (room temperature) until the confirmatory tests were carried out. The VITEK® 2 GP ID card was used to identify gram-positive microorganisms. The VITEK® 2 GN ID card and the VITEK® 2 AST408 card for antimicrobial susceptibility testing (bioMérieux, Marcyl'Etoile, France) were used to identify gram-negative microorganisms. The antimicrobials evaluated were: ampicillin, cephalothin, ceftriaxone, cefepime, meropenem, ertapenem, amoxicillin/clavulanic acid, piperacillin/tazobactam, amikacin, gentamicin, ciprofloxacin, norfloxacin, nalidixic acid, nitrofurantoin and sulfamethozaxole/trimethoprim. Interpretation was carried out according to the Br Cast 2022 criteria. In addition, demographic data was collected on all patients, including age and gender, through the WebSaúde system of the Londrina city hall public health network. Study was submitted to and approved by the Ethics Committee (CAAE 56869816.0.0000.5231).

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

In the period studied, 689 ESBL-positive samples were identified from urinary isolates from patients treated at UBS and UPA in Londrina. The socio-demographic data analyzed showed that 78.7% were women and 21.3% men. The age range of the patients whose ESBL isolates were identified was assessed and 55.1% were over 60 years old, followed by adults aged 30 to 59 (33.7%) and young people aged 15 to 29 (11.2%). Among the isolates, 80.3% were E. coli, 12.3% K.pneumoniae and 7.4% were other ESBL-

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

producing microorganisms. The higher prevalence of E. coli and K. pneumoniae is to be expected according to the literature. The analysis of the sensitivity profile of E. coli showed that there was a higher percentage of sensitivity to meropenem (97.6%), ertapenem (97%), amikacin (97.3%), nitrofurontoin (92%), pipericillin/tazobactar (86%), gentamicin (83.4%), amoxicillin/clavulanic acid (67.2%). clavulanic acid (67.2%), and cefepime (63.8%), followed by trimethropim/sulfamethoxazole (50.5%), ciprofloxacin (44.55%), norfloxacin (43.9%), nalidixic acid (41.9%), ceftriaxone (39.2%), cefuroxime (9.2%) and cefuroxime (5.6%). It is worth noting that ampicillin, cephalothin and cephalexin showed 100% resistance. For K.pneumoniae, the sensitivity profile was lower than for E. coli, with amikacin (90.6%), ertapenem (77.1%) and meropenem (77.9%), with amikacin (90.6%), ertapenem (77.1%) and meropenem (77.9%), followed by gentamicin (48.2%), trimethropim/sulfamethoxazole (25.9%), cefepime (21.2%), nitrofurontoin (20.5%), pipericillin/tazobactam (16.7%), amoxicillin/clavulanic acid (11.4%), ceftriaxone (5.7%), cefuroximeaxetil (4.2%) and cefuroxime (1.2%). It should be noted that K.penumoniae was 100% resistant to ampicillin, cephalothin and cephalexin.

Discussion

The greater susceptibility to UTIs in women is directly linked to the fact that women have a shorter urethra and are closer to the anus (4).The frequency of UTIs increases with age in both sexes. In elderly men, it can be due to prostate disease (very common), residual urine and recurrent catheterization, urethral narrowing or other anatomical abnormalities. In elderly women, menopause and anatomical-functional changes to the bladder are also predisposing factors for UTIs (5). In addition, coexisting diseases such as diabetes, strokes and changes in the immune response also influence the prevalence of UTIs in this age group (6). Antibiotics are one of the pillars of public health and play a key role in improving the health and well-being of people around the world, however, excessive use has led to the selection of antimicrobial resistance. In Brazil, the indiscriminate use of antibiotics has led the National Health Surveillance Agency (ANVISA) to restrict their use through Board Resolution (RDC) No. 20, of April 10, 2014, with mandatory presentation and retention of the prescription and expiration date to prevent sale after the deadline. The high prevalence of ESBL-producing E. coli and K. pneumoniae, as well as similar antimicrobial sensitivity profiles for both microorganisms, were found by Padmini et al. (2017)7. This study showed that during the Covid-19 pandemic, resistance to carbapenems emerged in community microorganisms causing UTIs, especially in K.pneumoniae. Despite the increase in resistance to some classes of antimicrobials, nitrofurantoin is still an excellent therapeutic option for the treatment of E.coli, even though it is an ESBL producer. In addition, this study highlights that studying the sensitivity profile of uropathogens is essential for the pharmacotherapeutic monitoring of patients, especially with regard to the efficacy and safety of therapy.

Keywords

Urinary Tract Infection; Antibiotics; Antimicrobial.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pathological Response to Neoadjuvant Chemotherapy in Women with Hormone Negative Breast Cancer: Comparing Pure HER2 and Triple Negative Subtypes

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About this scientific work

DOI: 10.62922/4cbffc.cp074
Link: https://doi.org/10.62922/4cbffc.cp074
Type: Scientific Work.
Area: Evidence-Based Health.
Received: 05/08/2024; Accepted: 02/10/2024; Published: 03/10/2024.

Introduction

Breast carcinoma (BC) is a heterogeneous disease with diverse clinicopathological conditions, responses to treatment and prognosis: it is classified into molecular subtypes, with different genetic profiles, which in clinical practice are based on immunohistochemically expression of estrogen receptor (ER), progesterone receptor (PR), human epidermal growth factor 2 (HER2) and proliferation marker, the Ki-67 (1). The molecular subtypes that don't express ER+ and PR+ receptors, also called non-luminal BC

are classified in HER2-enriched (HER2+) and triple negative BC (TNBC) (2). TNBC are associated with a poorer prognosis than other BC (3). Before anti-HER2 therapy, studies indicated that patients with HER2+ BC had more aggressive disease, poorer prognosis, and lower overall survival (OS) compared to patients with other BC subtypes (4). However, anti-HER2 drugs have contributed to a better prognosis of the disease (5). In TNBC and HER2+ the neoadjuvant systemic chemotherapy (NACT) is the standard, especially for tumors larger than 2 cm and/or affected axillary lymph nodes. For HER2+ BC, although new targeted therapies and/or immunotherapy are already used in some services, standard neoadjuvant chemotherapy regimens include: Doxorubicin and Cyclophosphamide followed by Paclitaxel and Trastuzumab (6). For TNBC, the regimens consist of: Doxorubicin and Cyclophosphamide followed by Paclitaxel and Carboplatin or Docetaxel and Carboplatin (7,8). One advantage of NACT strategy is that it allows monitoring of the treatment effect using predictive biomarkers of in vivo tumor sensitivity and pathological response. Although they are sensitive to NACT, TNBC have greater early relapse rates and worse prognosis when compared to other subtypes of BC (9). HER2+ carcinomas, in addition to benefiting from NACT, have a significantly higher survival with the use of anti HER-2 therapy (10).

Aim

The aim of this study was to compare the clinical and treatment characteristics of a large cohort of women TNBC and non luminal HER2+ carcinomas and its association with response to neoadjuvant chemotherapy (NACT).

Methods

Women with a histological diagnosis of BC, treated at the Women's Hospital of the State University (CAISM/UNICAMP) of Campinas-SP, from June 2016 to June 2023, were selected for the study. All consecutive women aged 18 or over, with a diagnosis of TNBC or enriched HER2 treated with NACT, who agreed to participate and provided material after signing the informed consent form were included. Data collection was based on electronic medical records. The study was approved by the Research Ethics Committee (CEP) of the Research Pro-Rectory (PRP)/UNICAMP. Seventy six women with HER2-enriched breast carcinoma and 160 with TNBC were included. Clinical and histopathological information was collected, including menopausal status, age, ethnicity, tobacco and alcohol consumption, number of births, body mass index (BMI) indicating obesity (greater than or equal to 30). FIGO tumor stage (T), nodal stage (N), presence of metastases, histological type and percentage of Ki67 proliferative marker expression (prognostic factor for BC). The neoadjuvant chemotherapy (NACT) regimen included: Doxorubicin and Cyclophosphamide (AC), followed by Paclitaxel and Trastuzumab (Herceptin) for HER2+ BC; or Docetaxel and Carboplatin with Trastuzumab. For triple-negative breast cancer (TNBC), the regimen included AC, followed by Paclitaxel and Carboplatin. As described in a previous study (11), the response to NACT was evaluated on surgical specimens removed after NACT according to the Residual Cancer Burden (RCB) guidelines (12). For statistical analyses, all cases were clustered into two major groups based on the response to NACT: (a) cases with a pCR as sensitive, and (b) cases with residual BC (RCB-I, RCB-II, and RCB-III) as resistant. All data was recorded on a Microsoft Excel and analyzed using the chi-square and Fisher's exact tests. The significance level adopted for the interpretation of the tests

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

was 5% ($p < 0.05$). The study was approved by the Ethics Committee under CAAE number 85013718.1.0000.5404.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

Table 1 compares the critical patient and disease features of the 236 women according to the response to NACT. Thirty-four women (44.7%) with HER2+ carcinomas and 53 (33.1%) with TNBC presented a complete pathological response (pCR) to NACT, with no significant difference in pCR rates between HER2+ and TNBC (p=0.11). Most women in both groups were menopausal, but 42.1% of HER2+ and 46.9% of TNBC women were premenopausal. The majority of women declared to be white, non-smokers, non-drinkers, and had one or more births. Menopause, age, ethnicity, alcohol consumption, and parity were not related to pCR rates. In HER2+ BC, obesity was significantly associated with a lower pCR rate (p=0.0075), though this was not observed in TNBC women. Table 2 compares tumor characteristics according to the response to NACT. No signal differences were observed in nodal stage (N), presence of metastases, or histological type. T stage characteristics did not show significant differences between pCR and RCB subgroups in HER2+ BC (p=0.78) and between pCR subgroups of HER2+ and TNBC (p=0.16). However, TNBC, significant differences were found between pCR and RCB subgroups in T stage (p=0.007), T1 showed significant differences when compared to T2 (p=0.047), T3 (p=0.0132), and T4 (p=0.0017). No significant differences were observed when comparing the women with T2, T3, and T4 stages. Moreover, when analyzing Ki67, 92.4% of TNBC women and 75,8% of HER2+ women had Ki67 ≥ 20% (p=0.0516). No other significant difference was observed. Table 3 compares the chemotherapy regimen oWhen comparing the pCR and RCB subgroups' regimens among women with HER2+ and among women with TN, there were no significant differences. However, when comparing the pCR subgroups between HER2+ and TN, there was no significant difference in the AC regimen; however, the taxol (p=0.044) and carboplatin ($p < 0.00001$) regimens showed significant differences.

Discussion

A meta-analysis shows that pathological response defined as ypT0ypN0 or ypT0/isypN0 is associated with better long-term outcomes and demonstrates strong prognostic value, especially for aggressive breast cancer subtypes (13). A retrospective clinical analysis of 254 patients with breast cancer who underwent NACT through Brazil's Unified Health System (SUS) in 2008 and 2009 found a pCR rate of only 6.69% (14). In contrast, in this study 37.8% of the women achieved a complete pCR. Rolim's study involved administering 60 mg/m^2 of Doxorubicin and 600 mg/m^2 of Cyclophosphamide in monthly cycles, followed by four cycles of Paclitaxel at 175 mg/m^2. In comparison, the regimen at CAISM included AC in 21-day cycles, then Paclitaxel 80 mg/m^2 weekly and Trastuzumab for HER2+BC. For TNBC, the protocol consisted of AC the same doses, followed by Paclitaxel 80 mg/m^2 and Carboplatin AUC 2 weekly. Rolim's cohort included patients with HER2+BC, TNBC and those with luminal phenotypes. The standard-of-care neoadjuvant treatment for TNBC is based on the phase III Keynote-522 study, which indicated that 64.8%

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

of patients in the pembrolizumab–chemotherapy group achieved a pCR compared to 51.2% in the placebo-chemotherapy group (estimated treatment difference of 13.6%, P<0.001) (15). Among patients at CAISM from 2016 to 2023, only 33.1% with TNBC reached a pCR. For HER2+BC, the standard treatment is based on the phase III KATHERINE study regimen (16), which demonstrated that anti-HER2 double therapy combined with taxane resulted in a pCR rate of 46%. In this study, 44.7% of women with HER2+BC achieved a pCR with NACT. Despite not receiving neoadjuvant pertuzumab as recommended, CAISM patients still show high response rates, likely due to their regimen of AC, Paclitaxel, and Trastuzumab. There is a global epidemic of obesity, and according to the American Cancer Society, overweight and obese patients are more likely to develop postmenopausal breast cancer with lower survival rates. The analyses reveal that elevated BMI is associated with an increased risk of developing TNBC in premenopausal women (17). In this analysis, there was not enough statistical power to reveal the same correlation; however, in HER2+BC, obesity correlates with a lower pCR rate (p=0.0075), although this was not seen in TNBC patients. Obesity was strongly linked to a more advanced stage of breast cancer at the time of diagnosis (18). This analysis of tumor size (T) and its correlation with pCR, we observed that the pCR rate had statistical significance related to T staging only for the TNBC. Patients at CAISM/UNICAMP receive high-quality service with a standardized NACT process that demonstrates excellent response rates, using RCB to measure results. However, considering data on pCR from recent studies that incorporate targeted therapy and/or immunotherapy, a significant treatment gap exists, negatively impacting outcomes for patients treated under the SUS.

Keywords

Breast Cancer; Neoadjuvant Chemotherapy; Treatment.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Mobile Apps in Healthcare: Impacts and Effectiveness in Patient Monitoring and Treatment

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About this scientific work

DOI: 10.62922/4cbffc.cp075
Link: https://doi.org/10.62922/4cbffc.cp075
Type: Scientific Work.
Area: Health Informatics.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The use of mobile apps in healthcare has revolutionized how patients are monitored and treated. Since the introduction of next-generation smartphones, there has been significant growth in research and development of apps designed for patient monitoring. These apps offer a platform for continuous monitoring, health education, and efficient communication between patients and healthcare professionals. In pharmacy, in particular, these apps have considerable potential to improve treatment adherence, reduce medication errors, and promote self-care. Studies indicate that mobile apps can provide substantial support for both patients and healthcare professionals. They allow professionals to remotely monitor patient data and receive alerts about critical symptoms, while patients can track their own symptoms over time and receive personalized advice (1). Additionally, mobile apps can be especially useful for polypharmacy patients, helping them manage their prescriptions more effectively and safely, minimizing the risks of adverse drug interactions (2). The ability of apps to provide real-time feedback and continuous support is particularly valuable in the treatment of chronic diseases and the management of complex therapies, such as chemotherapy. Current literature suggests that the use of mobile apps can improve patients' quality of life, increase treatment adherence, and reduce symptom burden (3). However, more research is needed to validate these features and ensure their effectiveness and safety (4).

Aim

This study aims to evaluate the use of mobile apps in patient monitoring, investigating how these apps can improve medication management, promote treatment adherence, and provide continuous educational and clinical support to patients.

Methods

A bibliographic review was conducted on articles published between 2019 and 2024 in Portuguese and English, consulting the Google Scholar, PubMed, and SciELO platforms. The selected descriptors were: Mobile Apps, Telemonitoring, Pharmaceutical Care. A total of 218 articles were identified, of which 195 were excluded after reading the titles and verifying the publication date. Twenty-three were selected for abstract reading, resulting in eight articles approved for full reading.

Results

The analysis of the selected studies revealed a variety of benefits and challenges associated with the use of mobile apps in patient monitoring. The apps addressed areas such as treatment adherence, polypharmacy management, telemonitoring, educational support, patient safety, and communication between patient and healthcare professional. The apps were developed to serve both the multidisciplinary team and the general population. The studies showed that mobile apps are valuable tools for improving patient safety, facilitating effective communication, and reducing medication-related harm. Furthermore, they play a crucial role in education, screening, and enhancing the technical skills of healthcare professionals. The results indicate that apps have the potential to improve patient safety by preventing harm and reducing adverse events. The use of apps can optimize care time, improve diagnostic accuracy, and ensure a complete electronic record, which is crucial for continuity and safety of care (5).

Discussion

Mobile apps have shown effectiveness in telemonitoring chemotherapy patients, providing real-time guidance and improving symptom control, which potentially reduces complications and hospital costs (6). The consolidated analysis of the studies suggests that telemonitoring acute post-chemotherapy toxicity through mobile devices, ensuring timely guidance, results in better symptom control and potentially reduces complications, usage of hospital resources, and costs, enhancing priority outcomes in the oncology population (7). The use of these apps also helped reduce medication discrepancies during admission to healthcare services, improving patient safety (2). Besides serving as educational tools by providing detailed information about diseases, treatments, and self-care, the apps increased patients' knowledge about their health conditions and improved their ability to manage their own care (8). In one study, most oncology patients expressed satisfaction with the use of a symptom management app, highlighting its effectiveness in symptom relief and quality of life improvement (6). Mobile apps have significant potential to transform patient monitoring, especially in the pharmacy field. They offer a robust platform to improve treatment adherence, manage polypharmacy, and provide continuous support to

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

patients. However, more research is needed to validate these features and ensure their effectiveness and safety. With the continuous advancement of technology, it is likely that these apps will become an essential tool in healthcare management, improving patient quality of life and treatment efficiency. The analysis of the studies suggests that the acceptance and use of mobile apps by healthcare professionals still face significant barriers, such as lack of adequate training and resistance to technological change. Furthermore, data protection and patient privacy are concerns that need to be addressed to ensure trust and security in the use of these apps. Future studies should focus on long-term evaluation of these apps in real care settings, as well as cost-benefit analysis of their large-scale implementation. The research presents limitations, such as the fact that many of the mentioned apps did not have their download names cited in the original articles, and others are still in the testing phase, requiring more studies to evaluate the impact on patients' lives after validation of these software.

Keywords

Mobile Applications; Health Informatics; Telemonitoring.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Study on the Use of Medicinal Plants By Residents of Amajarí-RR: an Ethnopharmacological Approach

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About this scientific work

DOI: 10.62922/4cbffc.cp076
Link: https://doi.org/10.62922/4cbffc.cp076
Type: Scientific Work.
Area: Integrative and Complementary Practices.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Nature is the best combinatorial chemistry and possibly holds solutions for all of humanity's diseases. A strong body of evidence suggests that two-thirds of the world's herbal species have therapeutic values (1). Synthetic drugs still have their importance and remain widely used. Brazil has the richest medicinal flora in the world, thus possessing a very rich popular medicine. According to data from the Ministry of Health (MS), between 2013 and 2015, the use of plants for medicinal and phytotherapeutic purposes grew by 161% in the country (2). This appreciation has led various countries to discuss its importance

and Brazil to create policies for access to and use of plant resources linked to the Unified Health System (SUS). There has also been increased encouragement for scientific studies and research, both in searching for ethnobotanical surveys of traditional knowledge and the use of medicinal plants, as well as testing the validity of the collected information (2). The Amazon territory, which includes the municipality of Amajarí in northern Roraima, is rich in medicinal plant nurseries due to its great variety. Some studies emphasize that in the Amazon, the use of medicinal plants is common because the Amazon rainforest contains a range of natural resources that constitute the raw material for popular medicine (3). These plants have been well documented for their medicinal uses for thousands of years, and traditional medicines remain an important part of routine treatments for various diseases in different parts of the world (4). In light of this, the importance of ethnopharmacological studies aimed at investigating the use of medicinal plants is highlighted. Such studies are essential for the scientific validation of the therapeutic potentials of these natural resources, allowing for the discovery of bioactive compounds and valuing ancestral knowledge.

Aim

To conduct an ethnobotanical survey of plants with medicinal potential in the municipality of Amajarí, Roraima.

Methods

The research was conducted in the village of Brasil in the municipality of Roraima, located in the northern part of the state. The municipality has a population of 13,927 inhabitants and a demographic density of 0.49 inhabitants per km^2 (5). This is a field research, exploratory in nature, with a descriptive-exploratory and quantitative approach. The qualitative approach is characterized by investigating and understanding social phenomena in depth, focusing on perception, intuition, and subjectivity, and working with descriptions, interpretations, and comparisons in their full richness, with fidelity in the form of recording or transcription (6). The descriptive-exploratory approach seeks to investigate traditions, knowledge, and practices regarding medicinal plants among residents of a specific context (GIL, 2008). According to the author, the descriptive-exploratory research describes faithfully the understandings and experiences of a particular group or situation, allowing for the identification and analysis of that reality. Data were collected through semi-structured interviews, with questions about the resident's identification, socio-environmental, demographic, ethnobotanical, and ethnopharmacological characteristics. Visits to gardens were accompanied by the interviewee, through a guided tour, during which a dialogue about the composition of medicinal plants in the garden and their schedule was held, followed by notes in a field diary (8). Due to the impossibility of collecting botanical samples, photographic records of the species in the field were made, followed by the indication of the common name (ethnospecies). Botanical identification was done by comparison with other virtual databases. For the analysis of experimental data, information obtained from interviews and the exploratory survey was tabulated in a digital spreadsheet, descriptively analyzed, and organized in Microsoft Excel 2016.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Results

A profile of 15 people was recorded, with 33.4% being male (5 men) and 67.6% being female (10 women). Regarding education, 45.5% have completed higher education, 27.3% have incomplete higher education, and 27.3% have completed secondary education. as for income, 18.9% earn more than five minimum wages, while 36.4% earn up to one minimum wage. Only 9.1% of the respondents do not use medicinal plants, citing a lack of knowledge, while 90.9% use plants with medicinal potential. The most commonly used plants for treating diseases include Curatella americana (Caimbé) for wounds, Arrabidaea chica Verlot (Crajiru) for uterine inflammations and anemia, and Salvia procurrens Benth (Campo Sage) for colds and flu, each used by 66.67% of the respondents. Mentha spicata (Spearmint) is popular for its digestive and refreshing properties, used by 73.33% of the respondents. Other plants have more limited use: Maytenus ilicifolia (Espinheira-santa), Petiveria foetida (Guiné), and Erythrina verna (Mulungu) are used by only 6.67%. Plants such as Curcuma longa (Turmeric), Peumus boldus (Boldo), Dysphania ambrosioides (Mastruz), and Justicia acuminatissima (Sara tudo) have intermediate use, ranging from 40% to 60%. Canna indica (Indian Shot), Palicourea rígida (Douradão), Bryophyllum pinnata (Life Plant), and Melissa officinalis (Lemon Balm) are used by 20% to 33.33% of the population. Most respondents reported using medicinal plants in the form of tea, with knowledge of their use passed down from their ancestors, and that they cultivate these plants at home or obtain them in the neighborhood. The frequency of use is generally twice a day (81.8%), with the remainder using them once a day, for a week. Regarding satisfaction, 63.3% considered the use good, and 36.4% excellent. Only two people mentioned using other medications simultaneously, such as ibuprofen or amoxicillin.

Discussion

The results related to gender may be justified by the greater attention given to details, especially regarding knowledge of medicinal plants, which makes women responsible for acquiring and using them. Our results are similar to those found in a study in the municipality of Oliveira fortes – MG, where 62% of the respondents were women (9). Various ethnobotanical surveys conducted in other locations have shown a greater tendency for the number of respondents to be female (10; 11; 12). Additionally, the results show that not only low-income families have the habit of using medicinal plants, but this practice is also carried out by families of various social classes and income levels. Understanding the socioeconomic profile is important because factors such as occupation, education level, gender, and age can significantly influence traditional knowledge, especially about medicinal plants (14). The results also demonstrate that there is no influence of education level on the use of medicinal plants, as all social classes use them. Most of the mentioned plants are used to treat uterine inflammations, as well as other conditions such as kidney problems, anxiety, colds, and headaches, with most being produced in their own gardens. A study in a quilombola community showed that, despite having a nearby health post, they still use medicinal plants to cure diseases, with most species cultivated in gardens (14). Knowledge about the use of medicinal plants is passed down by older family members such as grandparents, parents, or uncles, as well as by healers or curanderos, who are responsible for formulating medicinal plant remedies to alleviate, prevent, and even cure local ailments. They also know the use of plants considered protective, such as rue, used in popular knowledge to ward off the "evil

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

eye." the elderly population's recognition of knowledge acquired through past generations is evident, as this knowledge is transmitted to others, consolidating family culture (15). Moreover, studies on medicinal plants have been crucial for identifying new drugs of medical and pharmaceutical interest, highlighting the relevance of ethnopharmacological and ethnobotanical approaches in selecting medicinal plants (16). In summary, the study highlights the importance of traditional knowledge about the use of medicinal plants. The use of these plants is common across all social classes and is not influenced by education level, as observed. This knowledge is passed down through generations and is essential for preserving local culture and discovering new medicines. Ethnopharmacological research plays a crucial role in valuing this ancestral knowledge and exploring new drugs.

Keywords

Ethnobotany; Amazon; Traditional Knowledge.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Interference of Extractive Methods to Enhance the Antioxidant Properties of Ginger: a Literature Review

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About this scientific work

DOI: 10.62922/4cbffc.cp077
Link: https://doi.org/10.62922/4cbffc.cp077
Type: Scientific Work.
Area: Integrative and Complementary Practices.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Ginger (Zingiber officinale Roscoe) is a rhizome that has a rich heterogeneity of biologically active compounds, which gives to ginger a wide range of pharmacological properties related to various activities, one of them being the antioxidant property, as well as supports its usability in the treatment of multiple symptoms and some health conditions. However, there are different extractive methods that will enhance these properties of ginger, thus improving its antioxidant activity. The most common methods for food materials are sun drying, oven drying and freeze drying, and the use of extraction solvents such as hot water, aqueous ethanol (80%, v/v) and ethanol (1). Drying is one of the most common methods that aims to remove the water from fresh produce, so when the water content of the sample is reduced, the growth of microorganisms, enzymatic reactions and other harmful changes are inhibited (2).

Aim

This study aimed to evaluate how different extraction methods can affect the antioxidant capacity of ginger, contributing to better understanding of the benefits evolving the ingestion of this rhizome in food and human health.

Methods

A literature review was conducted on extractive methods that enhance the antioxidant property of ginger. The references were obtained through searches on the Scientific Electronic Library Online (SciELO) and the Virtual Health Library (VHL) (PubMed/MEDLINE), using the terms "Zingiber officinale," "Antioxidant Properties," and "Extraction Methods" as DeCS/MeSH descriptors to address the research question. The articles analyzed for this review were published between 2019 and 2023 in journals classified as A2 in the Qualis CAPES strata, according to the Sucupira Platform. The exclusion criteria included unavailable open-access articles, articles not related to the topic, publications with a Qualis CAPES classification lower than B1, and publications with a publication date before 2013.

Results

Studies show that the method of drying in the sun has the advantage of being a sustainable processing method, since sunlight is an essential, abundant, inexhaustible and non-polluting renewable resource, in addition the sun contains Ultraviolet B radiation (UVB), that has a positive impact on the composition and antioxidant activity of fresh ginger (2). Oven drying is commonly used due to the reduction of investment and operational costs, but the high temperature results in a lower quality of the product (1). Despite maintaining the quality attributes of the product, such as nutrients, color, flavor, with indistinguishable changes in the original product, freeze-drying involves high production costs. The sun dried ginger, extracted with ethanol, showed the best result for antioxidant activity when compared to fresh ginger extract. Lyophilized ginger extracts in water showed significantly higher values determination of TPC (Total Phenolic Content), TFC (Total Flavonoid Content), FRAP (Ferric Reducing Antioxidant Power Assay), TAA (total antioxidant activity), ABTS elimination activity and DPPH radical inhibition compared to fresh ginger extracts (1,2). Ethanol was superior to aqueous ethanol in the recovery of phenolic compounds, despite the lower yield (2). In addition, ginger extraction with ethanol exhibited higher antioxidant activity than extracts with aqueous ethanol. Hot water was the least effective solvent for extraction (2). In summary, sun-drying is the most effective and desirable method to preserve and enhance the quality of ginger due to its efficiency in bioactive and cost-effective compounds, followed by oven-dried ginger and, finally, lyophilized ginger (1,2).

Discussion

Most studies have shown significant results regarding the chemical and antioxidant parameters of the plant, with articles consistently highlighting dried ginger as the preferred choice for extraction. The drying method that demonstrated the highest efficiency in recovering the bioactivity of ginger extract products

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

and showed the best cost-benefit ratio was sun-drying. Finally, ethanol extraction proved to be the most effective in obtaining better antioxidant activity from the ginger extract.

Keywords

Zingiber officinale; Antioxidant; Extraction Methods.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Use of Ginger as an Adjuvant Treatment of Chemotherapy Induced Nausea and Vomiting: a Literature Review

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About this scientific work

DOI: 10.62922/4cbffc.cp078
Link: https://doi.org/10.62922/4cbffc.cp078
Type: Scientific Work.
Area: Integrative and Complementary Practices.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Chemotherapy is the most common treatment for cancer all over the world, but it is not free from adverse effects such as nausea and vomiting, the most common and distressing effects experienced by patients receiving this kind of cancer treatment (1,2,3). Frequently, severe nausea, vomiting and retching episodes can unleash a loss of appetite, which leads to nutritional deficiency, decreased immunity and also elicit metabolic disorders and additional adverse outcomes that can affect the patient's quality of life and, as a consequence, the chemotherapy efficacy (1,4). It could also interfere with the oncological

therapy, by leading dose reductions or treatment discontinuation (4,5). In view of this, it is necessary to use pharmacological and non-pharmacological treatments to relieve these harmful symptoms and the non-pharmacological measures could be used as an alternative since they can be considered safe, effective, less risky, and more affordable (1). Recent studies suggest that the bioactive compounds contained within the rhizome of the medicinal plant ginger (Zingiber officinale) could exert a beneficial effect on the symptoms of several chronic conditions and in the reduction of nausea (5,4). In addition to this, the ginger could be used in Chemotherapy-Induced Nausea and Vomiting (CINV) according to some research with oncological patients (5,6,7,8). It is noteworthy that this medicinal plant is a great choice and it is also an important resource for a few treatments, described in the Brazilian Pharmacopoeia supported by studies demonstrating many of its therapeutic activities, which could be used in SUS, the Unified Health System, known as the public health system in force in Brazil (9).

Aim

The purpose of this paper is to broaden the discussion about the use of ginger as an alternative and additional treatment with a view to relieve nausea and vomiting by making a literature review.

Methods

This narrative literature review was carefully developed in which the elected databases were Scientific Electronic Library Online (SciELO) and Medical Literature Analysis and Retrieval System Online (Medline). Only articles written in English and Portuguese, classified as A1, A2, A3 or A4 Qualis CAPES strata papers according to the Sucupira Platform, which were published between 2014 and 2024 with an available DOI were considered for inclusion in this concise review. The descriptors used were “Ginger” and “Chemotherapy-Induced Nausea and Vomiting”, “Zingiber officinale”, “Drug Therapy” and “Nausea”, from DeCS/MeSH finder. It is worthy mentioning that only 2 systematic reviews and meta analysis were evaluated for introduction background and the results were based on clinical trials.

Results

The ginger’s rhizome contains many bioactive compounds like gingerols and shogaols, known for their antiemetic action by inhibiting neurokinin-1, serotonin, and dopamine receptors (10). Until 2017 it was unknown if ginger supplements and food products contain sufficient quantities of the necessary active ingredients to achieve a therapeutic effect or the pharmacokinetics of the ginger, something that required a deep investigation conducted by Marx that concluded that ginger extracts and supplements had higher concentrations of primary compounds, gingerols and shogaols, despite of ginger spices also showed high levels of active components (5). All the clinical trials involving the powder ginger root or the 6-gingerol isolated molecule presented in this review reported the administration of it in association with standard antiemetic drugs recommended in hospital protocols for chemotherapy patients, hence, the ginger is mostly retracted as an adjuvant (3,6,10,11,12,13). Some papers demonstrated that capsules of ginger powder and the ginger extract were effective in reducing these symptoms in different ways, especially in cases evolving the frequency, intensity of nausea and vomiting, also acute and delayed nausea severities decreased significantly (3,6,12). The largest reduction in nausea intensity and

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

incidence was observed with standardized doses of 300mg ginger, containing 21 mg of bioactive compounds (5% gingerols and 2% shogaols), totaling a daily dose of 1.2 g ginger root powder with 84 mg active ingredients (3). In comparison with chamomile, both were significantly effective in reducing the frequency of vomiting, but only ginger had a great influence in the frequency of nausea (12). In contrast, other publications counteract these previous clinical finds since the results are not conclusive when it comes to the effects of ginger related to chemotherapy-induced nausea and vomiting (2,8,11,13,14).

Discussion

The effect of ginger on CINV of all cancers wasn't investigated, it is known that each cancer has a specific therapeutic protocol, and each protocol may exert a different rate of nausea. It is notorious that the activity of ginger in nausea and vomiting has been suggested over the years, however, it designs a few inadequacies, heterogeneity of the studied population, different patterns of chemotherapeutic drugs and valid questionnaires, low quality of tested products without a standardization and lack of dose-finding studies, that limit the possibility to offer generalizable results. More methodologically rigorous studies investigating the effect of ginger on the management of CINV in breast cancer patients are required.

Keywords

Zingiber officinale; Nausea; Chemotherapy.

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DOI: 10.62922/4cbffc
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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Evidences of Lavender Essential Oil in the Management of Anxiety and Sleep Disorders — a Literature Review

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About this scientific work

DOI: 10.62922/4cbffc.cp079
Link: https://doi.org/10.62922/4cbffc.cp079
Type: Scientific Work.
Area: Integrative and Complementary Practices.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Anxiety and sleep disorders are prevalent conditions that significantly affect the quality of life of millions of people around the world. Traditional treatment for these cases includes the use of pharmacological therapies, which, although effective, can present a number of undesirable side effects. However, the use of complementary or alternative treatments has been gaining attention, such as aromatherapy. From this perspective, aromatherapy is a therapeutic practice in which the benefits of essential oils are employed to promote physical, mental, and emotional health and well-being. In this scenario, lavender (Lavandula angustifolia) essential oil has emerged as a promising alternative due to its widely recognized calming and sedative properties.

Aim

To analyze and synthesize the evidence available in databases on the role of lavender essential oil in the management of anxiety and sleep disorders.

Methods

This is a literature review. The analysis searched for articles in the PubMed and Scielo databases using the following terms: "lavender essential oil", "aromatherapy", "anxiety and lavender oil" and "sleep

disorders and essential oils", using the corresponding Boolean operator. The inclusion criteria were articles, clinical trials, and studies published from 2019 to 2024, in Portuguese, English, and Spanish, with free access, full text, and related to the topic.

Results

After reviewing 9 publications, five studies were selected. The results of the studies that evaluated the effect of lavender on anxiety in different contexts (post-cesarean section, mood disorders, sleep disorders, etc.) showed a significant reduction in anxiety compared to control groups (1,2,3,4,5). In addition, studies suggest that lavender may act on anxiety through various mechanisms, including modulation of the central nervous system, an effect on the limbic system, as well as having anti-inflammatory properties that may contribute to reducing anxiety, as chronic inflammation is associated with the disorder (2,3,5). Among the studies, a randomized clinical trial compared the effects of aromatherapy with the essential oils of lavender and another plant on post-cesarean women. The results showed that lavender was more effective in reducing anxiety and the severity of pain compared to the other sample. Participants who used lavender reported a significant decrease in anxiety and pain, also highlighting lavender's potential as a post-operative intervention (4). In addition, it was found that aromatherapy with lavender is generally considered safe when used correctly, without many adverse effects (3). However, it was noted that, especially for specific groups such as pregnant women, nursing mothers, or people with allergies, any clinical symptoms should be observed (3,4). The studies also pointed out that the quality of the lavender essential oil is crucial to guaranteeing its efficacy and safety. Therefore, aromatherapy should be used as part of a comprehensive plan for the management of anxiety and sleep disorders, which may include other therapies and lifestyle modifications (3).

Discussion

The studies reviewed consistently demonstrate that lavender essential oil has properties that are effective in managing anxiety and sleep disorders, such as its anxiolytic and sedative effects. Thus, the presence of bioactive compounds such as linalool and linalyl acetate is fundamental to these therapeutic effects. These compounds interact with the central nervous system, promoting relaxation and reducing neuronal excitability. In this scenario, studies have also explored the nasal administration of natural volatiles, including lavender essential oil, for the treatment of mood disorders. Lavender inhalation was found to be associated with significant improvements in mood and reduced anxiety. The studies highlighted that nasal administration directed at the brain allowed for rapid and efficient delivery of the bioactive compounds, resulting in rapid therapeutic effects (3). Thus, it is possible to reach the upper and lower airways through inhalation and also, through the olfactory nerve, various structures of the central nervous system that can contribute to the control of pain and other symptoms (2). The olfactory pathway has a direct connection with the limbic system (amygdala-hippocampus complex), which is responsible for controlling emotions and influences the nervous and endocrine systems (1,2,3). Regarding the potential of essential oils as multicomponent blends and their impact on human health and well-being, lavender, as part of these blends, has been shown to be effective in promoting relaxation and improving sleep quality. The combination of different essential oils, including lavender, enhanced the therapeutic effects, suggesting a synergistic approach to the treatment of sleep and anxiety

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

disorders (2,3). Furthermore, in the practice of clinical aromatherapy, lavender essential oil has stood out for its calming properties derived from the products that make it up (linalool, terpinene, camphor, etc.), with the ability to improve sleep, such as in cases of insomnia (3). Clinical studies have also shown that inhaling lavender before bedtime increases sleep duration and reduces the latency to fall asleep. In addition, lavender was effective in reducing anxiety in hospitalized patients, providing a non-pharmacological method of managing anxiety (3). However, despite the promising results, it is important to consider the limitations of existing studies. Many studies have small sample sizes and variability in the methods of administration of lavender essential oil. In addition, most studies are of short duration, which limits the understanding of long-term effects. Another essential consideration is the need for standardization of the essential oils used in the studies, as the quality and chemical composition of lavender oil can vary significantly depending on the source and extraction method. In summary, lavender essential oil offers significant promise as a complementary treatment for anxiety and sleep disorders, its use should be considered part of an integrated approach that includes conventional therapies and appropriate professional guidance.

Keywords

Lavender Essential Oil; Aromatherapy; Anxiety.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Review of the Use of Phytotherapy as a Complement to the Treatment of Periodontal Diseases

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About this scientific work

DOI: 10.62922/4cbffc.cp080
Link: https://doi.org/10.62922/4cbffc.cp080
Type: Scientific Work.
Area: Integrative and Complementary Practices.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Phytotherapeutics are obtained exclusively from active vegetable raw materials (comprising the medicinal plant or the vegetable drug or the vegetable derivative), except for isolated substances, with prophylactic, curative or palliative purposes. It can be simple, when the active ingredient comes from a single medicinal plant species, or compound, when the active ingredient comes from more than one medicinal plant species. They are well accepted by the population and show good accessibility to treatments and have a range of applications in different diseases. They have a series of therapeutic effects including anti-inflammatory, anti-halitosis, anti-resorptive, anti-oxidant, antibacterial, antifungal, antiviral properties and other pharmacological activities. They can be used in various pharmaceutical forms such as mouthwashes, gels, oils, dentifrices, aqueous extracts, oral bioadhesives or powders for dental use (1, 2, 3,7). Periodontitis is a multifactorial disease that involves a wide variety of microorganisms that inhabit the oral cavity, concomitant with oxidative stress that occurs from the host's metabolic processes and immune defense mechanisms. Mechanical oral injuries can facilitate the dissemination of pathogens and intensify inflammatory processes and a consequent increase in oxidative stress (3). Some medicinal plants found in the studies reviewed are validated by the National

Agency of Sanitary Surveillance (ANVISA) for use in the Unified Health System (SUS), showing the relevance of the topic for public health in Brazil, including periodontal treatments, that can have an increased arsenal of possibilities for promotion, recovery and maintenance of oral health (4, 5, 6).

Aim

To carry out a narrative review of the main technologies or pharmaceutical forms involved in the use of herbal medicines with anti-inflammatory action in the oral cavity.

Methods

To carry out this literature review, the Scielo and PubMed databases were used. Articles in English and Portuguese, published in the last year, were selected. as inclusion criteria, articles were selected with free access to the full works and studies with results in humans. as an exclusion criterion, studies using animals and isolated active substances were removed, even if they were extracted from plants. Using the descriptors in English and Portuguese: phytotherapy, periodontal diseases and oral cavity in the Scielo database, no results were found. 3 results were found, applying the filter to publications from the last year.

Results

Studies have highlighted the potential of herbal medicines in the oral cavity to treat periodontitis in a complementary or isolated way. The points studied involved the main characteristics of periodontitis such as control of microorganisms growth, reduction of biofilm formation, reduction of oxidative stress, anti-inflammatory action, reduction of gingival bleeding and the possibilities of multiple pharmaceutical forms such as mouthwashes, gels, oils, toothpastes, aqueous extracts, oral bioadhesives or dental powders. The main medicinal plants used in the studies were Vachellia nilotica subsp. tomentosa, Aloe vera, Azadirachta indica, Curcuma longa, Cymbopogon citratus, Camellia sinensis, Ocimum tenuiflorum and Sempervivum ruthenicum. They demonstrated several activities that could be used in other oral pathologies such as anti-inflammatory, antiplaque, antihalitosis, antiresorptive, antioxidant, antibacterial, antifungal and antiviral properties. The findings suggest that herbal medicines can aid periodontitis treatment where there may be a shortage of human and economic resources (1, 2, 3).

Discussion

The medicinal plants cataloged in the National List of Medicinal Plants of Interest to the Unified Health System (RENISUS) (4) and in the 6th Edition of the Brazilian Pharmacopoeia (5) evidenced in the results found were only Aloe vera and Curcuma longa, with Aloe Vera being the only herbal medicine mentioned in the National List of Essential Medicines (Rename, 2022) (6), bringing the possibility of using these medicinal plants by SUS and showing that more studies must be carried out to address this gap in Brazilian legislation around medicinal plants and herbal medicines for the treatment of diseases and use in dentistry (4, 5, 6, 7). The results show that few studies were published in the last year in the selected databases, generating a great opportunity to explore the activities of herbal medicines in periodontics and other areas of dentistry. More clinical studies with herbal medicine applications comparing the best

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

pharmaceutical forms for each oral pathology are urgent to complement the traditional treatment of periodontal diseases and increase the chances of success and control of triggering factors.

Keywords

Medicinal Plants; Phytotherapy; Periodontal Diseases; Gingivitis.

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Scientific Evidence and Health Literacy Regarding the Use of Herbal Medicine Products for Improving Lipid Profile

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About this scientific work

DOI: 10.62922/4cbffc.cp081
Link: https://doi.org/10.62922/4cbffc.cp081
Type: Scientific Work.
Area: Integrative and Complementary Practices.
Received: 24/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

In recent years, Brazil has experienced an escalating prevalence of elevated blood lipid levels (1,2). The prevalence of dyslipidemia can range from 12.20% to 64.25%, depending on the region of Brazil (1,2). The clinical implications of elevated blood lipid levels include an elevated risk of cardiovascular diseases (e.g., acute myocardial infarction and stroke), as well as complications in peripheral vascularization (e.g., as thrombosis and ischemia), resulting in reduced quality of life and a burden on health systems and services (3,4). In addition to conventional treatments for dyslipidemia, such as lipid-lowering drugs and the adoption of a healthy lifestyle including regular physical activity and a balanced diet, herbal medicine products have been used as alternative and complementary therapies in managing these disorders (5). However, it is crucial that the use of herbal medicine products for managing and treating dyslipidemia is based on scientific evidence and conducted under the guidance and prescription of healthcare professionals to ensure effective and safe utilization.

Aim

Based on scientific evidence regarding the effective and safe utilization of herbal medicine products in managing and treating dyslipidemia, it was proposed to enhance health literacy among the population through educational materials distributed on a social network.

Methods

This study was conducted in three main steps: (i) identification of potential herbal medicine products used by Brazilians for managing and treating dyslipidemia; (ii) narrative review; and (iii) knowledge translation. The first step consisted of conducting searches on Google® and Microsoft Bing® to identify potential herbal medicine products used by Brazilians in the management and treatment of dyslipidemia. The searches were guided by the following questions: "Which herbal medicine products or infusions can be used to reduce cholesterol and/or triglycerides?" and "Which herbal medicine products or infusions can be used to increase “good” cholesterol?". Based on the identified herbal medicine products, a narrative review was conducted in the PubMed, Scielo, and Scopus databases. Systematic reviews reporting on the efficacy, effectiveness, and safety of herbal medicine products in managing and treating dyslipidemia were included. There were no restrictions on the characteristics of the population evaluated (age, sex, and type of lipid profile disorder diagnosis or intervention) or on the country of study. Studies conducted on animals or written in non-Roman languages (e.g., Russian, Japanese, and Chinese) were excluded. The screening, eligibility, and methodological quality assessment of the systematic reviews were independently conducted by two researchers (G.S. and G.S.R.). The final step involved knowledge translation to promote health literacy among the population through the social network Instagram®. During this step, educational materials (posts) were created by three graduate students and reviewed by a P.h.D. student and a professor from the School of Pharmacy. Once approved by the professor, the posts have been published on the @encapsulando.unesp profile since August 2023.

Results

Sixteen herbal medicine products suggested by websites as having positive effects on the lipid profile were identified: turmeric (Curcuma longa), garlic (Allium sativum), bergamot (Citrus bergamia), coffee and green coffee (Coffea), black and green tea (Camellia sinensis), cumin (Cuminum cyminum), hibiscus (Hibiscus sabdariffa), canola oil (Brassica napus), coconut oil (Cocos nucifera), rice bran oil (Oryza sativa), olive oil (Olea europaea), palm oil (Elsaeis guineensis), ginseng (Panax ginseng), and psyllium (Plantago ovata). Thus, 16 systematic reviews published between 2013 and 2020 were identified (6–21). 16,164 participants were evaluated, of which 6,049 had levels of total cholesterol (TC), high-density lipoprotein (LDL), low-density lipoprotein (HDL), and triglycerides (TG) within the reference values; 5,706 had cardiovascular risk (diagnosis of hypertension, type 2 diabetes mellitus, overweight, obesity, metabolic syndrome, and non-alcoholic steatohepatitis); and 4,409 had elevated TC, LDL, or TG levels or low HDL. The use of herbal medicine products was associated with improvements in one or more parameters of the lipid profile in 12 out of the 16 studies evaluated (7–10,12–18,20,21). However, the use of coffee, coconut oil, and palm oil was associated with a worsening lipid profile (6,11,19), while the use

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

of black tea had no significant effect on the lipid profile (17). The use of turmeric, garlic, green coffee, green tea, hibiscus, coconut oil, and ginseng was associated with gastrointestinal and skin adverse events, which were classified as non-serious (7,11,15,16,18,21,22). Based on scientific evidence, 22 educational materials were developed, with six focusing on introductory concepts (definition and treatment of dyslipidemia) and 16 addressing the effects of herbal medicine products on the lipid profile. as of now, 13 posts have been published, accumulating a total of 360 likes, 39 comments, and 33 shares.

Discussion

Sixteen herbal medicine products were recommended by websites for managing or treating dyslipidemia, and scientific evidence was identified to support their effectiveness and safety. Among the herbal medicine products evaluated, 12 can improve blood lipid levels through different mechanisms: garlic, bergamot, and ginseng regulate the cholesterol synthesis pathway by decreasing the expression and activity of HMG-CoA reductase, an enzyme involved in cholesterol synthesis (7,20,21); turmeric and green coffee stimulate PPAR-α, a receptor involved in regulating triglyceride levels (15,18); green tea interferes with the formation of lipid micelles, reducing their absorption in the small intestine (16); and psyllium forms a viscous gel that captures lipids, reducing their availability for intestinal absorption (23). Canola, rice bran, and olive oils are sources of unsaturated fatty acids, which have been associated with reduced cardiovascular risk (9,10,12). On the other hand, the use of coconut and palm oil had negative effects on the lipid profile, possibly due to their high concentration of saturated fatty acids, which promote the formation of LDL cholesterol and contribute to atherogenesis (6,11). However, there is a lack of safety data regarding the use of these herbal medicine products, as only seven studies reported adverse events (7,11,15,16,18,21,22). The information mentioned was not available on the websites where the herbal medicine products were identified, especially concerning the adverse events associated with their use. These findings demonstrate that people are increasingly exposed to health information from websites and social networks and often make health decisions based on posts lacking reliable sources and robust scientific evidence (24). Given the situation, this study aims to enhance health literacy on social networks through concise and understandable texts, replacing technical terms with popular synonyms, and using illustrative images sourced from reliable and carefully analyzed information with special attention to the limitations of the scientific evidence (24). The proposal for dissemination on social networks, engaging more than 1,200 accounts, aims to present reliable information based on scientific evidence (24). This initiative counters misinformation and fake news on the subject, encouraging users and health professionals to critically reflect before making decisions (24). Therefore, while herbal medicine products can be used in the alternative and complementary treatment of dyslipidemia, their use should be substantiated by scientific evidence that confirms their effectiveness and safety. In this sense, health literacy on social networks can support the decision-making process in self-care and responsible self-medication. Funding: This study was financed by Fundação de Amparo à Pesquisa do Estado de São Paulo –FAPESP [funding numbers 2022/14307-0 and 2023/03911-6] and Pró-Reitoria de Extensão e Cultura (PROEC). This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) – Código de Financiamento 001.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Hypercholesterolemia; Knowledge Translation; Health Literacy.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Validation of Instruments for Measuring Adherence to Immunosuppressive Therapy in Brazil: a Scoping Review

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About this scientific work

DOI: 10.62922/4cbffc.cp082
Link: https://doi.org/10.62922/4cbffc.cp082
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Adherence to immunosuppressants is crucial to prevent infection of the transplanted organ, as well as to avoid serious adverse effects of surgery and increase patient survival (1). In clinical practice, knowledge of how adherence to immunosuppressants is estimated is limited. Understanding non-adherence factors is essential to prevent late graft failure in transplant patients (2). In Brazil, the country with the largest public transplant program in the world, the general prevalence of non-adherence to immunosuppressants is around 40% (3). One of the ways to understand the reasons for non-adherence

is to use validated self-report instruments. Self-report instruments are structured questionnaires with strategic items that aim to assess the level of adherence. Furthermore, they are low-cost, simple, and easy to apply, facilitating their incorporation into public services (4).

Aim

To identify self-reported medication adherence measures for patients using immunosuppressive medications validated in Brazil.

Methods

A scoping review of the literature was carried out following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, with the research question being: "What self-report instruments are used to measure medication adherence in transplant patients using immunosuppressants validated in Brazil?" the searches were carried out in September 2023, in the PubMed, Scopus, Embase, LILACS, and Web of Science databases. The descriptors used were “medication adherence”, “Immunosuppressants” and “transplant” (5). The inclusion criteria were: (a) validation studies of a self-report instrument to measure adherence in patients using immunosuppressants (b) study in Portuguese, English, or Spanish. The selection of articles was carried out by two reviewers according to the eligibility criteria and disagreements were decided by a third evaluator.

Results

In the initial search, 44 articles were identified. After excluding duplicates, 15 remained, of which 7 (3,6,7,8,9,10,11) were included in the final analysis. Of these, 6 used the Basel Immunosuppressive Medication Adherence Assessment Scale (BAASIS) and 1 used the Immunosuppressive Therapy Adherence Scale (ITAS). The instruments were validated for patients undergoing kidney and liver transplantation. Both instruments contain 4 items, each related to one of the adherence domains, specifically behavior. Regarding psychometric properties, the BAASIS demonstrated content, criterion, and construct validity, while the ITAS demonstrated only criterion and construct validity. In the reliability analysis, the BAASIS presented internal consistency results of 0.7 and test-retest reliability of 0.88, while the ITAS presented an internal consistency result of 0.83.

Discussion

All studies involving kidney transplant patients used the BAASIS scale, originally developed in English and specific for immunosuppressants. The study involving liver transplant patients used the ITAS scale, also originally developed in English. Regarding the domains of medication adherence addressed by the instruments, both used the behavior of taking medication, which is based on the number of doses ingested, without evaluating other domains such as barriers and beliefs about the health status and the medication (12). Furthermore, in the analysis of the psychometric properties of validity, both considered the structure of the scale and the correlation between the items and external variables, but only BAASIS analyzed the clarity of the content. In terms of reliability results, the two scales presented good internal

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

consistency results as both had results close to 1 in the test-retest, and BAASIS presented satisfactory results (13) Therefore, although BAASIS presents more criteria, the two scales have validity and reliability and can be employed for accurate adherence measurement. However, Further research and validation of new scales is necessary to increase the number of tools available to assess adherence to immunosuppressants.

Keywords

Medication Adherence; Immunosuppressants; Transplant.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Analysis of Pharmacotherapy for Central Diabetes Insipidus Available in the Single Health System of Brazil

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About this scientific work

DOI: 10.62922/4cbffc.cp083
Link: https://doi.org/10.62922/4cbffc.cp083
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Diabetes insipidus (DI) or arginine vasopressin deficiency is a rare disorder characterized by polydipsia and hypotonic polyuria, that is, the patient presents intense thirst and high urinary output, with the consumption of more than 3 liters of water and more than 50 ml of diluted urine per body weight per day (1,2). Arginine vasopressin (AVP) or antidiuretic hormone is the main substance involved in water homeostasis, promoting its retention in the body in cases of deprivation of water intake (3). AVP is synthesized in the hypothalamus and stored in the posterior pituitary gland; changes in production and release and its action in the kidneys are the causes of DI (4). This disease can occur in both men and women of equal proportion and age, and can be classified as nephrogenic, gestational or central. In the nephrogenic type, there is resistance of vasopressin or aquaporin 2 receptors in the nephrons, while in the gestational type there is a high degradation of vasopressin by placental enzymes, and in the central type there is an absence of secretion or low secretion of vasopressin due to damage or destruction of hypothalamic neurons. Central Diabetes Insipidus (CDI) has as its etiology: damage to the vasopressinergic neurons of the hypothalamus by neoplasms; autoimmune destruction of neurons; traumatic damage from brain injury or surgery; infectious agents, among others. The origin of CDI is acquired or congenital (2,5). In Brazil, pharmacological therapy for central diabetes insipidus approved by the National Health Surveillance Agency (ANVISA) was incorporated into the Unified Health System

(SUS), after approval by the National Commission for the Incorporation of Technologies in the Unified Health System (CONITEC), and supplementation with an AVP analogue (6).

Aim

To analyze the pharmacological treatment of central diabetes insipidus and its adverse effects presented in the literature, as well as the pharmacotherapy approved by CONITEC and incorporated into the SUS.

Methods

A literature review was carried out on the following platforms: SciELO, PubMed and LILACS. The search strategies were developed using the descriptors: “diabete insipidus”, “drug trerapy”, “SUS”, in Portuguese, English and Spanish, using the Boolean operator, “AND”. The search for bibliographic material was from 2014 to 2024, using exclusively articles that deal with DI in humans. Seven articles were found in the PubMed database, but after reading we chose three articles, and one article and the Clinical Protocol and Therapeutic Guidelines (PCDT) for diabetes insipidus from 2017 in the LILACS database, however a more recent PCDT search was carried out published in 2018 on the CONITEC website.

Results

The pharmacotherapy of central diabetes insipidus reported in the literature, in the four articles analyzed, both in adults and pediatric patients, is the use of the analogue of endogenous arginine vasopressin, desmopressin (5), and the main adverse effect reported is dilutional hyponatremia, or in other words, the patient may experience dysregulation in sodium levels and diuresis (7). This drug is administered orally; nasal; and subcutaneous. It has a longer half-life than the endogenous hormone and has high selectivity for vasopressin receptors in the kidneys (2). However, hyponatremia, the reported adverse effect, may be associated with risk factors, such as: existing comorbidity; drug interaction; intercurrent illnesses; and advanced age. For pediatric patients, due to limited studies, the dosage is recommended according to weight and age. as for neonatal patients, it is reported to be administered sublingually, in a dosage every 12 hours, in dosages of 2 to 5 mg/kg/day. In all patients, monitoring is required to adjust the dose and reduce adverse effects (8,9). In the SUS, according to the Clinical Protocol and Therapeutic Guidelines for diabetes insipidus of the Ministry of Health, desmopressin is the drug available for pharmacological treatment, being dispensed in pharmaceutical form for nasal application, solution or spray, 0.1 mg/mL and oral with tablets of 0.1 and 0.2 mg (6).

Discussion

It is concluded that desmopressin is effective for the treatment of central diabetes insipidus and that its adverse effects can be controlled, through monitoring and dose adjustment, when necessary, in any age group, providing health and quality of life. Within the scope of the SUS, the medication is dispensed free of charge to patients who are diagnosed and meet the criteria present in the Clinical Protocol and Therapeutic Guidelines for diabetes insipidus from the Ministry of Health.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Central Diabetes Insipidus; Desmopressin; SUS.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Bancroftian Filariasis: a Review of the Current Pharmacological Treatment Strategy

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About this scientific work

DOI: 10.62922/4cbffc.cp084
Link: https://doi.org/10.62922/4cbffc.cp084
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Bancroftian Filariasis (FB) is a neglected disease caused by the nematode species Wuchereria bancrofti (1), which can be transmitted through the bite of infected mosquitoes, especially those from the genera Culex, Aedes, and Anopheles (2,3). The disease has a wide spectrum of clinical manifestations, ranging from asymptomatic forms to irreversible ones (1). Acute manifestations are associated with retrograde lymphangitis, while the chronic form is characterized by lymphedema, hydrocele, chyluria, and elephantiasis (1). Additionally, it is noteworthy to highlight the social and psychological stigmatization of

patients due to the physical deformities associated with this protozoan disease (4). Therefore, disease control through preventive measures is necessary, such as mosquito control and health education for exposed communities (2). Furthermore, pharmacological treatment has a limited therapeutic arsenal, which stimulates the search for new strategies, such as the combination of already used drugs, to mitigate the possible damage caused by LF (1,4).

Aim

To conduct a literature review of the current pharmacological approach used in the treatment of Bancroftian filariasis.

Methods

This is a narrative literature review (5), analyzing research on isolated or combined drugs for the pharmacological treatment of Bancroftian filariasis, published in Portuguese or English between 2019 and 2023. Data were extracted from the databases Lilacs (Latin American and Caribbean Center on Health Sciences), Scielo (Scientific Electronic Library Online), and PubMed. For article searches, the following terms were used: 1) Bancroftian filariasis; 2) Wuchereria bancrofti; 3) Pharmacological treatment; 4) Bancroftian filariasis; and 5) Pharmacological treatment. The above keywords were combined using the Boolean operator “AND” (5). Exclusion criteria included course completion papers, monographs, dissertations, theses, editorials, and studies not dealing with isolated or combined drugs for the pharmacological treatment of Bancroftian filariasis. These measures were central to ensuring the coherence and relevance of the information analyzed in the review.

Results

In total, 35 studies were analyzed, but only 7 were used to compile the results.In the analysis of drugs used for the treatment of Bancroftian filariasis, it was highlighted that the most effective approach was a single dose of combined administration of Ivermectin (IVA), Diethylcarbamazine (DEC), and Albendazole (ALB) (6). However, there were limitations to this treatment because most people who received the therapy did not achieve complete elimination of the parasite antigen, leading to the hypothesis that this triple administration, intended to sterilize adult worms, did not kill all of them, so the survivors were able to reproduce and produce the microfilarial (Mf) form of the parasite (7). Subsequently, other studies were also analyzed with the combined use of other drugs, such as the simultaneous use of ALB and IVA, which proved beneficial in reducing the Mf form of the parasite in the human body (8). Similarly, the combination of IVA and ALB showed a significant reduction in prevalence from 35.1% to 1.7% when exposed to the measurement of the filarial antigen in the blood through the enzyme-linked immunosorbent assay (9). It is also noteworthy that, when comparing the administration of Ivermectin-Diethylcarbamazine-Albendazole (IDA) and Diethylcarbamazine-Albendazole (DA), it was observed that participants who received the DA treatment had a 4 times greater likelihood of not eliminating Mf compared to IDA (10). In this comparison, another study showed that, within 24 hours, when IDA was applied, complete Mf elimination was 89%, whereas with DA it was only 30%. After 12 months of treatment, only 4% of IDA recipients had Mf in the blood, whereas 40% of DA recipients still had the

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

parasite (11). Another comparison was made between treatments of IDA and Ivermectin and Albendazole (IA). The result showed that the inactivation of adult worms was higher with IDA treatment than with IA (12).

Discussion

The Global Program to Eliminate Lymphatic Filariasis (GPELF) is a preventive chemotherapy action for administering mass medication. Annually, a single dose of two medications is given to the population. In Africa, the World Health Organization (WHO) recommends the combined use of ivermectin and albendazole (13). In this context, ivermectin (IVA), produced by the bacterium Streptomyces avermitilis, functions as an anti-parasitic in the avermectin group, with a paralyzing effect on invertebrates, affecting their reproduction and consequently promoting a reduction in this group (13). Ivermectin acts on chloride channels regulated by gamma-aminobutyric acid (GABA), particularly on chloride channels blocked by glutamate (GluCl). Additionally, the drug also affects GABAergic receptors, histaminergic receptors, and pH-sensitive chloride channels (6,13). Thus, when GluCls promote greater permeability to chloride ions, there is hyperpolarization of the cell membrane and blockade of the inhibition of neuromuscular transmission, leading to paralysis and death of invertebrate parasites (13). However, when doses are close to 200 micrograms/kg, there is an increase in GABAergic transmission and consequently severe symptoms affecting the Central Nervous System of humans, such as dizziness, headache, and high fever (13). Albendazole (ABL), a benzimidazole, is related to the blocking of microtubule polymerization, which promotes the death of the parasite by destabilizing the cytoskeleton and impairing its movements, feeding, and reproduction (6,13). Furthermore, the action of diethylcarbamazine (DEC) is multifaceted and involves various phases: microfilaricidal and macrofilaricidal. The microfilaricidal effect acts on the neuromuscular component of the microfilarial form of the parasite and on the host's white blood cell count, increasing eosinophil levels. While the mechanism of the macrofilaricidal effect is unknown, it is known that DEC has some effect on the adult forms of the nematode (13). Thus, the results showed that the triple therapy IDA (which includes ivermectin 200 µg/kg, DEC 6 mg/kg, and albendazole 400 mg) is more effective in combating filariasis than the WHO's recommendation. This is justified because albendazole reduces the parasitic load of the host, ivermectin removes the microfilarial forms of the parasite, and DEC is effective against microfilariae. Additionally, ivermectin and albendazole do not affect adult worms, leaving the IDA treatment to predominantly eliminate both microfilariae and adult forms of the nematode (7,11,13). It is worth noting that preliminary studies have not demonstrated any clinically harmful interaction between these three drugs. Moreover, this combination contributes to reducing the dose, adverse effects, and resistance phenomena (14,15,16). Therefore, it is emphasized that the triple therapy has proven to be more effective than the dual therapy in individuals infected with Wuchereria bancrofti.

Keywords

Elephantiasis; Anthelmintics; Drug Therapy Combination.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmacology of Chagas Disease: Licensed Drugs and New Molecules with Anti-Trypanosoma Cruzi Potential

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About this scientific work

DOI: 10.62922/4cbffc.cp085
Link: https://doi.org/10.62922/4cbffc.cp085
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

American trypanosomiasis, Chagas disease (CD), or schizotrypanosomiasis, is an anthropozoonosis caused by the protozoan Trypanosoma cruzi, which belongs to the order Kinetoplastida, family Trypanosomatidae, and subgenus Schizotrypanum. This pathogen parasitizes vertebrate hosts and can be found in various natural ecotopes (1). Human infection can occur through four routes: transfusion, vectorial, vertical or congenital, and oral, with the latter being the most common mode of transmission. Additionally, accidental contamination in the laboratory during biological analyses can also occur,

although to a lesser extent (2). CD can present as an acute phase and a chronic phase. The acute phase is characterized by fever, headache, swelling of the face and legs, as well as the presence of Romaña's sign and/or inoculation chagoma, whereas the chronic phase involves the enlargement of essential organs such as the heart, esophagus, and colon (2,3). Pharmacological treatment is limited, with only two substances approved for this purpose: benznidazole (BZ) and nifurtimox (NF) (4). However, it is noteworthy that resistance phenomena and the limited effectiveness of these drugs in the chronic phase of the disease highlight the need for new substances with anti-Trypanosoma cruzi potential.

Aim

To conduct a bibliographic review of drugs used in clinical practice for conditions different from CD but with potential for treating this protozoan disease, as well as to investigate new molecules with anti-Trypanosoma cruzi potential.

Methods

This is a narrative bibliographic review (5) that analyzed research on drugs used to combat American trypanosomiasis, published in Portuguese or English between 2013 and 2023. Data were extracted from Lilacs (Latin American and Caribbean Health Sciences Center), Scielo (Scientific Electronic Library Online), and Medline via Pubmed. The search for articles used the following terms: 1) Chagas Disease; 2) Trypanosoma cruzi; 3) Pharmacotherapy; 4) Adverse effects; 5) Chagas Diseases; 6) Pharmacotherapy; 7) Adverse effects, used both individually and in various combinations with the boolean operator "AND". Studies addressing the topic and published between 2013 and 2023 in English or Portuguese were included. Editorials, dissertations, and theses were excluded.

Results

Out of 70 articles searched, only 12 were used to compose the results. It was observed that, concerning the current pharmacotherapy for CD, only two drugs are used in therapy: benznidazole and nifurtimox (6, 7). Other substances with potential anti-Trypanosoma cruzi activity that are used in clinical practice for conditions different from CD have shown effectiveness such as posaconazole, albaconazole, ravuconazole, itraconazole, benidipine, and clomipramine. New molecules like D0870 and TAK-187 also show promising activity against T. cruzi. D0870 has been analyzed as a potential alternative for strains resistant to benznidazole and nifurtimox, showing efficacy in both the acute and chronic phases of the disease using rats as an experimental model (8). Additionally, posaconazole is an antifungal agent that inhibits the development of T. cruzi cells in vitro and possibly causes cell death of the parasite (9). Albaconazole, although not effective against all strains of T. cruzi, showed a high cure rate in animal models when exposed to strain Y, but resistance was observed with strain Berenice-78 (9, 10, 11, 12). Meanwhile, TAK-187 demonstrated success in the acute phase both in vitro and in vivo, including against strains resistant to nifurtimox and benznidazole, with cure rates of 60-100% and 56% in the chronic phase (10,13,14). Ravuconazole achieved 70% cure for the parasite and 100% survival in rats infected with strain Y, but was ineffective in the chronic phase or against resistant strains (15). Itraconazole, a widely used antifungal in Brazil, was able to halt or slow the progression of the chronic phase of Chagas

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

disease in animals by inhibiting the parasite's membrane substances (7). Benidipine reduces parasitemia by blocking cysteine protease, which inhibits the protozoan's life cycle and its interactions with the host (7, 16, 17), and clomipramine, a tricyclic antidepressant, also reduces parasitemia and promotes survival of infected animals (14).

Discussion

Currently in Brazil, BZ is primarily used against Chagas disease. However, NF is used when recurrence occurs that prevents the use of BZ (18,19). In this context, NF inhibits the growth of T. cruzi intracellularly, particularly in the blood form, but its use presents adverse effects on the skin and digestive and nervous systems. BZ, on the other hand, can cause symptoms such as hypersensitivity, bone marrow depression, and nervous problems. Despite this, BZ remains the most recommended drug for acute Chagas disease as it is less toxic than NF (6,7). The drugs D0870 and posaconazole are particularly relevant due to their action in both acute and chronic phases and their effectiveness against strains resistant to NF and BZ (7). Combining posaconazole with BZ has shown effective and rapid results in the acute phase of the disease, controlling parasitic load and reducing myocardial lesions (8). When comparing TAK-187 and albaconazole, a difference in half-life is noted, with TAK-187 having a long half-life and reducing cardiac degradation, whereas albaconazole has a short half-life and effectiveness varies depending on the strain (10, 11, 14). Ravuconazole, with a short half-life, also failed to work in the chronic phase or against resistant strains, similar to albaconazole (15). Itraconazole, in addition to blocking or slowing disease progression, improved some cardiac abnormalities (7). Specifically, antifungals like albaconazole, itraconazole, ketoconazole, posaconazole, and ravuconazole, which are CYP51 inhibitors, have shown activity against T. cruzi by inhibiting the synthesis of ergosterol in the parasite. The efficacy of this drug class has been demonstrated in several experimental models with high cure rates observed in mouse and dog infections (8). Benidipine reduced parasitemia and inflammation in infected individuals, while clomipramine, by inhibiting the enzyme trypanothione reductase, induced oxidative stress in the parasite in vitro, causing cellular damage (7,17). Thus, it is evident that new substances, as well as drugs already used in the treatment of other clinical conditions, show potential as new tools for the anti-Trypanosoma cruzi pharmacotherapeutic arsenal.

Keywords

Chagas Disease; Trypanosoma Cruzi; Pharmacology.

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DOI: 10.62922/4cbffc
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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Association of Vitamin B12 Deficiency and Metformin Use: Mechanisms and Clinical Implications

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About this scientific work

DOI: 10.62922/4cbffc.cp086
Link: https://doi.org/10.62922/4cbffc.cp086
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 03/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Diabetes Mellitus (DM) is the most prevalent metabolic disease in the world, considerably affecting Brazilian health care, with 6.9% of the population being affected by this chronic condition(1). This disease is characterized by the body's inability to produce or absorb insulin, a pancreatic hormone essential for regulating blood glucose levels and providing energy for the cells(2). Type 2 DM (DM2), marked by resistance to insulin, triggers a broad range of acute and degenerative complications that can significantly impact the patient's quality of life, such as hyperosmolar hyperglycemic state, acute

myocardial infarction, and microangiopathy(3). Metformin is used as a first-line treatment for the glycemic control of DM2, either as monotherapy or in association with other drugs, due to its safety, efficacy, and tolerability even at high concentrations(4). This oral hypoglycemic agent, representative of the pharmacological group of biguanides, works by stimulating AMP-activated protein kinase (AMPK), an enzyme that regulates lipid biosynthesis, consequently reducing hepatic glucose production and increasing carbohydrate absorption(5,6).. Despite not having a fully elucidated mechanism, the use of metformin can interfere with the intestinal absorption of vitamin B12, potentially leading to its deficiency(7). Vitamin B12, also known as cobalamin, participates in the regulation of blood levels of homocysteine, a non-protein sulfur amino acid that, in high concentrations, can cause irreversible damage to the cardiovascular, blood, and nervous systems(8). Therefore, the relation between B12 vitamin and continuous use of metformin has become a point of interest for individuals with DM2.

Aim

To point out evidence that points to the risk of vitamin B12 deficiency in type 2 diabetic patients who are treated with metformin.

Methods

This is a literature review. The analysis searched for articles in the PubMed, Scielo and Google Scholar databases. The Health Sciences descriptors “diabetes”, “metformin” and “vitamin B12” were used. as inclusion criteria, articles and clinical trials published in Portuguese, English, and Spanish between 2016 and 2024 were chosen. Repeated articles, reviews, and states unconnected to the topic were excluded from the analysis.

Results

The search for studies resulted in 15 articles being identified. Of these, only 4 were used, according to the exclusion criteria. Currently, studies show that serum vitamin B12 levels do not reflect intracellular concentration(9,10). Furthermore, hypocobalaminemia in patients using metformin is highly attributed to interference with the absorption of the vitamin B12-intrinsic factor complex, a calcium-dependent process that occurs in the ileum(9). The determination of homocysteine as a biomarker points to an inversely proportional relationship with serum cobalamin levels, indicating that vitamin B12 deficiency occurs at the tissue level(9,11). Daily doses of metformin greater than 1500 mg are considered a risk factor(10,11,12). Studies indicate that 1 mg of metformin reduces serum cobalamin levels by 0.142 pg/mL and that 1 year of use increases the risk of vitamin B12 deficiency by 13%(9,11). Although anemia and neuropathy are common manifestations in metformin users, distinguishing causes related to vitamin B12 deficiency and diabetes is clinically challenging, especially in outpatients(9,11,12). There are still no specific protocols to identify this complication, however some criteria can help the diagnosis: assessment of circulating and metabolic biomarkers, and be carried out in patients with clinical evidence of deficiency, prolonged treatment, advanced age, high doses, concomitant use of acid suppressants, and/or the presence of other comorbidities that increase the risk of vitamin B12

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

deficiency, such as intestinal parasites, gastrointestinal diseases, and atrophic gastritis, among others(11).

Discussion

The studies presented in this review have shown that metformin affects vitamin B12 absorption mostly on a tissue level. They also indicated that B12 hypovitaminosis implies a reduction of cobalamin levels in a dose-dependent manner. But unfortunately, the mechanism of this effect has not yet been described. Homocysteine can be used as a clinical biomarker for perceiving cobalamin-B12-dependent depletion. Despite the results presented in this review, the use of metformin should not be suspended in DM2 treatment, and vitamin B12 supplementation may be a preferable ally in preventing clinical hypovitaminosis during the treatment.

Keywords

Metformin; Diabetes; Vitamin B12.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Identification of Socioeconomic Characteristics of People with Diabetes Mellitus in a Municipality of Curimataú Paraibano

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About this scientific work

DOI: 10.62922/4cbffc.cp087
Link: https://doi.org/10.62922/4cbffc.cp087
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Diabetes mellitus (DM) is a varied metabolic condition characterized by hyperglycemia, resulting from issues in insulin action or production, or both. This continuous imbalance in glucose metabolism, with elevated blood sugar levels, can cause acute or chronic complications in the cardiovascular, renal, and neurological systems (1). DM is one of the most prevalent diseases worldwide (2). In 2015, it was estimated that 14.3 million people in Brazil were living with some form of diabetes, including diabetes mellitus (DM). This number could reach 23.3 million by 2040 (3). Research providing information on the

gender, age range of patients, and other social variables is important as the data can be used as a basis to develop campaigns about DM. Furthermore, considering that no studies have been conducted in the municipality of Cuité/PB to assess the profile of individuals living with DM, this study aimed to investigate these variables in these patients.

Aim

To identify the sociodemographic profile by investigating variables such as gender, age, marital status, educational level, occupation, and monthly income of individuals living with DM in the municipality of Cuité, Paraíba.

Methods

This is a cross-sectional, quantitative, and descriptive study. The sample consisted of 100 users of the Basic Pharmacy in the municipality of Cuité/Paraíba, using antidiabetics duly prescribed by a qualified professional and dispensed at the Basic Pharmacy. The data collection instrument was a questionnaire containing both objective and subjective questions. Each variable in the questionnaire was presented clearly and objectively. The inclusion criteria for the study were: being a resident of the municipality and a user of the Basic Pharmacy service, being diagnosed with DM, agreeing to participate in the study, and signing the Informed Consent form. Users who did not meet the inclusion criteria, refused to participate in the study, had cognitive deficits, or communication disorders were excluded from the study. Data analysis was performed using Microsoft Excel version 2016.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

The research revealed a predominance of women (62.0%) in the sample. Regarding age, the age group of 60 years or older was highlighted (66.0%), with those aged between 30 and 59 also having significant representation (27.7%). In terms of marital status, the majority declared themselves married (55.0%), followed by single individuals (21.0%). Regarding the educational level, a high percentage of people with low educational attainment was observed, with the highest prevalence among individuals who had only studied elementary school without necessarily completing it (58.0%), followed by illiterates (28.0%); few reached higher education without necessarily completing it (2.0%). Regarding professional occupation, most reported being retired (67.0%), followed by farmers (11.0%). Concerning the family nucleus, there was a predominance of families with 1 to 3 people (62.0%), followed by families with 4 to 6 members (30.0%). Regarding family income, the study showed that the majority of participants receive a monthly amount of 1 minimum wage (43.0%), followed by those receiving around 2 minimum wages (38.0%). as for the place of residence, the majority of respondents reside in urban areas (80.0%).

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

The predominance of women may be related to a greater tendency for women to seek health services and a higher awareness of the importance of health care (4). The high presence of participants aged over 60 demonstrates that aging increases the incidence of DM (5). Marital status generally does not have a direct relationship with DM (6). The predominance of married individuals may be related to the age group, as there was a significant percentage of individuals over 30 years old. Low educational attainment reflects the reality of many inland municipalities in the northern and northeastern regions, where a large portion of the population did not have the opportunity to access education in their youth, resulting in low levels of education in adulthood (7). The age group also relates to the high number of retirees over 60, an age group where type 2 DM symptoms commonly appear (8). Income and the number of family members are associated with the age of the participants and the departure of children from home. The greater presence in urban areas is related to the difficulty of accessing the Basic Pharmacy for those living in rural areas. Finally, the results show that individuals living with DM and using antidiabetics dispensed by the Basic Pharmacy in Cuité/PB are predominantly female, aged 30 years or older, generally married with low educational attainment, and either retired or farmers. Most of these individuals belong to families of 1 to 3 members with a monthly income around the minimum wage, residing in the urban area of the municipality. Through this study, it is possible to plan future health education campaigns to improve the quality of life of individuals living with DM.

Keywords

Diabetes Mellitus; Drug Therapy; Drug.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Profile of the Use of Antidiabetics Drugs in the Municipality of Cuité/PB

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About this scientific work

DOI: 10.62922/4cbffc.cp088
Link: https://doi.org/10.62922/4cbffc.cp088
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Diabetes mellitus (DM) is a chronic metabolic disorder classified into type 1 (DM1) and type 2 (DM2). Both types are characterized by hyperglycemia resulting from either insufficient insulin production by the pancreas or the body's inability to effectively use the insulin produced (1). For DM1, treatment involves insulin replacement therapy as soon as the disease is diagnosed. Subsequently, therapeutic regimens are used to help maintain glycemic targets within normal limits (2). In the case of DM2, various classes of antidiabetic drugs are employed. The primary goal for managing both DM1 and DM2 is to achieve

normoglycemia. Antidiabetic medications are therefore prescribed to lower and stabilize blood glucose levels, which is crucial for disease management and the prevention of complications (3). Antidiabetic drugs can be classified into several categories: sensitizers (biguanides and thiazolidinediones), secretagogues (sulfonylureas and meglitinides), carbohydrate digestion inhibitors (α-glucosidase inhibitors), incretin mimetics (GLP-1 receptor agonists and DPP-4 inhibitors), amylin analogues, and sodium-glucose co-transporter 2 (SGLT2) inhibitors (4). Monitoring the use of these medications in specific populations is crucial for promoting the rational use of drugs, ensuring patient well-being, and providing appropriate pharmacotherapy. Additionally, there are currently no studies of this kind conducted in the municipality of Cuité/PB.

Aim

To assess the profile of antidiabetic drug use among the population of the municipality of Cuité who are served by the Basic Pharmacy.

Methods

Method: This study was a cross-sectional, quantitative, and descriptive analysis (5, 6). The sample included 100 participants residing in the municipality of Cuité/PB, who were using medications for the treatment of DM and obtained their medications through the municipality's Basic Pharmacy. Data were collected using a questionnaire that addressed the pharmacotherapeutic profile of the participants and their knowledge about antidiabetic drugs. The questionnaire was administered after medication purchase, with participants being informed about the study's purpose and asked to sign a Free and Informed Consent form (FICF). to take part in the study, users had to live in the municipality of Cuité/PB, use the Basic Pharmacy service, have a diagnosis of DM, voluntarily agree to take part in the study and sign the FICF. People who did not meet the inclusion criteria or who refused to take part after the study had been explained to them were excluded. The study followed the ethical aspects of research involving human beings, as recommended by Resolution 466/2012 of the National Health Council / Ministry of Health and was previously approved by the Research Ethics Committee Involving Human Beings, under opinion: 3.155.466 (CAAE: 04668818.7.0000.5182). The data obtained was transferred to Microsoft Excel for tabulation, cross-referencing and statistical analysis.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

Out of the 100 participants, 75.0% reported using insulin, and 60.0% indicated the use of additional antidiabetic medications. Among those using antidiabetic drugs, 80.0% were on metformin, while 33.3% used glibenclamide. Regarding medication guidance, 93.0% of respondents reported receiving instructions on the correct use of their medications, whereas 7.0% did not. Of the participants using insulin, 75.0% received guidance on the transportation and storage of the drug. Additionally, 16.0% of the participants had discontinued their treatment at some point. In terms of adverse effects, 81.0%

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

reported no undesirable effects, while 19.0% experienced some negative effects during their pharmacotherapy. Concerning symptom improvement, 91.0% of the participants noted a reduction in their DM symptoms, while 9.0% reported no improvement.

Discussion

The results reveal a predominant use of insulin, which is the primary treatment for DM1 (2). A study conducted in Ecuador found that 44.4% of patients were using insulin, while 47.7% were using other antidiabetic medications (7). It's worth noting that another program, “Aqui tem Farmácia Popular,” also provides antidiabetic medications free of charge in addition to the Basic Pharmacy, which could have influenced these results. The high prevalence of metformin usage is consistent with its status as the first-line treatment for DM2, especially for cases involving mild hyperglycemia, obesity, and insulin resistance (8). Regarding medication guidance, a significant proportion of participants reported receiving instructions on proper medication use, administration routes, and dosages. However, research indicates that many patients using antidiabetic drugs lack comprehensive knowledge about their condition and medications, which can hinder the rational use of these drugs (9). When it comes to transporting and storing insulin, although most had received guidance, some interviewees described storing insulin without refrigeration. Others stored it in the fridge but kept it in the insulated container used for transportation, which did not guarantee adequate refrigeration. This data demonstrates the need for intensified guidance. The importance of not interrupting treatment has also been observed in other studies, indicating that care emphasizing this aspect has been relevant (10). Regarding the portion of participants who reported undesirable effects, some antidiabetic drugs can cause issues such as dizziness resulting from metabolic disturbances like hypoglycemia, hyperglycemia, and hyperinsulinemia (11). Diarrhea is a common undesirable effect usually associated with metformin (12). Most participants reported improvement after starting pharmacological therapy. However, those who were dissatisfied with the therapy are likely to discontinue treatment without consulting a professional, a concerning issue that requires attention from healthcare teams (13). The results indicate that insulin and metformin are the most used antidiabetic medications. Most participants receive adequate information regarding the use, storage, and transportation of these drugs, do not interrupt their treatment, experience minimal undesirable effects, and show improvement in DM symptoms. This underscores the critical role of the pharmacist in providing appropriate guidance to ensure effective pharmacotherapy.

Keywords

Hypoglycemic Agents; Drug Therapy; Drug.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Anticancer Effect of Coumarin Compounds: a Literature Review

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About this scientific work

DOI: 10.62922/4cbffc.cp089
Link: https://doi.org/10.62922/4cbffc.cp089
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

According to the World Health Organization (WHO), cancer is a significant group of diseases characterized by the rapid proliferation of abnormal cells, which can surpass their normal boundaries, invade adjacent tissues, and spread to other parts of the body. For lung cancer, chemotherapy remains the predominant treatment since most patients are diagnosed at advanced stages, rendering surgery impractical (1). The search for more effective and selective antitumor drugs, as well as new strategies to halt malignant tumor progression, is becoming increasingly relevant. Natural compounds are emerging as promising alternatives in drug development due to their vast structural and functional diversity, allowing for chemical modifications to enhance pharmacological activity and reduce toxicity (2). However, the extraction of natural compounds often presents challenges such as complexity and low yield. Concurrently, the demand for rapid solutions by the pharmaceutical industry has driven advancements in organic synthesis. This field is crucial for exploring new chemical structures and identifying unexploited macromolecular targets, facilitating the discovery of new drug prototypes with various activities (3). In this context, coumarins stand out as important secondary metabolites found in various plants, fungi, and bacteria. Coumarins possess a chemical structure composed of fused benzene and α-pyrone rings, which provides a favorable configuration for the synthesis of compounds capable of interacting with multiple therapeutic targets. Specific substitutions in this structure are crucial for determining the activity profile of the compounds (4).

Aim

This study aims to review the literature on the anticancer effects of coumarin compounds. It seeks to understand their chemical structure, interaction with therapeutic targets, and potential in inhibiting tumor cells. The analysis aims to identify advances and challenges in using coumarins as a basis for new antitumor drugs, contributing to more effective and less toxic cancer treatment strategies.

Methods

This study employed a systematic review of the literature focused on the anticancer effects of coumarin compounds. National and international articles from the databases "CAPES Journal Portal," "SciELO," and "PUBMED" were analyzed. The descriptors used were “coumarins,” “coumarin compounds,” “anticancer effects,” and their equivalents in English and Spanish. Article selection involved analyzing titles, abstracts, methodologies, and results. Articles that did not specifically address coumarin compounds or did not present relevant data on their anticancer effects were excluded. The selected articles were categorized according to study type (in vitro, in vivo, clinical) and proposed mechanisms of action. Data on the chemical structure of coumarins, their modifications, molecular targets, signaling pathways, and experimental results were extracted. This approach allowed for a comprehensive analysis of the advances and challenges in utilizing coumarins as anticancer agents, contributing to identifying new research directions and drug development.

Results

The results obtained from this research demonstrate that coumarin derivatives containing 1,2-dichlorobenzene radicals, specifically compounds 106, 123A, and 123B, have a significant ability to reduce the viability of lung tumor cell lines H2170 and A549, as well as to inhibit cell migration in A549. Notably, compound 106 was particularly effective in inhibiting epithelial-mesenchymal transition (EMT) induced by IL-1β in A549 cells. These findings indicate that the three studied derivatives hold promising potential for the development of new chemotherapeutics that are more effective and exhibit lower toxicity towards the A549 cell line. However, further studies are crucial for a deeper understanding of the mechanisms of action involved and to ensure the safety of these compounds in the context of human health. Future research should include cell viability assays using the MTT method in normal cells, as well as genotoxicity tests, such as micronucleus assays, apoptosis, and alkaline comet assays, also in normal cells, to assess the cytotoxic and genotoxic effects of the derivatives. Additionally, conducting cell cycle assays and annexin V tests in A549 cells will be essential for exploring other metabolic pathways and determining whether the compounds induce cell death or merely inhibit the proliferation of A549 cells. Complementary studies should include immunohistochemical assays to evaluate e-cadherin and vimentin expression, as well as cell invasion tests, to further characterize the anti-metastatic effects of these compounds. Thus, the proposed set of assays will not only provide better elucidation of the mechanisms of action of coumarin derivatives but also contribute to the evaluation of their safety and efficacy as potential chemotherapeutic agents.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

Literature studies indicate that modifications in the chemical structure of certain substances can significantly affect their biological effects, enhancing them. For example (5), one study synthesized a series of scopoletin derivatives, a type of coumarin, by introducing α-aminoacetamide, acrylamide, and β-aminopropamide at position 3 of scopoletin. Through MTT assays, the cytotoxicity of these derivatives against four human tumor cell lines (MDA-MB-231, MCF-7, HepG2, and A549) was evaluated, and the compounds "7a," "7b," "7e," "7f," "8a," and "8e" demonstrated greater cytotoxicity than the original scopoletin. This study highlighted that the introduction of acrylamide and β-aminopropamide significantly increased cytotoxic activity. Many other studies corroborate the effectiveness of the MTT assay in evaluating cell viability. For example (5), another study used the MTT assay to evaluate a range of coumarin derivatives aiming to enhance their selective potency and growth inhibitory effect on tumor lines. It was found that six of these derivatives exhibited higher inhibitory potential than the chemotherapy control BENC-511 against A549 (human lung adenocarcinoma) (6). Another study synthesized aminocoumarin derivatives and, through the MTT assay, identified compound "17l" as having superior inhibitory activity in A549, with an IC50 value of 24 ± 0.1 nM, compared to the standard drug fluorouracil (IC50 of 11.13 ± 0.083 μM). The MTT assay was used to test a coumarin and phenylsulfonylfuroxan derivative, compound "8b" (7). This compound demonstrated dose- and time-dependent reduction in the viability of two human lung tumor lines (A549 and H1299), showing greater inhibition activity than the chemotherapy control cetaxel. Cisplatin, a widely used chemotherapeutic for various cancers including lung, ovarian, and testicular cancers, works by forming covalent bonds with DNA, resulting in the inhibition of DNA synthesis and induction of apoptosis. However, cisplatin can cause significant side effects such as myelosuppression, nausea, vomiting, nephrotoxicity, ototoxicity, neurotoxicity, hepatotoxicity, cardiotoxicity, and adverse ocular reactions. The mechanism of action of cisplatin involves chloride ion dissociation, forming a reactive complex with water that interacts with DNA, leading to the formation of intra- and interstrand cross-links and inhibition of DNA transcription. Additionally, cisplatin can bind to mitochondrial DNA, reducing ATP production and altering intracellular calcium content, resulting in the production of reactive oxygen species (ROS) and lipid peroxidation. Despite cisplatin's efficacy in cancer treatment, discovering new substances with antitumor effects is crucial for developing more effective chemotherapeutics with fewer side effects. The studies on coumarin derivatives previously mentioned represent promising advances in the search for new therapeutic agents that may offer better clinical outcomes with lower toxicity. Therefore, the results obtained with coumarin derivatives reinforce the need for ongoing research to explore their cytotoxic properties and mechanisms of action, aiming at developing more effective and safe therapies for lung cancer. Additional assays, such as genotoxicity tests, cell cycle evaluation, and immunohistochemistry studies, are essential for a more in-depth understanding of the effects of these compounds and to ensure their safety and efficacy as potential chemotherapeutics.

Keywords

Coumarin Compounds; Anticancer Effect; Cell Viability.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmacological Management of Candida Auris Infection in Children and Neonates

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About this scientific work

DOI: 10.62922/4cbffc.cp090
Link: https://doi.org/10.62922/4cbffc.cp090
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Candida auris was first identified in Japan in 2009, isolated from the ear secretion of a patient. Since then, infections caused by C. auris have become a global public health threat due to its rapid worldwide spread and resistance to multiple antifungal drugs. This emerging pathogen is particularly alarming due to its ability to persist in hospital environments, facilitating outbreaks that are difficult to control. Candidemia, an invasive bloodstream infection, is the most common manifestation of C. auris infections, with mortality rates ranging between 30% and 60% (1,2). Additionally, C. auris can cause other severe infections, such as urinary tract infections, wounds, and otitis, making its resistance to treatment options a critical challenge for healthcare professionals. In pediatric patients, the immaturity of the immune system often increases susceptibility to infectious diseases. This group is particularly vulnerable in hospital settings, where the need for mechanical ventilation, sedation, use of catheters,

recurrent aspiration, prolonged hospitalization, and the presence of comorbidities are known risk factors for developing infections (3,4). Although the incidence rate of fungal infections in neonates and children is relatively lower compared to adults, these infections represent an alarming reality due to the high morbidity and mortality associated with them and the limited treatment options available. Furthermore, early detection and accurate diagnosis of these infections can be challenging, often delaying the initiation of appropriate treatment and worsening the prognosis (3,4).

Aim

To conduct an exploratory literature review on the pharmacotherapeutic management and resistance profile associated with Candida auris infections in pediatric patients.

Methods

This is an observational and descriptive study with a qualitative approach in the form of a literature review. The selection of scientific articles for this review was conducted using the following electronic databases: National Library of Medicine (PubMed), BVS Brazil (Virtual Health Library - Brazil), and SciELO (Scientific Electronic Library Online). The search involved combining the descriptors “Candida auris” with “pediatrics,” “children,” and “neonatal,” using the Boolean operator AND. Inclusion criteria were articles in any language that focused on the pediatric age group or had relevant correlations, published in the last five years (2020 to 2024). Exclusion criteria included works that did not meet the research objective, literature reviews, pre-prints, and those not fitting the other inclusion criteria.

Results

A retrospective study conducted in 2021 followed 34 children with candidemia caused by C. auris, of whom 65% were male and 47% were aged between 29 and 365 days. In this study, 97% received specific antifungal treatment for bloodstream infection by C. auris. Among these, 47% received amphotericin B deoxycholate, 29% received azole antifungals, and 21% received caspofungin. Antifungal susceptibility testing was performed on 13 isolates. Of these, 54% were resistant to amphotericin B, 15% were resistant to fluconazole, and 8% were resistant to both anidulafungin and amphotericin B but susceptible to caspofungin and micafungin (5). Another study conducted in 2020 evaluated antifungal therapy in patients, with a total of 23 samples from a tertiary hospital in Oman, all with C. auris fungemia. Of the 23 patients with C. auris fungemia, 2 were pediatric patients. All isolated samples were resistant to fluconazole, confirming the yeast's resistance to azoles, but were sensitive to echinocandins, which were used as first-line therapy (8). as micafungin clearance adjusted for body weight is higher in neonates compared to older children and adults, infants require higher doses of micafungin based on body weight (6). A clinical study involving 35 neonates and young infants colonized by Candida sp. assessed the efficacy and safety of micafungin in this population. A transient increase in transaminases was observed in 20% of the patients. Micafungin at a dose of 8 mg/kg per day was effective and well tolerated. Treatment success with micafungin was achieved in 61.9% of patients, regardless of treatment duration, and in patients who completed a minimum of 14 days of micafungin therapy, the success rate was 86.7% (6).

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

Amphotericin B is widely used in critically ill patients due to its broad spectrum of action; however, the resistance profile described in the study and the delayed growth of microbiological cultures can prevent patients from accessing effective pharmacotherapy. In clinical practice, patients with evident signs and symptoms of fungal infection typically begin empirical therapy, which will be optimized based on the results of sensitivity tests. often, treatment starts with fluconazole, but it is quickly escalated to micafungin or amphotericin B in cases of clinical instability, severe thrombocytopenia, or abdominal surgeries. Treatment for Candida infections usually involves azole antifungals, which work by inhibiting lanosterol 14α-demethylase, thereby blocking the biosynthesis of ergosterol, an essential component of the fungal membrane and cellular integrity. Azole resistance is commonly associated with the indiscriminate use of antimicrobials but can also result from intrinsic factors such as alterations or mutations in genes like ERG11 and ERG3, which code for proteins involved in ergosterol biosynthesis. Mutations in these genes can critically impact the efficacy of azole antifungals (7,8). Although many studies have shown the sensitivity of C. auris to echinocandins such as anidulafungin, caspofungin, and micafungin, these therapeutic options may become insufficient in the future, given the rising resistance to this class of medications, which will further limit the therapeutic arsenal (9,10,11). C. auris is a globally relevant pathogen with a significant impact on public health. Treating candidemia caused by C. auris presents challenges due to increasing resistance to available antifungals. It is crucial to prioritize controlling nosocomial infections and intra-hospital outbreaks. The indiscriminate use of antimicrobials contributes to the rise of Candida infections, especially in pediatric patients. Therefore, preventing and controlling nosocomial infections in pediatric populations requires strict hygiene measures, constant monitoring, and specialized protocols to minimize exposure to risk factors. The role of the pharmacist in the clinical management of antimicrobial therapy for hospitalized patients is highlighted, focusing on safe pharmacotherapy, reducing adverse reactions, and achieving better therapeutic outcomes. In the pediatric population, there is a particular emphasis on reducing the toxicity of antimicrobials.

Keywords

Candida Auris; Pediatrics; Child; Neonate.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Antitumor Activity of the Anthraquinone Chrysazine (1,8-Dihydroxyanthraquinone): a Review

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About this scientific work

DOI: 10.62922/4cbffc.cp091
Link: https://doi.org/10.62922/4cbffc.cp091
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Chrysazin (1,8-dihydroxyanthraquinone), also known as danthrone, is a naturally occurring anthraquinone widely found in the roots and rhizomes of Rheum palmatum L. (Polygonaceae) (1). Recent studies have indicated several biological activities of chrysazin, such as antibacterial activity against Staphylococcus aureus (2); antifungal activity, by inhibiting the formation of Candida albicans biofilms (3); reduction of atherosclerotic plaques (4); and reduction of neurotoxicity caused by β-amyloid protein (5). Chrysazin was widely used as a laxative agent since the beginning of the last century, but the Food and Drug Administration (FDA) ordered its withdrawal from the market due to its possible carcinogenicity to humans. Since then, the antitumor properties of this anthraquinone have been investigated (6).

Aim

The purpose of this review was to analyze the evidence available in the literature regarding the antitumor activity of chrysazin on different types of cancer.

Methods

The search for scientific articles was conducted in the PubMed database (National Library of Medicine) using descriptors such as “danthron” and “antineoplastic agents” determined by MeSH (Medical Subject Headings). Exclusion criteria included the nature of the articles (review), text availability (incomplete texts), and irrelevant titles.

Results

Recent studies indicate the potential antitumor, antiproliferative, and antimetastatic actions of chrysazin, such as in human brain glioblastoma (GBM8401 cells) (1, 7, 8), human gastric cancer (SNU-1 cells) (9), human pancreatic cancer (Panc-1 and Mia PaCa-2 cells) (10), murine melanoma (B16-F10 cells) (11), and rat glioma (C6 cells) (12). Furthermore, chrysazin also inhibited angiogenesis, a process fundamental for tumor growth and metastasis (13), and increased sensitivity to doxorubicin in human pancreatic cancer cells (10).

Discussion

Among the mechanisms related to the antitumor potential of chrysazin, the increase in intracellular production of reactive oxygen species (ROS) and apoptosis stands out. This occurs because chrysazin, like other anthraquinones, is metabolized through reduction reactions catalyzed by different flavoenzymes that use NADH and/or NADPH as electron sources. The one-electron reduction generates the semiquinone radical, while the two-electrons reduction produces hydroquinone, which can undergo autoxidation and also form the semiquinone radical. In turn, the unstable semiquinone radical transfers an electron to molecular oxygen and returns to the original anthraquinone, generating the superoxide radical and other ROS, leading to oxidative stress (14). ROS are key second messengers in regulating various cellular signaling pathways, including those that regulate the mitochondrial (intrinsic) pathway of apoptosis (15).

Keywords

Danthron; Antineoplastic Agents; Apoptosis.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Molecular Mechanisms Related to the Antitumor Activity of the Anthraquinone Quinalizarin: a Systematic Review

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About this scientific work

DOI: 10.62922/4cbffc.cp092
Link: https://doi.org/10.62922/4cbffc.cp092
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Anthraquinones are quinones derived from the tricyclic aromatic system of anthracene (9,10-anthracenedione), being secondary metabolites synthesized by plants, fungi and insects (1). Quinalizarin (1,2,5,8-tetrahydroxyanthraquinone) is a naturally occurring anthraquinone extracted mainly from the roots of plants of the Rubiaceae family (2). In 2009, quinalizarin was identified as a potent and selective inhibitor of protein kinase CK2, a serine/threonine protein kinase with several substrates involved in cellular processes such as gene expression, protein synthesis, differentiation, proliferation, and apoptosis (3). In addition, quinalizarin exhibits antiviral activities against human cytomegalovirus (4); antibacterial activities against Staphylococcus aureus MSSA biofilms (5); antifungal activities against Candida albicans biofilms (6) and against yeasts common in cancer patients, such as Candida species and Geotrichum capitatum (2); adipogenesis inhibition (7); and inhibition of enzymes like α-amylase from Aspergillus oryzae and bovine hyaluronidase (8).). More recent studies have highlighted the antitumor potential of quinalizarin due to its ability to inhibit cellular proliferation and induce apoptosis in various cancer cell lines (9).

Aim

The purpose of this systematic review was to investigate the molecular mechanisms responsible for quinalizarin's ability to inhibit cell proliferation and induce apoptosis in various cancer cell lines.

Methods

The search for scientific articles was conducted in the PubMed database (National Library of Medicine) using the descriptors “quinalizarin” and “apoptosis” as determined by MeSH (Medical Subject Headings). The exclusion criteria included the nature of the article (literature review) and irrelevant titles. Using the advanced search tool and Boolean operators “OR” and “AND,” 18 scientific articles were identified, and after applying the exclusion criteria, 6 studies were selected for inclusion in this systematic review. The variables analyzed were apoptosis-inducing capacity, determination of pro- and anti-apoptotic proteins, signaling pathways, cell cycle analysis, and measurement of reactive oxygen species (ROS).

Results

The selected studies investigated the ability of quinalizarin to inhibit cell proliferation and/or induce apoptosis in different types of cancer cells, as well as the related molecular mechanisms. Human cancer cell lines used included esophageal (HCE-4) (9), gastric (AGS) (10), colorectal (SW480) (11), melanoma (A375) (12), lung (A549) (13), and estrogen-dependent breast (MCF-7) (14). Flow cytometry analyses showed that quinalizarin significantly induced apoptosis in all human cancer cell types. Western blot (WB) assays demonstrated a significant increase in the expression of pro-apoptotic proteins (Bad, caspase-3, and PARP) and a decrease in the expression of anti-apoptotic proteins (Bcl-2) following quinalizarin treatment. Regarding signaling pathways, quinalizarin was able to regulate the mitogen-activated protein kinase (MAPK) pathways and the signal transducers and activators of transcription (STAT3) pathways in all cell types, increasing the expression of p38 and JNK while decreasing the expression of ERK and STAT3. Furthermore, in breast and esophageal cancer cells, there was a reduction in the expression of nuclear factor kappa B (NF-κB), whereas in colorectal and gastric cancer cells, there was also a reduction in Akt. The studies showed that the MAPK pathway can also regulate the STAT3 pathway, as the reductions in STAT3 induced by quinalizarin were reversed when tumor cells were treated with p38 and JNK inhibitors. WB assays of cell cycle regulatory proteins, such as CDK1/2 and cyclins a and B (G2/M phase) and CDK2/4 and cyclin D1/E (G0/G1 phase), revealed that quinalizarin caused cell cycle arrest in the G0/G1 phase (esophageal and lung cancers) and the G2/M phase (breast cancer and melanoma). Finally, in all cell types, quinalizarin increased intracellular ROS production, which was confirmed by pre-incubation of tumor cells with N-acetyl-L-cysteine (NAC), as NAC prevented excessive ROS production and reversed quinalizarin-induced apoptosis.

Discussion

Quinalizarin, being an anthraquinone, is metabolized through one- or two-electron reduction reactions, which are catalyzed by various flavoenzymes that use NADH and/or NADPH as electron sources. One-

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

electron reduction generates the semiquinone radical, while two-electron reduction produces hydroquinone, which can undergo autoxidation and form the semiquinone radical. The unstable semiquinone radical transfers an electron to molecular oxygen and returns to the original anthraquinone, generating the superoxide radical and other ROS, leading to oxidative stress (15). ROS are crucial second messengers in the regulation of several cellular signaling pathways, including those that regulate the mitochondrial (intrinsic) pathway of apoptosis, such as MAPK p38 and JNK. The MAPK pathway includes JNK and p38, which are activated by stress stimuli (such as ROS), and ERK, which is mainly activated by growth factors. JNK and p38 are responsible for various cellular processes, including apoptosis, through the regulation of pro-apoptotic proteins (such as Bax and Bad) and anti-apoptotic proteins (such as Bcl-2) (14). Furthermore, as demonstrated in studies, the MAPK pathway also regulates STAT3, which is essential for metastasis processes such as survival, proliferation, migration, invasion, and angiogenesis (12). For this reason, the MAPK signaling pathway, together with STAT3 and the transcription factor NF-κB, are major molecular targets of chemotherapeutics used in the treatment of different types of cancer (14).

Keywords

Quinalizarin; Apoptosis; Reactive Oxygen Species.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Indole B-Carboline Alkaloids and Their Perspectives in Pharmacotherapy

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About this scientific work

DOI: 10.62922/4cbffc.cp093
Link: https://doi.org/10.62922/4cbffc.cp093
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

β-carbolines possess a 9H-pyrido[3,4-b]indole skeleton and belong to the second largest group of indole alkaloids, featuring a fully unsaturated pyridine ring. The partially and fully saturated derivatives are known as dihydro-β-carbolines and tetrahydro-β-carbolines, respectively (1). β-carbolines were first described in Peganum harmala. However, two of these alkaloids, harmine and harmaline, were also isolated from a hallucinogenic beverage with religious significance, typical of the Amazon region, known as Ayahuasca. These substances inhibit monoamine oxidase (MAO) and act synergistically to produce hallucinogenic effects (2). Studies have shown that harmane, norharmane, and harmine can intercalate between DNA bases, significantly contributing to antitumor activity (3).

Aim

This study aims to conduct a systematic review of the pharmacotherapeutic potential of β-carboline alkaloids for various clinical conditions.

Methods

A search was conducted from January 1973 to July 2024 in the following databases: PubMed, Science Direct, Web of Science, Scopus, the American Chemical Society, and Google Scholar. The keywords "β-carboline alkaloids" were combined with terms related to biological and pharmacological activities and effects, with no language restrictions. Articles were evaluated based on relevant information, sources, concentrations or doses, administration routes, test systems, and possible mechanisms of action. Inclusion criteria comprised in vitro, in vivo, or ex vivo assays involving experimental animals, humans, tissues, and cells, as well as studies with isolated β-carbolines and their derivatives or preparations. Exclusion criteria were studies addressing alkaloids outside the β-carboline group, extracts without phytochemical analysis, and isolated β-carboline alkaloids without screening their biological activities.

Results

A total of 2,720 articles were found in the databases. Fifty-nine of these met the inclusion criteria after reviewing titles, abstracts, and removing duplicates. The general findings on the biological activities of β-carboline alkaloids demonstrated their potential antibacterial (4), antitumor (5), anti-inflammatory (6), antioxidant (7), antiviral, primarily against influenza (8), hypoglycemic (9), antiparkinsonian (10), and promising effects for Alzheimer's disease (11). Additionally, β-carboline derivatives showed cytotoxic activity against various tumor cells (12).

Discussion

Regarding antioxidant activity, aromatic β-carbolines like norharmane, harmane, and tetrahydro-β-carbolines effectively eliminate hydroxyl radicals in Fenton reaction systems (7). Furthermore, β-carbolines can react with hydroxyl radicals, forming hydroxy-β-carbolines, while tetrahydro-β-carbolines produce oxidative and degradation compounds (7). Harmine and harmol exhibit significant antidiabetic activities by preventing the formation of amyloid fibrils from human islet polypeptide associated with type 2 diabetes mellitus (9). β-carboline derivatives also act as selective antagonists of the somatostatin subtype 3 receptor (SSTR3), making them useful in treating type 2 diabetes and related conditions such as hyperglycemia, insulin resistance, obesity, lipid disorders, and hypertension, as well as depression and anxiety (13,14). In the context of antiviral activity, β-carbolines like harmalol, harmane, and harmaline show potent anti-influenza effects against different strains, including H1N1 and H5N1, by interfering with viral replication and adsorption (8). Analogues 1-(4-hydroxyphenyl)-3-carboxamide(ethylamine)-β-carboline and 1-(4-methoxyphenyl)-3-carboxamide(ethylamine)-β-carboline exhibit antibacterial properties against Mycobacterium tuberculosis (15). A series of β-carboline dimers and their N2-alkylated analogues exert potent activity against Staphylococcus aureus, with MICs of 0.01-0.05 µmol/mL, highlighting that N1-N1 dimerization and N2 benzylation significantly enhance the antimicrobial effects of these compounds (16). Antiparkinsonian activity is associated with both β-carbolines and their N2-alkylated derivatives, whose mechanism is related to the interaction with dopamine receptors, and the inhibition of monoamine oxidases a and B, which reduces the production of reactive oxygen species (10). These substances also modulate the inflammatory cascade by inhibiting microglial proliferation, decreasing inflammatory cytokines, and creating an anti-inflammatory

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

environment in the central nervous system (10). Finally, the antitumor activity is associated with multiple mechanisms, such as DNA intercalation, inhibition of topoisomerase I and II enzymes, cyclin-dependent kinases, mitogen-activated protein kinase (MAPKAP-K2), mevalonate kinase (MK-2), and kinesin protein (5). β-carbolines exhibit a wide range of promising biological activities, including antioxidant, antidiabetic, antiviral, antibacterial, antiparkinsonian, and antitumor effects. They eliminate hydroxyl radicals, inhibit amyloid fibril formation, combat influenza strains and bacteria like Mycobacterium tuberculosis and Staphylococcus aureus. In Parkinson's treatment, they modulate inflammation and interact with dopamine receptors. The antitumor activity involves DNA intercalation and enzyme and protein inhibition critical for cell survival. These therapeutic effects make β-carbolines promising candidates for developing new drugs in various health areas.

Keywords

Alkaloids; B-Carbolines; Plant-Derived; Pharmacological Effects.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmacotherapy of Depressive Disorder with the Use of Phytotherapy Medicines in Adult Patients: Literature Review

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About this scientific work

DOI: 10.62922/4cbffc.cp094
Link: https://doi.org/10.62922/4cbffc.cp094
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Depression is a mental health disorder, and it is currently recognized as the second-leading cause of disability worldwide (1). This disease presents with persistent sadness, loss of interest and impaired cognition, mood disturbances, which significantly affects the ability to function and have a satisfying social, family and professional life (2). Herbal antidepressants have been used and there has been great advances in the understanding of the ability of these herbs to improve cognitive deficit (3). A wide variety of herbal medications thought to have antidepressant-like effects have been reported in ancient pharmacopoeias (4).

Aim

Evaluate the use of medicinal plants in the treatment of patients with depressive disorder, helping the pharmacist in the management of depression.

Methods

This is a review study, prepared from searches in the PubMed database, using the health descriptors (DeCs and MeSH): “phytotherapy”, “medicinal plants”, “treatment”, “depressive disorder”. The

following inclusion criteria were adopted: intervention studies carried out in the last five years, complete and that addressed the theme proposed for the review.

Results

The antidepressant activity of active compounds in plants has been confirmed in pre-clinical and clinical studies, being observed, for example, in St. John's wort, saffron, lemon balm, lavender, ginkgo, Korean ginseng, borage, brahmi, mimosa tree and magnolia bark (2). The mechanisms of action are similar to those found in synthetic antidepressants, such as increased levels of monoamine neurotransmitters, inhibition of hyperactivity of the hypothalamic-pituitary-adrenal axis, regulation of hippocampal neurons and neurotrophic factors, neutralization of excitatory amino acid toxicity, regulation of immune cytokines and the function of the microbe-gut-brain axis (1,2). Furthermore, considering the hypothesis that CNS immune disorders are a significant pathogenic factor of depression, the anti-inflammatory effect is also important for the antidepressant activity of plants (2). Antidepressant activity has been demonstrated for several polyphenols, including berberine, piperine, curcumin and naringenin (5,6). A study with M. chamomilla L. found, in addition to its anxiolytic activity, clinically significant antidepressant effects and another study reported that the use of St. John's Wort reduced the number of depressive patients with fewer risks and side effects than conventional medications (7,8). However, it is important to draw the health team's attention to potential risks, for example, with Hypericum which can precipitate psychosis (7).

Discussion

As the pharmacotherapy of depressive disorders constitutes a long-term process associated with the risk of various adverse drug effects, pharmaceutical care for patients using alternative therapy methods, including phytopharmacotherapy, is very important, especially in the treatment of mild or moderate depression.

Keywords

Phytotherapy; Medicinal Plants;Treatment; Depressive Disorder.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Spironolactone as an Alternative Therapy for Moderate to Severe Acne in Adult Women

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About this scientific work

DOI: 10.62922/4cbffc.cp095
Link: https://doi.org/10.62922/4cbffc.cp095
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 30/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Acne vulgaris is a common inflammatory dermatological disease that commonly affects adolescents and adults, and is characterized by the presence of papules, comedones, and/or pustules on the skin. Its diagnosis is clinical, and its treatment depends on the severity, and may involve topical and oral medications (1,2). In recent years, adult female acne (AFA) has drawn attention due to its impact on self-esteem, since patients experience discomfort from the lesions and, subsequently, from the formation of scars. Spironolactone is a potassium-sparing diuretic that has been studied for dermatological use as a

possible treatment of pathologies such as acne, female androgenetic alopecia, and hidradenitis suppurativa due to its anti-androgenic effects (2,3). Therefore, the use of spironolactone as part of the treatment could bring benefits, especially when compared to current therapies that mostly rely on antibiotics and other medications that require monitoring, such as isotretinoin.

Aim

Point out evidence that suggests the effectiveness of using spironolactone in the treatment of acne in adult women.

Methods

This is a literature review. The analysis sought articles in the PubMed, Scielo and Google Scholar databases. The Medical Subject Headings (Mesh) descriptors “acne vulgaris”, “spironolactone” and “treatment” were used. as inclusion criteria, articles and clinical trials published in Portuguese, English, and Spanish between 2017 and 2024 were chosen.

Results

The search for studies that investigated the use of spironolactone in the treatment of acne resulted in 15 articles being identified. Of these 15, only 5 were used for a more profound analysis. Spironolactone is a mineralocorticoid receptor antagonist and is indicated for the treatment of primary hyperaldosteronism, congestive heart failure, cirrhosis, nephrotic syndrome, essential hypertension, hypokalemia, and edema during pregnancy (6). Anti-androgens act by reducing the production of sebum induced by androgen hormones, inhibiting the action of sebaceous glands, and reducing the production of ovarian and adrenal androgen (4). In the case of spironolactone, its anti-androgenic effect comes from competition with testosterone and dihydrotestosterone for binding to androgen receptors. In the presence of high testosterone concentrations, it behaves as a pure antagonist. It also acts by degrading a cytochrome P450 cofactor that is involved in testosterone synthesis at gonadal and adrenal levels, in addition to increasing levels of sex hormone-binding globulin, thus reducing testosterone levels (3). Studies show that patients should start with low doses of the medication and, depending on the response and tolerability of the treatment, gradually increase the doses. Standard doses have been established from 25 to 50 mg/day, potentially reaching up to 100 mg/day, although there is still no consensus on dosage recommendations by body weight (3,5).

Discussion

The results obtained from the analyzed studies provide evidence of the therapeutic potential of spironolactone in the treatment of acne, however it is still something that needs to be studied in more depth, due to the lack of solid results. Its ability to reduce the production of sebum and testosterone brings a great perspective to patients. Regarding side effects, little is known yet, but spironolactone is generally safe and well-tolerated, but there are reported cases of headache, menstrual irregularities, nausea, dizziness, diuresis, hypotension, dysentery, breast tenderness, and fatigue, which may lead to treatment discontinuation (2,3,5). Furthermore, it is important to point out that spironolactone is a

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

potassium-sparing diuretic, predispositioning to hyperkalemia, hyponatremia, and hypotension, especially in patients with renal or heart failure if high doses are used. Therefore, it is recommended to carry out a laboratory evaluation before starting treatment, in order to check electrolyte levels and avoid these problems. For young and healthy patients, monitoring does not need to be continuous; however, for women over 45 years or with comorbidities, the practice is relevant and must be done continuously (2,3,5). The use of spironolactone can be an alternative to the use of systemic antibiotics, such as tetracyclines, which are still used as first-line treatments. This replacement can bring benefits to patients, since the increase in microbial resistance to antibiotics is a reality nowadays in clinical practice. These results highlight spironolactone as a promising approach for treating acne in adult women, bringing hope to patients and opening new perspectives for further research. Therefore, the reviewed studies provide a solid basis for advancing studies into new strategies for treating AFA, which have the potential to revolutionize dermatology.

Keywords

Spironolactone; Treatment; Acne Vulgaris.

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Profile of Potential Drug Interactions in Elderly Hospitalized Patients

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About this scientific work

DOI: 10.62922/4cbffc.cp096
Link: https://doi.org/10.62922/4cbffc.cp096
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 29/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The aging process represents the primary factor in the propensity for the emergence of chronic diseases, which are related to the decrease in the activity of various organs. This allows the use of multiple medications, which may be Potentially Inappropriate for the Elderly (MIPs), whether due to drug interactions or the specific characteristics of changes in the absorption, distribution, metabolism and action of medications in the body of the elderly (1). The prevalence of interactions increases exponentially with the number of drugs prescribed, mainly associated with the complexity of the clinical features in hospitalized patients. Conditions intrinsic to the patient, such as age, sex and health conditions; and factors intrinsic to the medicine, mainly the therapeutic index. The presence of one or more drug interaction risk factors increases the complexity of a prescription (2).

Aim

Therefore, this work aimed to identify the most prevalent Potential Drug Interactions (PIMs) among hospitalized elderly hospitalized patients.

Methods

This is a descriptive, cross-sectional and retrospective study, with a quantitative approach. Approved in accordance with the rules of CNS resolution no. 466/2012, with opinion number 4.951.726. The study was carried out based on the analysis of prescriptions from elderly hospitalized patients in Barros Barreto Hospital, Belém-PA from March to May 2023. The UpToDate® platform was used as a clinical decision support tool.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

During the study period, 70 patients were admitted. In terms of age, the average was 70.8 ±7.3, with a minimum of 60 years and a maximum of 97 years. Regarding comorbidity, 72.86% (n=51) of patients have at least one type of comorbidity and 27.14% (n=19) do not have or have not been diagnosed, the most prevalent are: arterial hypertension (n= 29), diabetes (n=26) and others (n=8). The average length of hospital stay corresponded to 19.23 ±10.8 days, with a minimum length of 1 day and a maximum of 44 days. 70 medical prescriptions were evaluated, resulting in a total of 684 medications and an average of 9.7 ± 3.8 medications per prescription. In total, 64.29% (45) prescriptions had at least one PIM. as a result, 82 PIMs were identified with risk classification n=6) risk in relation to risk classification D, Dipyrone and Enoxaparin are the most involved, in risk classification X, Bromopride is the medication that was present in 83.33% (n=5) of cases.

Discussion

In the analysis of elderly people with comorbidity, we identified that 72.86% of patients had at least one type of comorbidity. This result is similar to that found by Rocha (3), who observed that 81.15% of hospitalized elderly people had some type of comorbidity. The clinical profile evidenced in the studies, with a high proportion of elderly people suffering from chronic non-communicable diseases, is explained by the nature of aging itself, which constitutes a risk factor. The admission diagnosis indicated a variety of conditions, with emphasis on conditions of the digestive system (31.43%) and skin and appendages (21.43%). Regarding the average number of medications prescribed, we identified 9.7, ±3.8 medications per prescription. The high average number of medications prescribed per patient, as identified in the study, is a common practice among hospitalized elderly people. This can be justified by the presence of comorbidities, which, in turn, results in polypharmacy and can contribute to the increase in PIMs and adverse reactions. This study also found that 64.29% of prescriptions had at least one PIM, with moderate risk prescriptions corresponding to 92.68% of the total interactions analyzed. According to the

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

study by Tiguman (4), which identified PIMs in prescriptions for elderly patients, they were observed in 74% of prescriptions. These results point to a warning in relation to elderly patients, since physiological changes resulting from aging can influence the pharmacokinetics of most medications. The PIMs between Bromopride and Amitriptyline, classified as severe, can generate extrapyramidal reactions and neuroleptic malignant syndrome, this occurs because both medications act on the same dopaminergic receptors. Bromopride is often used to treat gastrointestinal disorders, reflux, nausea and vomiting. This PIM was also reported in a study that created a guide on contraindicated drug interactions prepared by Ferreira (5). In conclusion, the analysis of prescriptions revealed that 64.29% of prescriptions for hospitalized elderly people presented at least one PIM, with 92.68% classified as moderate risk. The main medications involved were Dipirone, Enoxaparin and Tramadol. It should be noted that a PIM can compromise the effectiveness and safety of the patient, prolong the period of hospitalization, increase hospital costs and, above all, compromise the quality of life of elderly patients. Therefore, pharmaceutical monitoring is essential in prevention and monitoring of therapy.

Keywords

Drug Interactions; Pharmaceutical Care; Patients.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Use of off-Label Medications in Children: Evaluation of Benefits, Risks, and Impacts on Child Health

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About this scientific work

DOI: 10.62922/4cbffc.cp097
Link: https://doi.org/10.62922/4cbffc.cp097
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 28/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The use of off-label medications in children is a complex and controversial practice in pediatric medicine (1), involving the prescription of drugs for purposes not approved by regulatory agencies (1-2). This scenario is often driven by the lack of therapeutically approved options specifically for children (3), due to ethical and practical challenges associated with conducting pediatric clinical trials. Although it may offer an alternative in challenging clinical situations (3-4), off-label use also raises significant concerns about the safety and efficacy of these treatments, especially considering the physiological and

metabolic differences between children and adults (4). This practice occurs when medications are prescribed for children in ways not approved by regulatory authorities, whether by indication, dose, age group, or method of administration differing from approved recommendations (1-3). The lack of adequate studies in pediatric populations results in a significant gap in data regarding the safety and efficacy of these treatments in children, which heightens concerns about potential risks (5-6). This study aimed to answer the following research question: What are the risks, impacts, and benefits of off-label medication use reported in efficacy studies in children?

Aim

Aims to comprehensively review the scientific literature on the potential benefits, associated risks, and impacts on child health resulting from the use of off-label medications in children

Methods

To achieve the proposed objectives, a comprehensive narrative review of the scientific literature was conducted using electronic databases such as PubMed, Scopus, and Web of Science. The search terms included combinations of Medical Subject Headings (MeSH): 'off-label use', 'children', 'pediatric', 'benefits', 'risks', 'safety'. Studies published in the last ten years addressing the use of off-label medications in children were included. Randomized controlled trials or quasi-experimental trials of the crossover, stepped wedge, and interrupted time series types that address the use of off-label medications in children were reviewed, as well as observational studies with the same research objective. Data on efficacy and safety were considered, along with comparative analyses with alternative treatments when available. Studies not available in full text or those not addressing the research question will be excluded. References will be selected through the application of search strategies exported to the Rayyan Qatar Computing Research Institute software (Rayyan QCRI - https://rayyan.qcri.org), as this tool will facilitate the identification of duplicates, and the screening of titles, abstracts, and full texts. Two reviewers, duly qualified for the application of this review protocol, will independently analyze the duplicates, which will then be compared to confirm the appropriate exclusion of studies that do not meet the eligibility criteria."

Results

After analyzing titles and abstracts and removing duplicates, 5 studies that met the eligibility criteria were included. These five studies address the benefits, risks, safety, and efficacy of off-label medication use in children. off-label use is quite common among children, with significant variations according to age group, being more frequent in younger children, particularly in neonates and infants (1). The safety and efficacy of off-label medications in children varied widely, with some showing significant efficacy (3), while others presented considerable risks (2,4). The reviewed studies indicated a lack of data on safety and efficacy, which is a persistent concern (1,2), and this finding corroborates with other studies showing that efficacy was less clear due to the absence of specific studies (1-3). Overall, the findings suggest that conducting clinical trials in children is complex and requires approaches tailored to the needs and characteristics of this population (3-4), and that recommendations include collaboration with

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

pediatric specialists and the inclusion of rigorous safety measures to protect participants (4). Despite being a common and necessary practice in neonatal intensive care, it raises questions about the safety and efficacy of therapies (5). Implementing stricter protocols and conducting additional studies are essential to improve the safety of off-label treatments in neonatology (4-5). Overall, the results indicate that off-label use can offer valuable therapeutic alternatives in situations where approved treatments are unavailable or inadequate for children with specific medical conditions (5-6). However, the risks of serious adverse effects are significant due to physiological and metabolic differences between children and adults, as well as the lack of robust safety data in many cases (6). The analysis of the reviewed studies revealed specific situations in children where off-label medication use may be considered (1-7)

Discussion

The studies address the urgent need for more research in the pediatric field to fill knowledge gaps regarding the efficacy and safety of medications in children (2,5-6). It is crucial to balance potential benefits with known and unknown risks when considering off-label use (1), with careful supervision by experienced healthcare professionals (2,3). Implementing strategies for monitoring and reporting adverse events is also essential to protect child health (6). Ultimately, evidence-based policies and practices are crucial to ensure that children receive safe and effective treatments (4-5), thus promoting better long-term health outcomes. Although it may represent a valuable option in certain clinical scenarios, it can still pose risks to pediatric patient safety (6), making it important to develop clear guidelines for the prescribing and monitoring of these medications (4). Effective strategies should include promoting further pediatric research to address knowledge gaps (3) and establishing robust surveillance systems to detect and report adverse events (6). Additionally, public health policies should be reviewed to ensure that clinical decisions are based on best practices and the best interests of children's health, ensuring safer and more effective care.

Keywords

Children; Safety; off-Label Use; Pharmacotherapy.

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DOI: 10.62922/4cbffc
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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Proteasome Inhibitors in the Treatment of Rheumatoid Arthritis: a Literature Review

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About this scientific work

DOI: 10.62922/4cbffc.cp098
Link: https://doi.org/10.62922/4cbffc.cp098
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 27/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Rheumatoid arthritis (RA) is a chronic, progressive autoimmune disease characterized by high proliferation of macrophages, fibroblasts, and pro-inflammatory cytokines in the synovial membrane, promoting the destruction of bone tissue. The development of this inflammatory state promotes the erosion of bone tissue, with a progressive increase in cartilage destruction and bone deformations. RA treatment is based on non-pharmacological and pharmacological measures. Pharmacological interventions are focused on disease-modifying medications capable of preventing the progression of

structural and functional damage (1). Proteasomes are protein complexes responsible for the elimination and recycling of proteins and peptides, and their inhibitors are a pharmacological class that blocks that activity (2). Intracellular proteins are degraded by the ubiquitin-proteasome system (UPS), including important proteins in the processes of inflammation, growth, and proliferation. Thus, the immunoproteasome plays a pivotal role in RA progression, especially related to the NFkB pathway, as it is responsible for the degradation of IkB, an inhibitor of the NFkB pathway, leading to this pathway activation. This pathway induces the expression of many proinflammatory cytokines, such as TNF-α, IL-1 and IL-6, which are increased in RA (3, 4). In RA, the constant status of inflammation demands an intense elimination of proteins by UPS, especially those related to proinflammatory activities. UPS also promotes the proliferation and survival of synovial fibroblasts, creating an inflammatory environment that promotes bone and cartilage destruction (4). Therefore, blocking proteasome activation may reduce RA inflammation, damage, and cell proliferation.

Aim

Find evidence in the literature about proteasome inhibitors' effects on rheumatoid arthritis.

Methods

A literature review was conducted by applying the Decs/Mesh-based descriptors and their respective boolean operators: "Proteasome inhibition" OR "Proteasome inhibitors" AND "Rheumatoid Arthritis" AND "Treatment", in the Biblioteca Virtual em Saúde (BVS), PubMed and Periódicos CAPES databases. In this review, only studies published in the last 20 years in English, Spanish, or Portuguese were included, while repeated studies and literature reviews were excluded.

Results

of the 26 works found, 8 were included. The studies applied well-established and new drugs with immunomodulatory action mechanisms. Most of these drugs, such as Bortezomib, MG132 and VR23, reduced proinflammatory cytokine liberation through the NFkB signaling pathway, especially TNF-α, IL-1β, IL-6 and IL-10 (5, 6, 7). The LMP7 (β5i) subunit inhibitor PR-957 cytokine inhibition was related to T-cell differentiation regulation, as it was also able to reduce Th1 and Th17 T-cell differentiation while increasing Th2 and Treg cells (8, 9). It also lowered collagen oligomeric matrix protein (COMP) deposition levels, which corresponded with the inhibition of bone erosion and joint inflammation (9). High concentrations of PR957 were also able to inhibit other UPS subunits, LMP2 and MECL-1, slightly increasing its effects (9). Immunomodulator Abatacept showed inhibitory action in the B1i subunit, more expressed over long periods (10). P121, a Pgp efflux transporter inhibitor, reduced UPS cross-resistance to some anti-β5i subunit drugs, such as carfilzomib, which was induced by PSMB5 gene-mediated Pgp efflux transporter production (11). In the long term, Bortezomib inhibited the activation and triggered apoptosis of CD4+/CD8+ T cells, with a decrease in CD25 expression in a concentration-dependent manner (5). MG132 had an effect on neuropathic pain control associated with the reduction of neuropeptides through the NFkB pathway, such as substance P (SP) and dynorphins, and the reduction of NFkB p50 homodimer complex formation, a structure that regulates cytokine production and anti-

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

inflammatory gene repression (6). The association with inhibitors of other subunits, such as LMP2 and/or MECL-1, increased the potency of inhibition (12). Zetomipzomib inhibited fully LMP7 and partially LMP2 subunits and achieved good results in inflammation reduction (12). TNF-α inhibition was pointed out as insufficient for long-term treatment in rats with severe polyarthritis (9).

Discussion

Studies have shown that immunoproteasome inhibition diminishes RA progression and ameliorates its manifestation. According to studies, inhibition of LMP7 was the most influential in reducing signs of RA. LMP7 is one of the subunits responsible for the proteolytic activity of the immunoproteasome. Thus, using LMP7 inhibitors, such as PR-957, is a great option for studies in RA treatment, especially when combined with other subunit inhibitors, such as MECL-1 and LMP2 (8, 9, 12). One of the immunoproteasome inhibition effects is the downregulation of cytokine liberation and consequently the pruning of the inflammatory profile and bone and cartilage destruction, much like NFkB pathway depletion (5, 6, 7, 9). Cell differentiation was another effect provided by this inhibition, as the liberation of differentiation stimulators was reduced, such as IL-17 and IL-1, which then reduced Th1 and Th17 TCD4+ cells related to pro-inflammatory activity (8, 9). Liberated by Th1, TNF-α in particular plays a major role in RA pathology as an inflammatory mediator and osteoclast activator, and its liberation depletion was related to arthritic score reduction in rats (5, 9). MG132 activity in reducing neuropathic pain also provides a potential therapeutic option for RA by alleviating the pain symptoms (6). It is important to note that UPS has more subunits that were not presented in the studies in this review and could also be further studied as potential therapeutic targets. Also, none of the studies presented in this review were used on human subjects, therefore the applicability of these compounds as therapeutic drugs could not be assessed. The immunoproteasome inhibition provides a new therapeutic option for RA treatment, with great effects in diminishing inflammatory pathways and preventing disease progression.

Keywords

Immunoproteasome; Proteasome Inhibitors; Rheumatoid Arthritis.

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DOI: 10.62922/4cbffc
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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Neuroprotective Potential of Liraglutide in Alzheimer's Disease

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About this scientific work

DOI: 10.62922/4cbffc.cp099
Link: https://doi.org/10.62922/4cbffc.cp099
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 27/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Alzheimer's Disease (AD) is a neurological disorder in which the brain suffers a progressive loss of mental faculties. an inflammatory environment influences neurodegenerative clinical maintenance (1). This environment is created by an intense release of pro-inflammatory cytokines, hyperactivity of microglia and astrocytes, Aβ-amyloid plaque deposition, neurofibrillary tangles, and protein Tau hyperphosphorylation (2, 3). Insulin resistance is a key factor that contributes to the clinical progression of AD and possibly to its pathogenesis. as in type-2 diabetes (DM2), AD's insulin resistance is associated either with depletion in the expression of insulin receptors or dysfunction in the insulin cascade or in the bind between insulin and the receptors. Insulin receptors are widespread in cerebral regions, especially

in the hippocampus and neocortex, acting not only in the glucose metabolism, but also stimulating neuron growth, modulating catecholamine capture, and helping in the synapses (3). Therefore, studies have been focusing on applying drugs used in the glycemic control of DM2 to find a neuroprotective effect in AD. Liraglutide is an analogue of the hormone GLP-1 used in DM2 as an oral hypoglycemic agent that acts on incretin receptors, stimulating insulin liberation in the pancreatic β-cell. These receptors are also present in the brain, therefore suggesting a potential action on AD's insulin resistance (4).

Aim

Find evidence of liraglutide's neuroprotective potential in AD in the literature.

Methods

This is an exploratory, integrative review study that seeks to answer the following guiding question: “Does liraglutide have a neuroprotective effect in Alzheimer’s Disease?”. to achieve this goal, a bibliographic review was carried out in Biblioteca Virtual em Saúde (BVS), PubMed and Periódicos CAPES using Decs/Mesh descriptors in the following search expressions: (“liraglutide”) AND (“neuroprotective” OR “neuroprotection” OR “neuroprotectant”) AND (“Alzheimer disease” OR “Alzheimer dementia”). The inclusion criteria were studies published between 2020 and 2024 that addressed Alzheimer’s Disease and liraglutide’s administration, whether alone or associated with another compound. Repeated studies and literature reviews were excluded from the analysis.

Results

of the 29 articles found, only 9 were included following the previously established criteria. Most of the works were of a pre-clinical profile. In behavioral assessments performed using the Morris Water Maze (MWM) method, the administration of liraglutide was related to positive results in spatial cognition, a decrease in crossing time between platforms, and an increase in surviving neurons in the cortical and hippocampal regions in AD-induced mice (5, 6, 7, 8, 9). However, there were no changes in the speed of response to aversive stimuli or in motor activity (6). Greater synaptic density and increased growth of dendrites in the hippocampus and cortex were noticed (5). There was also an improvement in the inflammatory profile, with a reduction in the activation of astrocytes and microglia and in the levels of Aβ-amyloid peptides and the pro-inflammatory cytokines TNF-α, IL-6 and INF-γ (10, 11, 12). The insulin resistance status was alleviated with liraglutide showing a reduction in insulin receptor phosphorylation and an increase in the levels of important molecules for the glycolytic pathway, such as insulin receptor substrate 1 (IRS-1) and glycogen synthase kinase 3 beta (GSK-3β) (13). It also decreased the levels of phosphorylation in Tau proteins and beta-secretase-1 (BACE-1), an amyloid Aβ precursor enzyme, contributing to a reduction in the rate of neuronal apoptosis, the number of Aβ-amyloid plaques, and the inflammatory profile (7, 13). The PI3K/Akt signaling pathway was reactivated in AD-induced astrocyte models, which was suppressed, with a concomitant reduction in the oxidative phosphorylation process (5). Both the PI3K/Akt and cAMP/PKA signaling pathways reestablishment contributed to the reduction of the exacerbated production of reactive oxidative species (ROS) by mitochondria and, in the case of the cAMP/PKA pathway, to the restoration of the support function of astrocytes (11, 14).

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

Most of the studies presented in this review have shown that liraglutide does have a neuroprotective effect in AD, at least in in vitro and in AD-induced rats, therefore answering the guiding question. Its neuroprotective effects are mostly due to the reestablishment of insulin usage and the activation of anti-inflammatory pathways. In AD, the glycolytic pathway dysfunction reduces ATP production, thus the energy necessity is only supplied with oxidative phosphorylation processes by the mitochondria, which generate a great amount of ROS. By normalizing the ATP production through the glycolytic pathway, liraglutide diminished ROS production and reduced the oxidative process and its potential proinflammatory triggers, affecting the neuronal synapses and causing neuritic dystrophies (11, 14). Reduction of both hallmarks in AD neurodegeneration (Tau hyperphosphorylation and Aβ-amyloid deposits) by liraglutide administration may reduce neurodegeneration, revert neuronal losses, and prevent further damage (7, 13). Also, by reducing BACE-1 phosphorylation, liraglutide acts directly on the formation of Aβ-amyloid plaques (7, 13). Neuron restoration was linked to the behavioral improvements observed in the MWM test. Some studies observed different cellular pathways upregulation such as the PI3K/Akt pathway increasing the activation of Akt phosphorylation, which, after a downstream cascade, can increase insulin and IGF-1 levels, as it is also important to neural stem cell proliferation. Activation of Akt and GSK-3β is also related to high glucose-related apoptosis of neurons due to its upregulation in the production of antioxidant and anti-apoptotic proteins (13). Reducing cytokine production is expected to alleviate the neurodegeneration of the brain (10, 11, 12). However, these results cannot be used as clinical parameters or substitutes for established treatment protocols. More studies are needed, with clinical application, to assess the therapeutic potential of liraglutide in Alzheimer's Disease.

Keywords

Alzheimer'S Disease; Glp-1 Analogues; Neuroprotective.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Interdisciplinary Study to Assess Pharmacological Interactions in Prescriptions of Psychotropic Drugs for the Elderly in Nursing Homes in the Municipalities of Nova Iguaçu and Seropédica

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About this scientific work

DOI: 10.62922/4cbffc.cp101
Link: https://doi.org/10.62922/4cbffc.cp101
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 24/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

There is a current trend toward increased medicalization in everyday life. This is due to various social, environmental and psychological factors, contributing to an increase in the number of prescriptions to patients, including those of psychotropic drugs to the elderly (1). Due to the increase in life expectancy, elderly people are experiencing polypharmacy, related to the treatment of chronic diseases that require an increase in dosage or a change in the frequency of drug administration (2). Aging is a gradual and natural process that affects various body functions, such as homeostasis and first-pass metabolism. This is probably due to reductions in liver mass and blood flow (3). Allied to this, there can be both an increase in the concentration of drugs that require first-pass metabolism to be excreted and a reduction or delay in prodrug activation. Reduced renal function in the elderly affects the clearance of many drugs (3). In addition, there are also drugs that increase diuresis used to control hypertension, increasing the rate of drug excretion.
In the context of the mental health of the elderly, some psychotropic drugs are used to treat disturbances in sleep patterns, loneliness resulting from the loss of a spouse, anxiety and feelings of sadness, all of which make the elderly a vulnerable social group. Furthermore, when a patient makes use of four or more drugs, there is a high probability of drug interactions occurring, including an increase in

adverse effects, signaled by altered cognition, excessive sedation and an increased risk of falls and fractures (4).

Aim

The general objective of this work was to study the association between medications from the analysis of prescriptions for elderly residents of two nursing homes (NHs), located in the municipalities of Nova Iguaçu and Seropédica, Rio de Janeiro State, seeking to formulate interdisciplinary protocols applied to pharmacological interactions (FI).

Methods

This was a prospective, exploratory cohort study of men and women aged 65 and over. The study was approved by the UFRRJ Research Ethics Committee (CEP) under CAAE number 70683823.7.0000.0311 and opinion number 6.177.708. The prescriptions of elderly people (N = 49) living in the NHs in the municipalities of Nova Iguaçu and Seropédica were analyzed for FI in the databases: Drugs Interaction Checker from Medscape, University of Maryland Medical Center Drug Checker, Micromedex database and in articles in Medline via Pubmed.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

From visits to the NHs, the information regarding the routine administration of medication by the healthcare professionals in charge was analyzed. There were 26 elderly people in the Nova Iguaçu NH, of whom only 20 used psychotropic drugs; while there were 23 elderly people in the Seropédica NH, where 14 used some form of psychotropic drug. Various FIs were found in the prescriptions. At the NH in Nova Iguaçu, 32 moderate-risk FIs were found, 5 higher-risk FIs and one lower-risk FI. In addition, 25 moderate-risk FIs and 3 higher-risk FIs were found in the prescriptions of the NH in Seropédica. The number of interactions varied according to the dosage of the drugs, which were administered at alternate times (morning, afternoon and evening). With regard to polymedication, 53.33% of the elderly in Seropédica were polymedicated, while in Nova Iguaçu this pertained to 45% of the residents. In a general analysis and adding up the drugs with psychopharmacological action in both NHs, there were 139 drugs administered, belonging to the following classes: antidepressants (5.75%), antipsychotics (32.25%), benzodiazepines (14.40%), anticonvulsants (12.95%), sleep inducers (13.67%), treatments for Alzheimer's disease (15.83%) and antiparkinsonians (2.61%).
No errors were found during the dispensing, storage and organization of medicines in the wards. The elderly were monitored for blood pressure and blood glucose levels on a daily basis and were attended to by the nurse in charge if necessary. When faced with an assessment for more specialized care, the elderly were referred to the public hospital that serves the respective region.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

With regard to risks, the definition from the "drugs.com" platform was accepted, in which the main or greatest risk was clinically the most significant of all and should be avoided, since the risks outweighed the benefits in this association. Moderate risk was less clinically significant. However, it should also be avoided, except in strictly necessary cases, and should be assessed on a case-by-case basis. The lower risk was not clinically significant. It is worth noting that many of the FIs were synergistic pharmacokinetics and occurred due to concomitant use of drugs that intensify a desired effect, since many of the elderly had been using the drugs for a year or more. Considering the neuroadaptation effect, explained by the development of tolerance, it was necessary in many patients to increase the dose or use another drug in association, so that synergism occurs and the desired therapeutic efficacy is achieved. In addition, many of the drugs used were potentially unsuitable for the elderly, since they could cause accidents such as falls, increasing the risk of fractures, as well as increasing cognitive impairment due to the risk of delirium and sedation (5). The number of elderly people using a particular psychoactive drug at any given time was also investigated, and we found that eight elderly people in the Seropédica NH used clonazepam at night, probably to induce sleep. In contrast, at the Nova Iguaçu NH, 10 elderly people used promethazine at night for the same purpose. In order to analyze the FIs, we also investigated how dispensing took place to the elderly. At both NHs, we identified the use of a plastic object, one with a yellow lid and the other with a red lid, both transparent and containing the elderly person's name written under a ribbon, for identification and unitarization purposes. The colors were related to the time the medication was used, yellow for day and red for night. In this way, greater importance was attached to knowing whether the medicines were removed from their primary packaging and grouped all together in the same container for a long period of time, possibly causing interactions between the adjuvants of these medicines, if they were not compatible, in addition to other sources of degradation, such as humidity, hydrolysis, oxidation and others. It is important to note that some of the elderly who live in NHs have been rescued from a situation of vulnerability, where they did not have the support of their families or someone else to help them. On average, these elderly people needed to take around six tablets a day, and in order for pharmacological therapy to achieve its objective, it is essential for patients to use the medication correctly. Therefore, being under the responsibility of a health team in the daily life of the NH improves the process of caring for the elderly. For this reason, prescriptions need to be assessed on a case-by-case basis, and the elderly must be observed so that they do not suffer from effects such as exacerbated sedation. It is therefore necessary to create a protocol so that pharmacological modifications can be made, such as changing the time and frequency and/or dose, assessing how the elderly person will react from a therapeutic point of view. In more serious cases, discontinuation and/or replacement of the medication should be assessed.

Keywords

Drug Interactions; Institutionalized Elderly Health.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Drug Interactions in Adult Patients with Cystic Fibrosis at a Reference Center in Southern Brazil

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About this scientific work

DOI: 10.62922/4cbffc.cp102
Link: https://doi.org/10.62922/4cbffc.cp102
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 24/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The treatment of adults with cystic fibrosis (CF) and possible comorbidities is complex and involves a high number of medications with the potential for drug interactions (DI) (1,2). In Brazil, cystic fibrosis transmembrane conductance regulator (CFTR) protein modulators medications are recommended for certain genotypes, with the elexacaftor/tezacaftor/ivacaftor combination recently approved by the National Committee for Health Technology Incorporation into the Unified Health System. CFTR protein modulators are metabolized by CYP450, particularly interacting with drugs that induce CYP3A4 (phenobarbital, carbamazepine, phenytoin, rifampicin) and drugs that inhibit CYP3A4 (azole antifungals, amiodarone, erythromycin, clarithromycin, ritonavir) (3).

Aim

To identify the prevalence of DIs in a reference center for adults with CF.

Methods

A cross-sectional study with prospective data collection, conducted at a single CF reference center in southern Brazil, from March 2021 to August 2022. The study was approved by the Ethics and Research Committee number 2020-0658 and CAAE 40645 820.5.0000.5327. DI analysis was conducted by

consulting the UpToDate - Lexicomp® Drug Interactions database, classifying findings into the following categories: a - no known drug interactions; B - no action required; C - monitor treatment; D - consider treatment modification; X - avoid combination.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

of the total 65 adults diagnosed with CF, 35 (53.8%) reported using medications prescribed only by the CF reference center, while 30 (46.2%) used medications prescribed also by external care. The median medication use was 9, and 52 patients (80.0%) practiced self-medication. Overall, 14 individuals (21.5%) presented X-type DI and 26 individuals (40%) presented D-type DI. The presence of external prescription, compared to exclusive prescription from the CF reference center was associated with a higher number of X and D-type DIs; respectively, 20 (64.5%) versus 11 (35.5%), p=0.010.

Discussion

A large proportion of clinically significant medication interactions is related to metabolism by cytochrome P-450 (CYP450) enzymes. CYP450 enzymes are found in many cells but are most concentrated in hepatocytes. Drug activity on CYP450 enzymes can result in both enzyme induction and inhibition. Induction causes increased metabolism of another drug, usually leading to reduced exposure and consequent reduced clinical efficacy. Alternatively, if the enzymatic substrate is a prodrug that requires metabolism to one or more active metabolites, induction of the CYP450 enzyme can result in increased levels of active metabolites, potentially resulting in toxicity. Enzyme inhibition results in increased concentrations of drug substrates, potentially leading to toxicity. Some medications used in cystic fibrosis have significant interactions with CYP450 enzymes (3,4). The prevalence of clinically relevant DIs included CFTR protein modulators, antimicrobials, antiretrovirals, immunosuppressants, antidepressants, anticholinergic agents, corticosteroids, contraceptives, antihistamines, antacids, analgesics and anti-inflammatories. The pharmacist contributes to the pharmacotherapeutic monitoring of adult patients with CF, especially in the evaluation of DIs and medication reconciliation during care transitions (5,6).

Keywords

Drug Interactions; Cystic Fibrosis; Pharmacotherapy.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Potential Pharmacological Effect of the Monoclonal Antibody Donanemab in the Treatment of Alzheimer's Disease

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About this scientific work

DOI: 10.62922/4cbffc.cp103
Link: https://doi.org/10.62922/4cbffc.cp103
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 24/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Alzheimer's disease (AD) represents one of the greatest challenges of modern medicine. It is a chronic, progressive neurodegenerative disease that affects millions of individuals worldwide. It is estimated that upwards of 50 million people live with dementia (1); of these, Alzheimer's disease constitutes 60–70% of these cases, making it one of the leading causes of death and disability among the elderly population, leading to a gradual decline in cognitive functions, memory, and functional abilities (2). The pathology of Alzheimer's disease is complex and involves the interaction of multiple genetic, environmental, and

biological factors. The main pathological markers include the formation of extracellular amyloid plaques, resulting from the abnormal accumulation of beta-amyloid peptide, and intracellular neurofibrillary tangles, composed of hyperphosphorylated tau protein (1). These pathological deposits are accompanied by a series of neurodegenerative events, such as synaptic loss, chronic inflammation, and neuronal death, culminating in the progressive deterioration of brain functions (2). In recent years, Alzheimer's disease research has advanced significantly, providing a deeper understanding of the underlying mechanisms of its progression and paving the way for the development of new therapeutic approaches. Among these, donanemab stands out as a monoclonal immunoglobulin G1 antibody, developed to specifically bind to the insoluble modified form of the N-terminal end of amyloid exclusively present in brain amyloid plaques (3,4). Donanemab works by facilitating the removal of these plaques through microglial cell-mediated phagocytosis, a process that can slow disease progression and improve patients' quality of life (1).

Aim

This literature review aims to explore the advances and perspectives in Alzheimer's disease treatment using donanemab.

Methods

This is a literature review in which studies indexed on the PubMed platform from 2019 to 2024 were researched. The Health Sciences Descriptors used were "Alzheimer Disease", "Amyloid beta-Peptides", "Monoclonal Antibodies", and “Donanemab” using the corresponding Boolean operator.

Results

After analyzing 18 volumes of literature, 7 studies were selected that presented free full texts and were relevant to this review's topic. Studies with donanemab in Alzheimer's disease revealed its efficacy and significant impact as a therapy. This substance, a pioneering antibody in clinical development, specifically targets the modified form of amyloid-β, pGlu3-Aβ, associated with early stages of the disease and cognitive decline (1,3). The TRAILBLAZER-ALZ study showed significant reductions in plasma levels of phosphorylated tau 217 (pTau217) and glial fibrillary acidic protein with treatment, indicating a positive effect on disease modification and potentially slowing its progression (4). The TRAILBLAZER-ALZ 2 clinical trial demonstrated that donanemab can delay disease progression in patients with mild cognitive impairment or early-stage Alzheimer's dementia, reducing brain Aβ plaque load (3,4,5). Targeting the modified N-terminal Aβ peptides, donanemab showed efficacy in clearing brain plaques, which may be crucial in halting disease progression in its early stages (2). Compared to other antibodies, donanemab showed lower binding to cerebral amyloid angiopathy fibers (3) and significant efficacy in altering cognition. Studies in transgenic mice (1) also highlighted the reduction of Aβ42 and pGlu3-Aβ42 levels in the brain with donanemab use, especially when combined with the glutaminyl cyclase inhibitor PQ912. Phase 2b research showed a significant reduction of Aβ plaques in the brains of patients with early Alzheimer's disease (3). These results indicate the potential of donanemab as a promising therapy for Alzheimer's disease treatment.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

Studies indicate that donanemab may have a positive impact on Alzheimer's disease modification, as demonstrated by the decrease in plasma biomarkers associated with its pathology. Biomarkers such as pTau217 and glial fibrillary acidic protein provide additional evidence of the changes in Alzheimer's disease pathology resulting from anti-amyloid therapy, underscoring their importance in evaluating treatment response (4). These reductions suggest a possible beneficial effect of donanemab in modifying Alzheimer's disease, indicating a potential influence on the underlying pathological processes of its progression. Positive results also report a reduction in brain plaque load and delayed clinical deterioration in patients with mild cognitive impairment or early-stage Alzheimer's dementia (2, 3, 4). Furthermore, donanemab's variable binding to CAA Aβ fibrils in different individuals recommends a complex interaction between the antibody and fibril composition, which could have implications for treatment efficacy and safety, especially considering the association of AβpE3-40 (3). These results emphasize the importance of considering patient heterogeneity and amyloid deposit composition when evaluating the efficacy and safety of antibody-based therapies for Alzheimer's disease. Additionally, the discussion on the use of donanemab in Alzheimer's disease highlights its promise as a disease-modifying treatment, especially amid the new generation of therapies being tested at higher doses and earlier disease stages. However, it is crucial to highlight the limitations of these studies, including the small sample size, exploratory nature of the analyses, and lack of correction for multiple testing (6, 7). Therefore, more clinical studies, such as TRAILBLAZER-ALZ2, which includes a larger sample size, are needed to confirm the results and deepen the understanding of donanemab's impact on plasma biomarkers and Alzheimer's disease progression. This literature review reinforces the importance of these study findings, suggesting that donanemab has the potential to be an effective therapy for Alzheimer's disease. However, more clinical studies are necessary to confirm these findings and evaluate the long-term safety and efficacy of donanemab as a treatment for the disease.

Keywords

Alzheimer Disease; Donanemab; Monoclonal Antibodies.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Therapeutic Perspectives on the Use of Cannabis in the Management of Autism Spectrum Disorder (ASD)

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About this scientific work

DOI: 10.62922/4cbffc.cp104
Link: https://doi.org/10.62922/4cbffc.cp104
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 24/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Autism Spectrum Disorder (ASD) is described in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), as a neurodevelopmental disorder characterized by persistent deficits in communication and social interaction, as well as restricted and repetitive behaviors (1,2). The severity of ASD is classified based on the level of support needed, ranging from mild to severe. There are no treatments that cure ASD; current interventions only alleviate symptoms such as irritability and agitation, usually with psychotropic drugs. There is growing interest in new therapies that may be more effective or

reduce the side effects of psychotropics (1). One alternative therapy investigated is cannabis extract rich in cannabidiol (CBD), which has various therapeutic properties and is well tolerated. Tetrahydrocannabinol (THC) has psychoactive effects and acts on the endocannabinoid system, influencing aspects such as anxiety and cognition. These compounds are studied as potential alternatives for alleviating ASD symptoms due to their interaction with cannabinoid receptors in the central nervous system (3).

Aim

This study aims to review the available scientific evidence on the therapeutic use of cannabis in the management of autism.

Methods

This is a literature review in which studies indexed on the PubMed platform within the last 5 years were searched. The Health Sciences Descriptors "Autistic Disorder", "Autism Spectrum Disorder", and "Cannabis" were used, employing the corresponding boolean operator. Only freely accessible full-text articles related to the topic were included in the review.

Results

After the review, 12 relevant studies were identified. Of these, 5 studies were excluded because they were not freely available. Of the remaining 7 studies, 6 were selected for analysis. The compiled results revealed that CBD-rich cannabis extract demonstrated efficacy in reducing ASD symptoms (1,4-6). Studies in mice suggest that CBD may attenuate autistic behaviors and associated comorbidities. Specific doses of CBD reduced hyperlocomotion behavior and rescued social deficits, allowing them to exhibit social preferences similar to control B6 mice (4). In order to investigate de safety of the utilization, one study investigated the efficacy of the treatment using a semi-structured interview and the Autism Treatment Evaluation Checklist (ATEC), filled out by family members before and after the clinical trial. Comprehensive laboratory assessments, including renal and hepatic function tests, complete blood counts, and fasting glucose measurements, were conducted to assess the safety of the treatment. These analyses indicated significant improvement in ASD symptoms after treatment with CBD-rich cannabis extract without severe adverse effects, reinforcing the safety of this type of intervention (1). Evaluate the safety, which is important due to the characteristics of the population that are more often targeted for ASD treatment. One study showed that the use of cannabis oil rich in CBD content was examined in children and adolescents with ASD, focusing on the assessment of its biochemical safety over three months. The results showed that cannabis oil with a 20:1 CBD:THC ratio had a favorable safety profile (6). an additional study involving 59 children with ASD demonstrated that CBD-rich cannabis oil was well tolerated during six months of treatment without causing significant changes in monitored biochemical parameters (3).

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

The review of available studies indicates that CBD could be a promising drug for treating ASD symptoms such as repetitive and restricted behaviors, social deficits, and hyperactivity (1,2,5,6). The efficacy of CBD appears to be dose-dependent, with different doses required for specific therapeutic targets, consistent with existing clinical literature (4). The compiled results suggest that CBD-rich cannabis extract could be an effective and safe option for improving ASD symptoms. However, it is important to note that more research with larger participant samples is needed to confirm these findings and explore the therapeutic potential of CBD in ASD patients (5). The safety of CBD treatment was assessed in several studies, including comprehensive laboratory tests, and no severe adverse effects were observed, reinforcing the safety of this type of intervention (1,3,6). Furthermore, the absence of significant differences in outcomes between patients who received co-medications or higher doses of CBD compared to others suggests that CBD-rich cannabis oil may be a safe option for treating ASD symptoms in children and adolescents (3). Despite promising results, future research should focus on exploring the mechanism of action of CBD in ASD treatment and establishing clear guidelines for dosage and treatment duration (6). This is crucial for developing effective and personalized therapeutic strategies for individuals with ASD. In summary, the conclusion of this review is that the use of CBD-enriched extract from the Cannabis sativa plant has shown potential in treating Autism Spectrum Disorder symptoms, with most patients showing improvements in various symptom categories. However, a larger body of research is necessary to confirm these findings and guide the clinical application of CBD in ASD treatment.

Keywords

Autistic; Autism Spectrum Disorder; Cannabis.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Sex Hormones as Therapeutic Targets in the Pathophysiology of Migraine

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About this scientific work

DOI: 10.62922/4cbffc.cp105
Link: https://doi.org/10.62922/4cbffc.cp105
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 21/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Migraine is a primary headache disorder recognized by the World Health Organization as one of the most debilitating and misunderstood neurological conditions in the world (1,2). Migraine is a lifelong headache disorder that causes severe unilateral facial pain, throbbing, photophobia, phonophobia, nausea, and other distressing symptoms that significantly reduce the patient's quality of life (3,4). Migraine is diagnosed based on attack frequency and aura. When headache symptoms are present for at least three months, episodic migraine is defined as 0 to 14 headache days per month, while chronic migraine

requires 15 or more headache days (4,5). Chronic pain, including migraine, is diagnosed more frequently in cisgender women (1,2,3,4,5,6). This suggests that female sex hormones may play a significant role in mediating chronic pain, while androgens may offer protection against these conditions. This review addresses the major sex hormones and the molecular mechanisms by which they influence the pathophysiology of migraine. We explore how variations in estrogen, progesterone, and other female hormone levels can impact the frequency and intensity of migraine attacks. We also discuss the role of androgens and their potential protective functions. Understanding these mechanisms is crucial for developing more effective and personalized treatments for migraine, especially for populations most affected by this debilitating condition.

Aim

This study aims to compile data from the literature regarding the influence of sex hormones on the pathophysiology of migraine and to explore their potential as therapeutic targets for preventing and treating the condition.

Methods

This is a literature review. The analysis searched for articles in the PubMed and Virtual Health Library (VHL) databases. The Health Sciences Descriptors “Disorders Migraine”, “Prolactin”, and “Sex Hormone” were used, utilizing the corresponding Boolean operator. The inclusion criteria included articles and clinical trials published in Portuguese, English, and Spanish between 2019 and 2024.

Results

After reviewing 15 publications, six studies were selected for being freely accessible and having discussions focused on the topic at hand. All studies indicated that variations in estrogen and progesterone levels during the menstrual cycle could trigger or modulate migraine attacks in women. Estrogen is associated with changes in pain sensitivity and neurotransmitter regulation, while progesterone can have both protective and triggering effects (2,6). Prolactin (PRL) and oxytocin (OT) emerge as therapeutic targets due to the regulation of oxytocin receptors by estrogens and the influence of prolactin receptors (PRLR) in complex hormonal interactions (1,2,3,5). Studies show that activation of PRLR in sensory neurons can modulate pain sensitivity and contribute to stress-induced facial hypersensitivity in migraine models (1,5). Differential expression of estrogen and progesterone receptors in the female trigeminal ganglion was observed, significantly influencing the occurrence of migraines (5,6). In postmenopausal migraine patients, estradiol, progesterone, and testosterone levels are lower, while prolactin levels are higher (2). Therefore, there is a negative correlation between estradiol levels and the duration, frequency, and severity of migraines (2). Chronic migraine patients have higher prolactin levels compared to healthy controls, suggesting a link to the frequency of attacks (4,6). Statistical analyses considering body mass index reinforce the importance of multiple factors in investigating the relationship between sex hormones and migraine (1,5).

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

It is essential to better understand the complex hormonal interactions in migraine and the importance of further investigating the role of prolactin, oxytocin, and other hormones in the pathophysiology and treatment of migraine. Understanding and identifying potential therapeutic targets, such as PRL and OT, opens new perspectives for innovative approaches in migraine management, considering sexual differences, hormonal fluctuations, and the associated pathophysiological complexities of this condition. Elevated prolactin levels are associated with induction and progression of migraine; the differential expression of sex hormone receptors in the trigeminal ganglion may influence the occurrence of migraine in women, highlighting the need for future research to elucidate these mechanisms (2,4,5). The negative correlation between estradiol levels and clinical characteristics of migraine, especially in postmenopausal patients, suggests that interventions targeting hormonal levels could be considered in managing this condition in women of this age group (2). The disparity observed in prolactin levels between migraine patients and healthy controls, even after considering body mass index, reinforces the hypothesis that prolactin may play a crucial role in migraine pathophysiology (1,5). These results indicate that investigating the role of sex hormones in migraine is fundamental for developing more targeted and effective therapeutic approaches. In summary, the conclusion of this review highlights the growing need to understand the complex hormonal interactions in migraine and the need to further investigate the role of prolactin, oxytocin, and other hormones in the pathophysiology and treatment of migraine. Understanding and identifying potential therapeutic targets opens new perspectives for innovative approaches in migraine management, considering sexual differences, hormonal fluctuations, and the associated pathophysiological complexities of this condition. Therefore, the importance of future research for developing more targeted and effective therapeutic approaches is evident.

Keywords

Disorders Migraine; Prolactin; Sex Hormone.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Future of Modern Oncology Driven By Multifunctional Nanoparticles and Their Innovative Applications in Cancer Treatment

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About this scientific work

DOI: 10.62922/4cbffc.cp106
Link: https://doi.org/10.62922/4cbffc.cp106
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 19/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Cancers have become a serious challenge to global health, despite significant progress in treatment, including chemotherapy, radiotherapy, immunotherapy, photodynamic therapy (PDT), and photothermal therapy. There are still considerable limitations, such as toxic side effects that damage healthy tissues and the induction of multidrug resistance (MDR) in tumors after prolonged treatments (1). Multifunctional nanoparticles (NP) have attracted great interest for their applications in both diagnostics

and therapeutics over the last few years. Nanotechnology-based drug delivery systems can carry multiple drugs and target them to tumors through passive targeting due to damaged or immature tumor vessels, a phenomenon known as the enhanced permeability and retention effect. Thus, these nanoparticles designed for diagnostics can monitor the delivery of chemotherapeutic agents and guide cancer therapy, being a safe method that allows a high drug loading without the need for additional transporters (2,4,5).

Aim

Explore the advancements and therapeutic potential of multifunctional nanoparticles in antineoplastic therapy.

Methods

It consists of a literature review in which studies indexed to the PubMed platform between 2019 and 2024 were searched. The Health Sciences Descriptors “Multifunctional Nanoparticles”, “Neoplasm”, “Antineoplastic agents” and “Antineoplastic protocols” were used, utilizing the corresponding boolean operator. Only open-access articles with full text related to the topic were included in the review.

Results

The search for studies investigating the use of multifunctional nanoparticles in cancer treatment resulted in 12 articles. Of these, 7 were excluded due to the unavailability of free access, leaving 5 studies for in-depth analysis. The data collected from these scientific studies revealed that the developed nanoparticles showed remarkable efficacy in cancer treatment (1,2,3,4,5). All selected studies demonstrated significant inhibition of cancer cell proliferation and migration, as well as promoting an increase in the rate of apoptosis. These results are particularly promising, as they suggest a robust ability of nanoparticles to combat tumor growth. Toxicity assessments performed in animal models did not indicate obvious signs of toxicity when compared to control groups, which is a positive point for the safety of treatments based on these nanoparticles (2,3,4). Furthermore, pharmacokinetic analysis showed that the release of drugs carried by nanoparticles is faster in acidic pH environments (6,8) than in neutral pH (7,4) (4,5). This property is especially beneficial as tumors often have a more acidic pH than healthy tissues, allowing for a more targeted release of the drug at the tumor site. The nanoparticles also exhibited considerable stability over time and high drug encapsulation efficiency (3,4,5). These findings indicate that multifunctional nanoparticles have great potential to be used in cancer treatment, offering a new strategy to improve the efficacy and reduce the side effects of chemotherapy.

Discussion

The results obtained from the analyzed studies provide strong evidence of the therapeutic potential of multifunctional nanoparticles in cancer treatment. The ability of these nanoparticles to effectively inhibit cancer cell proliferation and migration, as well as increase apoptosis, suggests they could be a powerful tool in the fight against cancer (1,2,3,4,5). The absence of significant toxicity in animal models is a crucial

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

aspect, as it indicates these nanoparticles may be safe for human use (2,3,4). The controlled release of drugs in response to the acidic pH of tumors is an innovative feature that can significantly improve treatment targeting the tumor site, minimizing side effects in healthy tissues (4,5). This property can be especially useful in overcoming multidrug resistance, a common challenge in cancer treatment. The stability of the nanoparticles and their ability to effectively encapsulate drugs are fundamental for clinical viability, as they ensure that the drugs are reliably delivered to the desired target (3,4,5). These results highlight the importance of multifunctional nanoparticles as a promising approach to cancer treatment, offering new hope for patients and opening new perspectives for research and the development of more effective and less toxic therapies. In summary, the reviewed studies provide a solid foundation for the advancement of multifunctional nanoparticles as an innovative strategy in cancer treatment. The combination of therapeutic efficacy, safety, and precise targeting offers a new direction for oncology, with the potential to revolutionize the field of cancer treatment.

Keywords

Antineoplastic Agents; Multifunctional Nanoparticles; Neoplasms.

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Psychotropic Drugs: a Critical Review of Their Use in Adolescents and Children

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About this scientific work

DOI: 10.62922/4cbffc.cp107
Link: https://doi.org/10.62922/4cbffc.cp107
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 30/06/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The mental health of children and adolescents is a complex and increasingly relevant issue in Brazil (1,2). There are numerous mental disorders at this stage of life, and incorrect diagnoses, and inappropriate prescriptions of medications are becoming more frequent. The misuse of psychotropic drugs can lead to adverse effects, reactions, and dependency (3,4).

Aim

The objective of this study was to conduct a literature review on the use of psychotropic drugs by children and adolescents.

Methods

The research was conducted in the databases Google Scholar, PubMed, and Scielo, where scientific articles published between 2007 and 2022 were identified. The key terms used were "psychotropics," "psychopharmaceuticals," "children," "adolescents", "mental health", "mental disorders", and "pharmaceutical care." the selection criteria included original articles, reviews, randomized clinical trials, cohort studies, and book chapters relevant to the topic. Publications such as opinion pieces, reflections, editorials, or those not aligned with the scope and objective of the study were excluded. Additionally, a manual search of the references of the selected works was conducted.

Results

From this research, it was found that the use of psychopharmaceuticals in children and adolescents is quite frequent. A survey conducted at the Child Psychosocial Care Center (CAPSi) in a municipality in the northern region of the state of Rio Grande do Sul recorded the main psychotropic medications used by patients aged 2 to 17. These were risperidone – 36.3% (antipsychotic), methylphenidate – 15.8% (stimulant), and fluoxetine – 13.7% (antidepressant). Furthermore, mental disorders during childhood and adolescence are prevalent, particularly attention deficit hyperactivity disorder (ADHD), which, without proper attention, becomes difficult to diagnose and treat adequately, resulting in future problems throughout life. The comprehensive approach to health care should consider the family unit as a focus, promoting multidisciplinary care and strengthening family bonds (7). In the treatment of children and adolescents, psychotropics should not be the only strategy, being combined with psychosocial therapies and other integrative practices (4). Although initially developed for adults, the use of psychotropics in young people has increased, notably methylphenidate for ADHD and selective serotonin reuptake inhibitors (SSRIs), which inhibit serotonin reuptake, for anxiety and depression (4,8,9).

Discussion

Adherence to treatment is a challenge, often impaired by a lack of information and proper guidance (8,10). Inappropriate prescription and indiscriminate use of medications reinforce the need for pharmaceutical care, with pharmacists playing a crucial role in education, guidance, and therapeutic follow-up to ensure the rational and safe use of medications (3,10). The use of psychotropic medications presents challenges that underscore the need for careful prescription and well-trained health professionals to guide and monitor patients and their families. This ensures treatment adherence, minimizes errors, and promotes the rational and safe use of medications. Ultimately, this would lead to a better quality of life for young people in treatment.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Childhood; Adolescence; Psychopharmaceuticals; Mental Disorders.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Study to Optimize the Manufacturing Process of Omeprazole Suspension in the Pharmacotechnical Hospital Service of a Universitary Hospital: an Integrative Literature Review

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About this scientific work

DOI: 10.62922/4cbffc.cp108
Link: https://doi.org/10.62922/4cbffc.cp108
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 16/05/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Proton pump inhibitors (PPI) are the most prescribed class of medications in the world for various acid-peptic disorders and one of the main representatives is omeprazole (1,2). It acts by inhibiting the final stage of acid formation in the stomach, thus providing highly effective action, both basal and stimulated acid secretion, regardless of the stimulus, helping to protect the wall of the stomach or duodenum, as the inhibition of acidity facilitates the healing process of ulcers, erosions or inflammations(3). Critically ill patients who are at risk of developing stress-related mucosal injury, where a decrease in gastric pH, increased permeability of the gastric mucosa and ischemia can be observed, leading to an increase in morbidity and mortality in units intensive care unit (ICU). Among the probable risk factors for stress ulcer, several studies have suggested that mechanical ventilation is one of the most important, both for adults and children admitted in ICU's (4). It is provided by the SUS (Sistema Único de Saúde) in the pharmaceutical form of capsules, in dosages of 10 mg and 20 mg and also in injectable form (5); There is no commercial liquid formula for omeprazole; Thomson and Lindsay (2000, apud Lima, 2009)(6) state

that many patients who are unable to receive medications orally have the option of receiving therapy through an enteral tube, but many drugs are not administered for the purpose of administration via enteral tube and due to the scarcity of information found in the literature and also in manufacturers' specifications, many of the clinical procedures followed may be based on empiricism and sometimes carried out without adequate technical criteria. Its large-scale production in this format becomes umpractible due to its instability, so the best alternatives are to produce extemporaneous oral suspension and/or adapted pharmaceutical forms and the challenges considered for this process are the stability of the formula, inactivation of the active ingredient and also in relation to flavor and sodium content (7,8).

Aim

The objective of the work was to present an integrative bibliographic review, analyzing what was researched in relation to liquid formulations of omeprazole in the period from 2013 to 2023 then to use the results of this work to optimize the omeprazole suspension production process at the aforementioned hospital.

Methods

The guiding research question was constructed by the acronym PCC, where P is equal to population or problem, or in the case of this study “liquid formulations of omeprazole”, C is equal to concept or “alternatives” and the other C corresponds to context “published in scientific literature” and was as follows: “Are there alternatives for manufacturing oral liquid formulations of omeprazole traditionally handled in hospitals published in scientific literature in the last 10 years?”. The terms or keywords or related subjects and alternative terms/synonyms related to the research inclusion criteria were searched in Descriptors in Health Sciences - DeCS (DeCS, 2017) (9) in Portuguese and/or in Medical Subject Headings – MeSH (MeSH, 2022)(10) in English. The databases Pubmed, VHL (Virtual Health Library), Embase, Scopus and Web of Science were chosen. The data were tabulated for analysis and qualitative and quantitative methodology was used using descriptive statistics, demonstrating absolute frequency and calculating the relative frequency (percentage). The tables included: formula, patient, use, omeprazole concentration, vehicle, pH, sweetener, flavoring, preservative, storage conditions, time and temperature. Of the 130 articles retrieved were analyzed using the Rayyan®(11) application, 5 remained and were included in the analyzes and of these, 18 formulas were analyzed where we can see: Omeprazole concentration most observed: C = 2 mg/mL - 16 formulas (88,89%); Most formulas for oral use: oral - 15 formulas (83,3%); oral and/or tube - 3 formulas (16,7%); Vehicles employed: alginate and calcium carbonate in aqueous solution - 9 formulas (50%); sodium bicarbonate solution 8,4% - 4 formulas (22,22%); sodium bicarbonate 8,4%, xanthan and water - 1 formula (5,56%), OraSweet®(12) 2 formulas (11,11%); sodium bicarbonate solution 0,1% - 1 formula (5,56%); sesame oil at 37,5% and Labrafac®(13) at 42% - 1 formula (5,56%); Patients: in vitro - 11 formulas (61,11%); pediatric and/or adult patients (over 16 years old) - 4 formulas (22,22%); pediatric patients - 2 formulas (11,11%); adults only (over 16 years old) - 1 formula (5,56%); Preservatives: methylparaben (0,18 g) and propylparaben (0,2 g) - 9 formulas (50%); No use of preservatives - 4 formulas (22,22%); 0,10% sodium bisulfite - 2 formulas (11,11%); methylparaben and potassium sorbate (found in OraSweet®) - 2 formulas (11,11%); benzyl

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

alcohol 0,5% - 1 formula (5,56%); Sweeteners: aspartame 0,11%, - 1 formula (5,56%); sucralose in granules (CAS No. 56038-13-2) - 1 formula (5,56%); OraSweet® (sucrose, glycerin, sorbitol) - 2 formulas (11,11%); sodium saccharin 0,2% - 2 formulas (11,11%); 70% sorbitol solution (20.0%) and sodium saccharin (0,25%) - 2 formulas (11,11%); Flavorings: No use of flavorings - 11 formulas (61,11%); red fruit citrus flavor - 2 formulas (11,11%); mint essence - 2 formulas (11,11%); vanilla essence - 1 formula (5,56%); strawberry flavor - 1 formula (5,56%); caramel flavor F-2093 - 1 formula (5,56%); The research objectives were achieved, as it was possible to analyze a diversity of results and as a limitation it was observed the lack of access to complete PDFs for some articles. Alginate and calcium carbonate vehicle in water - good bioavailability and protection of omeprazole in the stomach, but it was an in vitro study(14); Use of sodium bicarbonate as a vehicle - flavor limitations, increased sodium content and compromised efficacy in gastric acid pH. Oral omeprazole suspensions have shown greater efficacy than intravenous pantoprazole in increasing gastric pH, with greater potential to prevent upper gastrointestinal bleeding(15); Sodium bisulfite and parabens: satisfactory physical-chemical and microbiological stability, although there are concerns about adverse reactions to these preservatives; Commercial omeprazole formula: more consistent in terms of concentration of active pharmaceutical ingredients than a traditionally compounded suspension and both formulas demonstrated good performance for administration through a nasogastric tube on the same day of compounding(8); Sweeteners: aspartame (phenylketonuria) and sucrose (concerns about tooth decay, chronic diseases and technical problems) (16). Data presented by the stability studies carried out, such as formula, conditions, time, temperature and in Boscolo, et al. (2020)(17): formula a - under refrigeration (4°C) = 150 days; at room temperature (25°C) = 2 weeks; formula B: under refrigeration 4°C = 90 days; both formulas had adequate physical, chemical and microbiological stability. The omeprazole particles were distributed homogeneously ensuring the correct dose when administered to pediatric patients. In Cruz-Sanmartín, Pérez-Martínez, Rabasco-Álvarez, 2015 (18): all formulas under refrigeration and photoprotection had a percentage of degradation ≤ 2% during the first week from the the stability study start and percentage between 2 and 4% after one month. In Jackson, Lewis, Brown, 2020 (8): commercial suspension (First® Omeprazole)(19) of omeprazole (2 mg/mL) stored kept under refrigeration, in transparent luer-lock oral syringes = 30 days and it retained potency between 90% and 110% based on initial concentration; suspension manipulated (2 mg/mL) with sodium bicarbonate and Orasweet® under refrigeration, stored in transparent luer-lock oral syringes = 14 days and it maintained potency between 90% and 110% of the initial concentration. Alginate and calcium carbonate vehicle in water - good bioavailability and protection of omeprazole in the stomach, but it was an in vitro study; Use of sodium bicarbonate as a vehicle - flavor limitations, increased sodium content and compromised efficacy in gastric acid pH. Oral omeprazole suspensions have shown greater efficacy than intravenous pantoprazole in increasing gastric pH, with greater potential to prevent upper gastrointestinal bleeding; Sodium bisulfite and parabens: satisfactory physical-chemical and microbiological stability, although there are concerns about adverse reactions to these preservatives; Commercial omeprazole formula: more consistent in terms of concentration of active pharmaceutical ingredients than a traditionally compounded suspension and both formulas demonstrated good performance for administration through a nasogastric tube on the same day of compounding; Sweeteners: aspartame (phenylketonuria) and sucrose (concerns with tooth decay, chronic diseases and technical problems). The omeprazole suspension formulation currently used at the aforementioned universitary hospital , for oral and tube

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

use, contains omeprazole pellets and 8,4% sodium bicarbonate vehicle, and has demonstrated practical results that do not justify continuing with this method, therefore, the aim is to use the results of this work to optimize this production process. We consider that one of these alternatives described in Boscolo et al. (2020)(17) has the potential to positively impact the preparation process of our omeprazole suspension. formula a and formula B accessible for different work realities and presented good stability study results (150 and 90 days respectively, under refrigeration). formula B still stands out, as it does not use omeprazole pellets, which reduces preparation time, and contains sweetener and flavoring to increase adherence. An ideal formulation must be effective, safe, stable, should promote patient adherence and should be financially viable for the institution.

Results

of the 130 articles retrieved were analyzed using the Rayyan®(11) application, 5 remained and were included in the analyzes and of these, 18 formulas were analyzed where we can see: Omeprazole concentration most observed: C = 2 mg/mL - 16 formulas (88,89%); Most formulas for oral use: oral - 15 formulas (83,3%); oral and/or tube - 3 formulas (16,7%); Vehicles employed: alginate and calcium carbonate in aqueous solution - 9 formulas (50%); sodium bicarbonate solution 8,4% - 4 formulas (22,22%); Sodium bicarbonate 8,4%, xanthan and water - 1 formula (5,56%), OraSweet®(12) 2 formulas (11,11%); Sodium bicarbonate solution 0,1% - 1 formula (5,56%); sesame oil at 37,5% and Labrafac®(13) at 42% - 1 formula (5,56%); Patients: in vitro - 11 formulas (61,11%); pediatric and/or adult patients (over 16 years old) - 4 formulas (22,22%); pediatric patients - 2 formulas (11,11%); adults only (over 16 years old) - 1 formula (5,56%); Preservatives: methylparaben (0,18 g) and propylparaben (0,2 g) - 9 formulas (50%); No use of preservatives - 4 formulas (22,22%); 0,10% sodium bisulfite - 2 formulas (11,11%); methylparaben and potassium sorbate (found in OraSweet®) - 2 formulas (11,11%); benzyl alcohol 0,5% - 1 formula (5,56%); Sweeteners: aspartame 0,11%, - 1 formula (5,56%); sucralose in granules (CAS No. 56038-13-2) - 1 formula (5,56%); OraSweet® (sucrose, glycerin, sorbitol) - 2 formulas (11,11%); sodium saccharin 0,2% - 2 formulas (11,11%); 70% sorbitol solution (20.0%) and sodium saccharin (0,25%) - 2 formulas (11,11%); lavorings: No use of flavorings - 11 formulas (61,11%); red fruit citrus flavor - 2 formulas (11,11%); mint essence - 2 formulas (11,11%); vanilla essence - 1 formula (5,56%); strawberry flavor - 1 formula (5,56%); caramel flavor F-2093 - 1 formula (5,56%).

Discussion

The research objectives were achieved, as it was possible to analyze a diversity of results and as a limitation it was observed the lack of access to complete PDFs for some articles. Alginate and calcium carbonate vehicle in water - good bioavailability and protection of omeprazole in the stomach, but it was an in vitro study(14); Use of sodium bicarbonate as a vehicle - flavor limitations, increased sodium content and compromised efficacy in gastric acid pH. Oral omeprazole suspensions have shown greater efficacy than intravenous pantoprazole in increasing gastric pH, with greater potential to prevent upper gastrointestinal bleeding(15); Sodium bisulfite and parabens: satisfactory physical-chemical and microbiological stability, although there are concerns about adverse reactions to these preservatives; Commercial omeprazole formula: more consistent in terms of concentration of active pharmaceutical ingredients than a traditionally compounded suspension and both formulas demonstrated good

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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Keywords

Omeprazole; Oral Administration; Suspensions; Solutions.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmaceutical Strategies for Managing Intestinal Dysbiosis in Obesity: an Integrative Review

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About this scientific work

DOI: 10.62922/4cbffc.cp109
Link: https://doi.org/10.62922/4cbffc.cp109
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Obesity is a complex chronic condition characterized by excessive body fat accumulation and associated with various metabolic, cardiovascular, and inflammatory complications. Among the diverse consequences of obesity, intestinal dysbiosis has emerged as a significant factor. Intestinal dysbiosis refers to the imbalance in the composition and function of the gut microbiota, which plays a crucial role in digestion, nutrient absorption, and immune regulation (1-3). Recent studies indicate that intestinal dysbiosis can exacerbate the inflammatory state and insulin resistance in obese individuals,

contributing to the worsening of their clinical condition (1,4). Research also shows that obesity can lead to gut microbiota dysbiosis, affecting metabolic variables, retinopathy, nephropathy, and increasing intestinal permeability and inflammation (4). The disruption of the gut microbiota plays a crucial role in the pathogenesis of chronic systemic diseases such as diabetes mellitus, atherosclerosis, and chronic heart failure (1,5-6). In this context, pharmaceutical care becomes a strategic intervention, aiming not only at controlling obesity but also at restoring the balance of the gut microbiota. Personalized digital therapeutic programs with genomic SNPs and gut microbiome markers have demonstrated efficacy in reducing the functional symptomatology of intestinal disorders, including FGIDs, through lifestyle modifications, dietary changes, and weight loss interventions (7-9). Specific interventions, such as the use of probiotics, prebiotics, and synbiotics, have shown potential in modulating the gut microbiota and reducing the systemic inflammation associated with obesity (10). Probiotics, in particular, have been highlighted as a potential intervention to suppress inflammation, protect the intestinal barrier, and improve gut function, which can be beneficial in controlling intestinal dysbiosis associated with obesity and related chronic diseases (11-12).

Aim

This integrative review aims to explore the current evidence on the role of pharmaceutical care in managing intestinal dysbiosis in obese patients, highlighting therapeutic strategies and their clinical impacts. By deepening the understanding of this relationship, this review seeks to contribute to the development of more effective and integrated approaches in the treatment of obesity and its associated complications.

Methods

This integrative review was conducted to analyze the role of pharmaceutical care in intestinal dysbiosis associated with obesity. Initially, we defined the research focus and formulated the central question regarding the influence of pharmaceutical care on managing intestinal dysbiosis in obese patients. Relevant published studies addressing this topic were selected, excluding those that did not meet the criteria or were not directly related to the subject. We conducted a literature search in databases such as Google Scholar, PubMed, Scopus, and Web of Science, using specific terms related to obesity, intestinal dysbiosis, and pharmaceutical care. After identifying the studies, we analyzed them, focusing on therapeutic approaches and their effects on intestinal dysbiosis. The synthesis of the obtained information provided an overview of the relevant pharmaceutical strategies and interventions for managing intestinal dysbiosis associated with obesity.

Results

The review of the studies revealed several effective pharmaceutical approaches in managing intestinal dysbiosis associated with obesity. Among the main interventions, the use of probiotics demonstrated a positive impact on restoring gut microbiota. Lactobacillus and Bifidobacterium were consistently associated with improved microbial composition and reduced inflammatory markers, with additional benefits in reducing intestinal permeability and modulating lipid metabolism (10, 11, 14). Prebiotics,

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

such as inulin and oligosaccharides, also showed efficacy in promoting a healthy gut environment (13). These compounds stimulate the growth of beneficial bacteria, contributing to the alleviation of dysbiosis symptoms and improvement of gut function. Studies indicate that the administration of prebiotics can help balance the microbiota and reduce the adverse effects of obesity (12). In addition to probiotics and prebiotics, synbiotic formulations, which combine probiotics and prebiotics, showed promising results. These combinations enhance the beneficial effects on the gut microbiota and provide additional improvements in gut health and inflammation reduction (7-9). The personalization of interventions based on genomic SNPs and microbiome markers also proved to be an effective approach. Therapeutic programs tailored to the individual characteristics of patients optimize treatment efficacy, highlighting that a personalized approach can significantly improve clinical outcomes in managing intestinal dysbiosis associated with obesity (8, 9). Despite the observed advances, the efficacy of interventions may vary according to the individual profile of patients. Therefore, combining pharmaceutical strategies with lifestyle modifications remains crucial for comprehensive management of intestinal dysbiosis in clinical contexts related to obesity (1).

Discussion

The integrative review highlighted that the use of probiotics, particularly Lactobacillus and Bifidobacterium, has been highly effective in restoring the gut microbiota. These probiotics not only improve microbial composition but also reduce inflammatory markers, playing a vital role in mitigating the chronic inflammation associated with obesity. Additionally, studies have shown that these strains help decrease intestinal permeability and modulate lipid metabolism, which are essential aspects for managing obesity and its metabolic complications (10, 11, 14). In addition to probiotics, prebiotics such as inulin also play a significant role in promoting a healthy gut environment. Inulin has shown efficacy in reducing colonization by pathogens like multi-resistant E. coli through the production of propionate and beta-lactamase activity. This effect is crucial for maintaining microbiota balance and improving gut function, helping mitigate the adverse effects of obesity (13). Furthermore, prebiotics stimulate the growth of beneficial bacteria, balancing the microbiota and alleviating dysbiosis symptoms. This is essential for mitigating the adverse effects of obesity and improving gut function (12). On the other hand, synbiotic formulations, which combine probiotics and prebiotics, have shown additional benefits by enhancing the positive effects on the gut microbiota. These combinations have proven more effective in reducing inflammation and improving gut health than isolated approaches (7-9). The synergy between probiotics and prebiotics can offer a more comprehensive and effective approach to treating intestinal dysbiosis. Moreover, the personalization of interventions using genomic SNPs and microbiome markers has emerged as a promising strategy. Therapeutic programs tailored to individual patient characteristics can optimize treatment efficacy and significantly improve clinical outcomes (8, 9). This personalized approach allows interventions to be adjusted to the specific needs of patients, enhancing the benefits of therapies and promoting more efficient treatment. Despite the advances, the efficacy of interventions may vary according to individual patient profiles. The combination of pharmacological strategies with lifestyle modifications remains crucial for effective management of intestinal dysbiosis. Therefore, an integrated approach that includes personalized pharmacological therapies and lifestyle changes is essential to achieve better clinical outcomes and improve gut health in obese patients (1). This

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

integrative review demonstrated that pharmaceutical approaches, including probiotics, prebiotics, and synbiotic formulations, play a crucial role in managing intestinal dysbiosis related to obesity. Personalized strategies based on genetic and microbiome characteristics are promising and can optimize clinical outcomes. However, the efficacy of interventions may still vary, underscoring the importance of an integrated treatment that combines pharmacological therapies with lifestyle changes. These findings provide a solid foundation for developing more effective and personalized therapeutic approaches for treating intestinal dysbiosis and obesity.

Keywords

Intestinal Dysbiosis; Obesity; Pharmaceutical Care; Probiotics; Prebiotics.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Medication Optimization Strategies for Elderly Patients

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About this scientific work

DOI: 10.62922/4cbffc.cp110
Link: https://doi.org/10.62922/4cbffc.cp110
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 12/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Population aging is a global phenomenon, observed in various regions of the planet. This process results from an increase in life expectancy and a reduction in mortality rates. Consequently, since the 1970s, the proportion of elderly people in the Brazilian population has significantly increased, constituting a challenge for current public health (1). According to the Brazilian Institute of Geography and Statistics (IBGE), it is estimated that by the year 2060, approximately 25% of the Brazilian population will be elderly (2). In the context of human aging, along with increased longevity, significant challenges arise related to the health and well-being of these individuals, therefore, it is crucial to ensure specialized care that includes developments in drug treatment, pharmacovigilance and comprehensive health care for the

elderly. to achieve this, both the public and private sectors need to be prepared to meet the growing geriatric demand, considering that the elderly are the main users of these services due to their greater vulnerability, polypharmacy, higher hospitalization rates and the prevalence of chronic diseases (3). Given this, the role of the pharmacist in this situation is essential in the multidisciplinary team through Pharmaceutical Care (FA), which comprises a set of practices aaimed at promoting the rational use of medicines and improving the results of pharmacotherapy. This concept prioritizes a patient-centered approach, in which the pharmacist plays an active role in healthcare, collaborating with other healthcare professionals and working together with the patient to achieve the best clinical results (4)

Aim

The focus of this work is to explore and develop approaches to improve safety, efficacy and adherence to medication treatment in the elderly, aiming for a better quality of life. This includes identifying pharmaceutical practices that reduce the risks of polypharmacy, drug interactions and adverse events, in addition to adapting therapies to the particularities of the elderly. The goal is to ensure efficient medication management, reducing treatment-related complications in this population.

Methods

This is an integrative review, which aimed to collect data from scientific articles and analyze medication optimization strategies for elderly patients. For this, the following databases were used: Scopus, National Library of Medicine (PubMed/Medline), Virtual Health Library (VHL) and Google Scholar. For the search, the following descriptors were used: “Optimization of pharmacotherapy”, “elderly”, “polypharmacy”. 15 articles dated from the last five years were used. The articles were initially selected from the abstract, with articles that addressed topics related to the research included in the review, in English and Portuguese. Exclusion criteria were considered during the selection of articles: not referring to the theme proposed by the research, not being aligned with the research objectives.

Results

The integrative review included studies that highlight the importance of optimizing pharmacotherapy in the elderly, a population frequently subjected to polypharmacy, as they have a greater number of comorbidities. Specific strategies and evidence-based prescription protocols were adopted to improve the quality of life of these patients, highlighting the numerous benefits that the pharmacist brings to the multidisciplinary team in this context. Polypharmacy is a common practice among elderly patients, many of whom use five or more medications daily. This condition significantly increases the risk of adverse drug effects (ADE), which can result in serious sequelae or even lead to death (5). Estimates indicate that between 13% and 74% of residents in skilled nursing facilities and long-term care environments are on nine or more medications (6). Furthermore, around 59% of patients in SNF/LTC are taking potentially inappropriate medications according to the STOPP/START criteria (7). The Beers Criteria, developed in 1991 by Dr. Mark Beers, identifies medications with more potential harm than benefit for older adults. Initially for nursing home residents, it expanded in 1997 to all older adults. The American Geriatrics Society (AGS) took over updates in 2010, with the latest revision in 2023 marking the

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

seventh update, continuing to flag potentially inappropriate medications for older adults (8). Therefore, guidelines like Beers and STOPP/START criteria identify high-risk medications for older adults and have been proven to prevent adverse drug events (ADEs) and reduce overall healthcare expenditures.

Discussion

The integrative review revealed crucial tools used by pharmacists in pharmaceutical care to optimize medications. Among them, we can mention the review of pharmacotherapy, based on the review of the list of medications and the identification of drug interactions, pharmacists collaborate with the medical team to adjust prescriptions. This process involves the elimination of unnecessary, duplicate medications or those whose risks outweigh the expected benefits, resulting in a rationalization of medications (9). Furthermore, the pharmacist is the professional who has the most contact and in the most accessible and direct way with the patient, therefore, health education must always be carried out for the patient and their caregivers, offering clear and personalized instructions to elderly patients about the appropriate use of prescribed medications, must be instructed on the importance of correctly following the instructions for using the medication, avoiding self-medication. This also includes guidance on dose, administration times and possible side effects, aiming to promote adherence to treatment and prevent drug-related problems (10). Pharmacotherapeutic monitoring is necessary to evaluate the response to drug treatment, that is, effectiveness, enjoying easy and strategic communication with the elderly patient, enabling the rational use of medications, avoiding possible risks of polypharmacy and carrying out interventions when necessary (11). Therapeutic conciliation, especially during transitions of care between hospital and hospital care, has shown to be effective in reducing errors in prescriptions and improving the clarity of therapeutic changes, thus ensuring accuracy in the medication list (12). Personalizing drug therapy for the elderly, taking into account their physiological, pharmacological, cultural and socioeconomic characteristics is crucial to ensure safety, adherence and effectiveness of treatment. Studies have demonstrated that chronological age is not an isolated factor to choose a therapeutic regimen, and it is necessary to consider other clinical and pharmacological variables (13). Thus, age and level of education demonstrated a fundamental role in adherence to the therapeutic regimen. A study carried out in southern Brazil, which evaluated the adherence of individuals aged 60 or over, revealed that around 1/3 of the elderly who used medication were non-adherent to the treatment (14). Therefore, the importance of a comprehensive and multidisciplinary approach in the healthcare of elderly patients, using pharmaceutical care, becomes evident, highlighting its importance in promoting health, preventing adverse events related to the use of medications and improving quality of life, especially in this population (15).

Keywords

Pharmacotherapy; Optimization; Elderly; Polypharmacy.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Importance of Personalized Pharmaceutical Care for Patients with Chronic Diseases

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About this scientific work

DOI: 10.62922/4cbffc.cp111
Link: https://doi.org/10.62922/4cbffc.cp111
Type: Scientific Work.
Area: Pharmacotherapy.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Personalized pharmaceutical care for patients with chronic diseases represents an innovative and essential approach to improving public health. With the increasing prevalence of chronic diseases such as diabetes, hypertension, and cardiovascular diseases, it becomes imperative to enhance care strategies to offer more effective and efficient treatment (1;2). Pharmacists play a crucial role in developing a personalized pharmaceutical care model for patients with chronic diseases, providing services such as medication dispensing, pharmacotherapeutic follow-up, and medication

reconciliation. Through these services, pharmacists can detect and resolve medication-related problems, optimize treatment, and improve health outcomes for patients, especially those with complex medication regimens (3;4). The personalization of pharmaceutical care involves adapting interventions according to each patient's specific needs, taking into account factors such as medical history, comorbidities, individual preferences, and previous responses to treatments. This approach aims not only to optimize clinical outcomes but also to improve patients' quality of life, promoting treatment adherence and minimizing the risks of complications (5;6). The incorporation of health information technologies, such as electronic health record systems and clinical decision support tools, enables more precise and efficient management of patient data. These technologies facilitate continuous monitoring and real-time data analysis, allowing pharmacists to make more informed and personalized decisions (7;8).

Aim

In this integrative review, we will explore how pharmacists can contribute to the improvement of public health through the development of personalized care models for patients with chronic diseases. We will address the advantages and challenges of this approach, highlighting the role of health information technologies and the importance of evidence-based practices.

Methods

In this integrative review, we used a systematic approach to identify and select relevant studies on personalized pharmaceutical care for patients with chronic diseases. The databases consulted included Google Scholar, PubMed, Scopus, Web of Science, and Lilacs, using specific search terms such as "personalized pharmaceutical care," "chronic diseases," "pharmacists," and "health information technologies." We included published studies that addressed personalized pharmaceutical care for patients with chronic diseases and included health outcomes or quality of life indicators. We excluded studies that did not address personalized pharmaceutical care, did not include patients with chronic diseases, or were not published in the specified languages. The selected studies were evaluated for methodological quality, considering the clarity in the description of methods, the adequacy of the statistical methods used, the relevance of the results, and the contribution to pharmaceutical practice. Extracted information was organized and analyzed qualitatively, categorized according to emerging themes such as the benefits of personalized care, challenges in implementation, the impact of health information technologies, and evidence-based practices.
This systematic approach allowed for a comprehensive synthesis of the selected studies, highlighting the most robust evidence and identifying gaps in the literature that require further investigation.

Results

The analyzed studies highlighted significant benefits of personalized pharmaceutical care, including improvements in health outcomes such as reduced complications associated with chronic diseases, hospitalizations, and emergency visits. Patients reported better adherence to treatments and a greater understanding of their conditions and medications, resulting in an enhanced quality of life (9-13).

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

However, the implementation of this care faces notable challenges. The lack of integration and limited interoperability among electronic health record systems were frequently cited as barriers. Additionally, the need for ongoing training of pharmacists to adapt to emerging technologies and evidence-based practices was identified (14-16). The incorporation of health information technologies, such as electronic health record systems and clinical decision support tools, proved crucial for the effectiveness of personalized care. These technologies facilitated continuous patient monitoring and personalized interventions, resulting in more efficient data management and more informed decisions (17-18). The adoption of evidence-based practices was also highlighted. Clinical protocols and guidelines based on the best available scientific evidence resulted in safer and more effective interventions. Pharmacogenomic analysis and therapeutic drug monitoring were identified as important components for the individualization of care (19-20). Collaborative care models involving pharmacists and other healthcare professionals, such as general practitioners and specialists, proved particularly effective. These models promoted a more holistic and integrated approach, resulting in positive perceptions from both patients and professionals. Interprofessional collaboration was associated with better detection and resolution of medication-related problems (21).

Discussion

The results of this integrative review show that personalized pharmaceutical care for patients with chronic diseases brings significant benefits, such as reducing complications, fewer hospitalizations and emergency visits, and increased adherence to treatment (9-13). These findings align with studies that highlight the importance of personalized care in chronic disease management (21). The review by Chisholm-Burns et al. (2010) indicated that the inclusion of pharmacists in the healthcare team improves patients' clinical outcomes (10;22). Similarly, the review by Viswanathan et al. (2012) confirms that interventions to improve treatment adherence, including the active participation of pharmacists, are effective in patients with chronic diseases (11;12). Despite the benefits, the implementation of personalized pharmaceutical care faces challenges, such as the lack of integration and interoperability among electronic health record systems (14-16). This underscores the need to improve technological infrastructure in healthcare to enable a more efficient flow of information. Additionally, the need for continuous training of pharmacists to stay updated with emerging technologies and evidence-based practices was highlighted. The rapid advancement of health technologies requires constant learning to ensure the highest quality of care. The incorporation of health information technologies, such as electronic health record systems and clinical decision support tools, is essential for the effectiveness of personalized pharmaceutical care. These technologies facilitate continuous patient monitoring and allow for more precise personalization of interventions (17-18). However, the integration of these technologies must be accompanied by adequate training for healthcare professionals. The adoption of evidence-based practices was another crucial point highlighted. Clinical protocols and guidelines based on the best scientific evidence resulted in safer and more effective interventions (19-20). Pharmacogenomic analysis and therapeutic drug monitoring are important components for the individualization of care and should be more widely incorporated into clinical practice. Collaborative care models involving pharmacists and other healthcare professionals have proven effective in promoting a holistic and integrated approach to patient care (21). Interprofessional collaboration

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

improves the detection and resolution of medication-related problems and is well-received by patients and healthcare professionals, indicating a promising path for future clinical practice. This study has some limitations. The integrative review is subject to publication and selection biases, potentially emphasizing studies that reported positive outcomes. Additionally, the heterogeneity of the included studies in terms of methods and populations studied may limit the generalizability of the results. Finally, the findings of this review suggest that the implementation of personalized pharmaceutical care should be a priority in health policies. The integration of health information technologies and continuous training of pharmacists are essential to overcome the identified challenges. Future studies should focus on strategies to improve the interoperability of health systems and continuous education programs for pharmacists.

Keywords

Personalized Care; Chronic Diseases; Health Information; Evidence-Based Practices.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Role of the Clinical Pharmacist in the Implementation of Antimicrobial Stewardship Programs

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About this scientific work

DOI: 10.62922/4cbffc.cp112
Link: https://doi.org/10.62922/4cbffc.cp112
Type: Scientific Work.
Area: Public Health.
Received: 02/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Antimicrobial resistance (AMR) is a global-scale problem that has significantly impacted public health (1,2). This situation has led to the worsening of diseases, increased hospitalization times and treatment costs, as well as overloading the healthcare system and increasing mortality rates (3). Annually, about 700,000 deaths are recorded due to this condition, which estimates a cumulative impact of $100 trillion on healthcare services by 2050 if there is no significant change in this scenario (1,4). In this context, this aspect was further aggravated after the COVID-19 pandemic (1,2). In a survey conducted on 2,010

antimicrobial prescriptions made in hospitals during this period, about 72% of them included broad-spectrum antimicrobials, however, only 8% of patients had co-infection with bacteria and fungi (5). This pattern of improper prescription can directly influence the development of AMR, placing the pharmacist in an important scenario for interventions. In light of this, antimicrobial management emerges as a way to relate the rational use of antimicrobials and preserving their effectiveness, while ensuring their continuous availability for those who need them (2). This multidisciplinary approach positions the pharmacist at the center, not only in promoting the rational use of antimicrobials but also in reducing hospital infections and in health education activities.

Aim

This study aims to review the existing literature on antimicrobial resistance (AMR), focusing on the consequences for public health and the challenges faced by healthcare systems globally, highlighting the role of the pharmacist in promoting the rational use of these medications.

Methods

for the review, a search was conducted in electronic databases such as PubMed, Scopus, Web of Science, and SciELO. The following descriptors were used: "antimicrobial resistance," "antimicrobial stewardship," “pharmacist-led,” and "pharmacist role," combined with Boolean operators (AND, OR). The selection was carried out in two stages: reading the titles and abstracts for initial screening, followed by a full-text reading of potentially relevant articles to confirm eligibility. Inclusion criteria included studies published in English, Portuguese, or Spanish, in the last 5 years, open access, that addressed antimicrobial resistance and antimicrobial stewardship strategies by pharmacists. Exclusion criteria included opinion articles, non-systematic reviews, conference abstracts, and studies that do not directly address the proposed topics. Data analysis will be conducted qualitatively, synthesizing the available evidence on the impacts of AMR and management strategies, with a focus on the pharmacist's role.

Results

The adopted parameters returned 57 articles. The most relevant results demonstrated that pharmaceutical stewardship interventions played a crucial role in optimizing antimicrobial use in various aspects and approaches. In hospitalized patients with suspected bacterial co-infection, a high prevalence (30%) of empirical antibiotic treatment was observed. However, pharmacists' interventions resulted in the discontinuation of antimicrobial therapy in 77% of these cases, demonstrating the effectiveness of stewardship actions in this scenario (6). In the outpatient setting, pharmaceutical interventions proved effective in reducing the inappropriate use of antimicrobials for the treatment of acute bacterial rhinosinusitis (7). Additionally, the treatment duration was significantly reduced from 4.6 to 2.6 days after the implementation of the interventions, indicating an optimization of antimicrobial therapy and alignment with clinical guidelines (8). Beyond direct prescription interventions, health education played a fundamental role in pharmaceutical stewardship actions. Through educational activities directed at healthcare professionals and patients, pharmacists promoted awareness about the appropriate use of antimicrobials, the risks of bacterial resistance, and the importance of adherence to

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

treatment. This multifaceted approach contributed to behavior change and the sustainability of stewardship actions in the long term (9). Consistent with the literature, the present findings corroborate the hypothesis that pharmaceutical stewardship interventions can reduce the overall use of antibiotics, associated costs, and the duration of therapy in various hospital settings, including medical wards (10).

Discussion

The results of this study highlight the crucial role of pharmaceutical stewardship interventions in optimizing the use of antimicrobials, both in hospital and outpatient settings. The significant reduction in empirical antibiotic prescribing for hospitalized patients with suspected bacterial co-infection, coupled with the decreased duration of treatment and inappropriate use of antimicrobials in patients with acute bacterial rhinosinusitis, demonstrates the effectiveness of the implemented strategies (8,9). Health education, a fundamental component of stewardship actions, proved essential for behavior change among both professionals and patients. By promoting awareness about the rational use of antimicrobials and the risks of bacterial resistance, pharmacists contributed to the long-term sustainability of the interventions (10). In conclusion, the results of this study demonstrate the relevance of pharmaceutical stewardship interventions in optimizing the use of antimicrobials and preventing bacterial resistance. The combination of direct prescription interventions and educational actions, led by pharmacists, proved effective in reducing the inappropriate use of antibiotics and promoting treatment adherence. However, to ensure the sustainability of these actions, it is crucial to invest in continuous education programs for healthcare professionals, strengthen interprofessional collaboration, and integrate stewardship initiatives into public health policies.

Keywords

Antimicrobial Resistance; Pharmaceutical Intervetions.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Uncontrolled Use of Tadalafil: Risks, Benefits, and Clinical Implications in Young Populations and Athletes

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About this scientific work

DOI: 10.62922/4cbffc.cp113
Link: https://doi.org/10.62922/4cbffc.cp113
Type: Scientific Work.
Area: Public Health.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Tadalafil is a phosphodiesterase type 5 (PDE5) enzyme inhibitor commonly used to treat erectile dysfunction, pulmonary arterial hypertension, and benign prostatic hyperplasia. Inhibition of this enzyme prevents the metabolism of cyclic guanosine monophosphate into its inactive form, prolonging the cellular responses related to this enzyme. Thus, tadalafil can influence cellular physiology and the metabolic pathways of skeletal muscle, modulating responses related to protein catabolism and anabolism (1). In this context, due to increased accessibility, the consumption of tadalafil has grown significantly, especially among younger populations who opt for self-medication without a necessary therapeutic indication. However, the practice of self-medication does not take into account the long-term risks and adverse effects that PDE5 inhibitors may cause (5). Additionally, there has been an observed use of tadalafil as a pre-workout supplement for those engaging in physical activities. This use is not properly validated for tadalafil and is not listed in the medication's prescribing information.

Aim

To review literature studies that correlate tadalafil as a pre-workout compound, emphasizing potential risks and consequences.

Methods

An integrative and exploratory qualitative literature review was conducted, using scientific articles available in databases such as PubMed, LILACS, Scielo, and Google Scholar. Descriptors used included: "tadalafil," "physical exercise," "self-medication," and "risk." Studies from the last 10 years were selected.

Results

Few studies on tadalafil and its potential benefits to sports were found. Tadalafil may provide beneficial effects, particularly on body composition in non-obese men, increasing lean abdominal mass and improving endothelial function, as well as hormonal balance. Additionally, there is widespread dissemination by digital content creators, claiming that the use of PDE5 inhibitors enhances athletic performance, without necessarily specifying which sports (6). This drug can offer a protective effect against oxidative stress that may be generated during physical exercise, preventing tissue injury. However, when assessing long-term exposure to tadalafil combined with exhaustive exercise, a decrease in antioxidant capacity at rest is observed, making individuals more susceptible to oxidative stress (3). Furthermore, the indiscriminate and prolonged use of tadalafil and other medications in this class can lead to gradual loss of vision and hearing, risk of cerebrovascular hemorrhage, psychological dependence, and, in some cases, trigger disorders such as depression (4).

Discussion

The results of this study reveal a complex and multifaceted landscape regarding the use of tadalafil, especially in contexts outside its traditional clinical indication. While widely recognized for its beneficial effects, particularly in treating erectile dysfunction, there is growing popularity of non-therapeutic use of tadalafil, driven by social media (2). This phenomenon is particularly concerning among young people seeking to improve athletic performance, often without considering the associated risks. Clinically, the use of tadalafil outside of approved indications presents significant risks, with considerable undesirable effects, including psychological dependence (7). Moreover, prolonged exposure to tadalafil during strenuous exercise may increase oxidative stress and impair muscle function. Given these findings, it is crucial for healthcare professionals and pharmacists to be well-informed about the risks associated with the indiscriminate use of tadalafil and to be equipped to communicate these risks to patients. Educational campaigns are essential to inform the public about the dangers of self-medication and unauthorized use of medications. Healthcare professionals should closely monitor patients using tadalafil, especially those at risk of misuse or with health conditions that could be exacerbated by the drug. Regulatory health authorities should reinforce monitoring over the sale of medications like tadalafil, ensuring its use is limited to approved clinical indications and legitimate prescriptions. There is an urgent need for more robust studies investigating the long-term effects of tadalafil, particularly in young people and athletes. Future research should explore the mechanisms by which tadalafil may influence oxidative stress and other metabolic pathways, providing a more solid basis for clinical guidelines. Tadalafil presents well-established clinical benefits, but its indiscriminate and poorly informed use can lead to significant adverse consequences. No studies were found that validated the

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

indication of this drug for athletes. Awareness and education are crucial to protecting public health, and a multidisciplinary approach is necessary to address these challenges.

Keywords

Erectile Dysfunction; off-Label Use; Drug.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Influence of Selective Serotonin Reuptake Inhibitors Drugs on Libido

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About this scientific work

DOI: 10.62922/4cbffc.cp114
Link: https://doi.org/10.62922/4cbffc.cp114
Type: Scientific Work.
Area: Public Health.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Selective serotonin reuptake inhibitors (SSRI) are a class of antidepressant/anxiolytic drugs used to treat depression, anxiety, and other psychopathologies. Their mechanism of action involves blocking the reuptake of serotonin in the brain, thereby increasing the concentration of this neurotransmitter in the central nervous system (1). Serotonin regulates mood, sleep, and appetite, and alterations in its levels can lead to side effects on sexual function, reflecting its role in regulating this physiological function (2). The effect of SSRIs on libido should be considered by health professionals when prescribing pharmacotherapy. Therefore, it is important to identify which SSRIs decrease libido and how they influence patients' quality of life, as well as to understand the aspects related to this effect.

Aim

To review the literature on SSRI drugs that influence libido reduction, with the aim of raising awareness among health professionals.

Methods

An integrative review was carried out to answer the following guiding question: “Which SSRI drugs decrease libido?” to this end, we used the Medline/PubMed, Scopus, Web of Science and CAPES journals databases, using the descriptors “Selective serotonin reuptake inhibitors” and “libido”, selecting articles published in Portuguese, Spanish and English over a 10-year period (2014-2024) that addressed the influence of SSRIs on libido. Studies that did not meet all the eligibility criteria were excluded.

Results

Initially, 74 studies were found in the databases consulted. After screening, 22 articles did not go on to the next stage because they were duplicates. Of the remaining 52, 24 were chosen by title and abstract. Of these, 15 were read in full and 9 articles were selected to answer the guiding question. According to the papers, the drugs fluoxetine, citalopram, escitalopram, paroxetine, sertraline and fluvoxamine are SSRIs and reduce libido in men and women (3, 4, 5, 6, 7). This effect can be explained by the fact that they cause high concentrations of serotonin, reducing dopamine and noradrenaline levels, decreasing sexual function, as well as reducing nitric oxide production. In addition, they cause anticholinergic effects, inducing low libido and erectile dysfunction (8).

Discussion

Sexual dysfunction can significantly impact quality of life, marital and family relationships, and self-esteem. It can also lead to issues with adherence to pharmacological treatment and exacerbate symptoms (9). Studies indicate that 60-70% of patients experience sexual problems related to SSRI treatment. While many treatment-related side effects disappear upon discontinuation, in some cases, sexual dysfunction can persist even after stopping the medication (10). Excessive activation of serotonin receptors has been linked to sexual side effects, where the modulation of these receptors can negatively influence sexual function. Additionally, serotonin can increase pituitary prolactin levels, decreasing sexual desire. Other contributing factors include anticholinergic effects, inhibition of nitric oxide synthesis, and interference with the emotional memory circuit related to sexual activities (11). For patients with sexual dysfunction associated with SSRI use, several management strategies can be suggested. These include adjusting the dosage, reducing the SSRI dose to mitigate sexual side effects, replacing SSRIs with antidepressants/anxiolytics that are less likely to cause sexual dysfunction, and adding medications such as bupropion to increase libido (12). Nonpharmacological approaches, such as sex therapy and counseling, may also be useful in helping patients cope with sexual side effects (13). Although SSRIs are highly effective in the treatment of various mental conditions, their sexual side effects can be significant and interfere with patients' pharmacotherapy. It is essential that healthcare professionals discuss these potential side effects with patients before starting treatment and regularly monitor sexual function throughout therapy. Strategies for dealing with these side effects should be individualized, guided by the severity of the symptoms, the effectiveness of the treatment and the patient's preferences.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Sexual Behavior; Adverse Reactions; Fluoxetine.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Epidemiological Analysis of Drug Intoxications Occurring in the Municipality of Valparaíso De Goiás, Goias, Brazil

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About this scientific work

DOI: 10.62922/4cbffc.cp115
Link: https://doi.org/10.62922/4cbffc.cp115
Type: Scientific Work.
Area: Public Health.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Medications are the primary toxic agents associated with exogenous intoxications in Brazil (1). Drug intoxications represent a significant issue in the public health context (2), characterized by their high prevalence and substantial impacts on morbidity and mortality (3). The state of Goias reports substantial numbers of drug intoxication notifications (4). This situation is exacerbated by the scarcity of specific studies addressing the individual realities of municipalities such as Valparaíso de Goiás. The lack of local epidemiological data limits the implementation of targeted interventions, hindering the

development of preventive and therapeutic strategies that address the particularities of this community. In this context, the role of the pharmacist becomes essential, both in the surveillance and prevention of these intoxications and in the promotion of rational medication use (5).

Aim

Investigate the epidemiological profile of exogenous drug intoxication notifications recorded in the municipality of Valparaíso de Goiás, Goias, Brazil.

Methods

This is a documental, retrospective, descriptive research with a quantitative approach. Cases of exogenous drug intoxication were collected from the Department of Informatics of the Unified Health System (DATASUS) via access to the Notification of Diseases Information System (SINAN). The studied variables included the municipality of notification (Valparaíso de Goiás), toxic agent (medication), year, sex, age group, circumstance of intoxication, type of exposure, confirmation criteria, and case outcomes. The study encompassed a total of 392 records of exogenous drug intoxication in the municipality of Valparaíso de Goias, Goias, Brazil. Descriptive analyses were conducted using Microsoft Excel 2016® software.

Results

A gradual increase in the number of notifications was observed over the years, with a peak in 2022 (n=130; 33.08%) and a significant decline in 2023 (n=25; 6.36%). Data reveal that the majority of cases were female (n=307; 78.28%) and, to a lesser extent, male (n=37; 9.43%). Suicide attempts were the primary cause of drug intoxications (n=361; 92.11%). The most affected age group was 20-39 years (n=202; 51.51%), representing over half of the records. This was followed by the age groups 15-19 years (n=92; 23.47%) and 40-59 years (n=52; 13.27%). The most frequently recorded type of exposure was acute–single (n=288; 73.47%), followed by acute–repeated (n=71; 18.14%). In most cases, confirmation of drug intoxication was based on the clinical evaluation of the patient (n=311; 79.33%), followed by clinical-epidemiological assessment (n=51; 13.02%). The main outcome observed in this study was recovery without sequelae (n=308; 78.57%).

Discussion

The reduction in the number of reported cases in 2023 may be attributed to underreporting, which could obscure the true extent of the issue, given that the study relies solely on reported cases and not the total number of actual cases (6). The predominance of poisonings among females may reflect differences in medication usage patterns between genders, as women are more likely to self-medicate compared to men (7), in addition to potential social and cultural factors influencing the prevalence of these poisonings (8). The age group most affected by medication poisoning reflects common mental health issues such as stress, insomnia, anxiety, and depression, which often require pharmacological treatment. During episodes of suicidal ideation, individuals may intentionally increase medication doses, which can heighten the risk of poisoning (9). Several studies identify suicide attempts as the

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

primary cause of medication poisoning, highlighting the need for effective prevention and intervention strategies to address the elevated risk of poisoning in individuals with suicidal ideation (10, 11, 12). Although SINAN does not provide details on the classes of medications, studies indicate that anxiolytics, antidepressants, hypnotics, and antiepileptics are frequently used in these situations (13, 14, 15). Another important aspect is that the type of exposure can influence the severity of the poisoning. In this study, the predominance of acute-single exposures suggests that most poisonings result from a single episode, often associated with intentional or accidental medication use (16). The urgency of initiating treatment reinforces the use of clinical criteria for case confirmation. While each medication requires specific management, initial supportive measures are crucial and should be applied immediately to stabilize the patient (17). Given that most cases resulted from suicide attempts, the outcome of recovery without sequelae highlights the effectiveness of the interventions performed. However, it is essential that treatment does not conclude prematurely, and continuous psychological follow-up is recommended for individuals with previous attempts, due to the high risk of new self-harm (18). The investigation provided a detailed understanding of the epidemiological profile of drug intoxications reported in the municipality of Valparaíso de Goiás, Goiás State. The data revealed that the majority of cases occurred in 2022, predominantly affecting females and individuals aged 20 to 39 years. The primary cause of intoxications was suicide attempts, with the exposure being predominantly acute-single. Case confirmation was primarily conducted through clinical evaluation, and the most frequent final outcome was recovery without sequelae. Given the observed epidemiological profile, it is evident that there is a need to implement municipal public policies focused on awareness campaigns about rational medication use and social support programs for at-risk individuals, which could help reduce the occurrence of drug intoxications. Furthermore, prescribers should conduct careful patient assessments before initiating treatments with psychotropic drugs, as these medications are frequently associated with suicide attempts. The pharmacist should be integrated into the multidisciplinary team, contributing to the implementation of prevention and treatment strategies, promoting mental health, and ensuring patient safety.

Keywords

Poisoning; Pharmacoepidemiology; Public Health.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Consumption of Benzodiazepines in a Polyclinic in the Metropolitan Area of Recife: a Retrospective Study

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About this scientific work

DOI: 10.62922/4cbffc.cp116
Link: https://doi.org/10.62922/4cbffc.cp116
Type: Scientific Work.
Area: Public Health.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The objective of this study was analyzing the effectiveness of Pharmaceutical Servies and Policies for patients with type 2 diabetes mellitus (DM2) using insulin, treated in a municipality in the State of Parana, which does not have commercial pharmacies and private clinics, so that all inhabitants are served by the Unified Health System (SUS).

Aim

The study aims to identify and quantify the main benzodiazepines dispensed to users at a Polyclinic with a Family Pharmacy in the city of Recife. Additionally, it seeks to identify and observe the situations that lead to the need for these medications and to jointly develop strategies to minimize the problems associated with their use.

Methods

This is a retrospective study on benzodiazepine consumption, using secondary data from the Hórus/Recife System. Data collection was carried out at a municipal public pharmacy located in a polyclinic in the metropolitan region of Recife, Pernambuco. The instrument used for data collection was the HÓRUS/Recife system implemented in the Municipal Health Network Pharmacies. Reports were generated through the system, obtaining data on prescriptions for benzodiazepine medications dispensed by the municipality from January 1, 2023, to December 31, 2023. For the purposes of this study, the benzodiazepines considered were those available in the Municipal Drug List (REMUME), which included clonazepam 0.5 mg, clonazepam 2 mg, clonazepam 2.5 mg/ml, diazepam 5 mg, diazepam 10 mg, and lorazepam 2 mg. The collected data included: types of medications, quantities of medications dispensed, number of patients, and average consumption of the medications. The obtained data were transcribed into Excel spreadsheets, version 2010.

Results

From January 2023 to December 2023, there were 2,446,169 benzodiazepine medication dispensations by the mental health program of the Recife-PE health unit for 1,692 patients. According to the Hórus system reports, clonazepam 2 mg was the most dispensed medication, totaling 1,347 patients, which corresponds to 79.6% of benzodiazepine dispensations. This was followed by diazepam 10 mg, with 338 patients, representing 20% of dispensations, and lorazepam 2 mg, with 7 patients, representing 0.4% of the total patients. Regarding gender, there was a prevalence of females, totaling 1,108 patients (59.6%), with the highest consumption of clonazepam at 899 patients (66.8%), followed by diazepam at 204 patients (60.4%) and lorazepam at 5 patients (71.5%). Benzodiazepine consumption was predominantly observed in patients aged 20 to 59 years, totaling 927 patients (37.9%), with clonazepam at 745 patients (55.6%), followed by diazepam at 178 patients (52.7%) and lorazepam at 4 patients (57.2%). Patients over 60 years constituted the second largest group of benzodiazepine users, averaging 30.7% of users: 30.6% used clonazepam 2 mg, 31.5% used diazepam 10 mg, and 30% used lorazepam 2 mg. The pediatric population was the smallest consumer, accounting for less than 1% of users: 0.4% used clonazepam 2 mg, 0.8% used diazepam 10 mg, and 0% used lorazepam 2 mg. In terms of monthly medication consumption, clonazepam 2 mg was the most used active ingredient, with a total of 20,042.8767 tablets consumed in 2023, followed by diazepam 10 mg with a monthly consumption of 5,104.5206 tablets. Lorazepam 2 mg was the least consumed, with 60.8219 tablets per month.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

During the study period, clonazepam 2 mg, diazepam 10 mg, and lorazepam 2 mg were predominantly used at the analyzed health unit, despite other concentrations of these medications being listed in the REMUME. The predominance of female patients in benzodiazepine dispensations at the unit aligns with the literature. A study conducted in drugstores and private pharmacies in Belém-PA indicated that 81.7% of dispensations between 2020 and 2022 were for females (6). This data may be related to cultural and social factors, as well as women's greater attention to their mental health (6-7). Several reasons contribute to women leading in benzodiazepine use rates, including attempts to escape personal problems, sleep disturbances, and depressive symptoms (8). Historically, women face disadvantages compared to men, and this burden directly impacts their mental and physical health. Additionally, women generally have more concern for health than men (7-8). These findings support other epidemiological research indicating that benzodiazepines are among the most prescribed medications for the elderly, with higher usage prevalence among women, especially for treating insomnia and anxiety disorders. With the aging Brazilian population and the consequent rise in diseases, sleep disorders, and anxiety, there is a growing use of various classes of medications, including benzodiazepines (9). The indiscriminate use of benzodiazepines has been recognized as a public health problem for decades, primarily due to their use over long periods and in inappropriate situations. Benzodiazepines are among the five most commonly controlled medications sold in Brazil, with higher consumption in densely populated regions and areas with a greater number of doctors. Their sedative effects, which improve sleep quality, require special attention in prescribing due to risks of adverse events and dependency (10). The study's results emphasize the importance of public actions to identify social needs, particularly given the higher use among women over 50 years old. It also highlights the significance of including pharmacists in multidisciplinary teams to help identify issues related to the indiscriminate use of benzodiazepines and to collaborate with other professionals to find solutions.

Keywords

Benzodiazepine; Pharmaceutical Services and Policies; Multidisciplinary Team.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Analysis of the Influence of Bacterial Resistance Resulting From the Irrational Use of Antibiotics as an Aggravating Factor for Sepsis

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About this scientific work

DOI: 10.62922/4cbffc.cp117
Link: https://doi.org/10.62922/4cbffc.cp117
Type: Scientific Work.
Area: Public Health.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Sepsis consists of systemic inflammation, which occurs when the body responds in an exacerbated way to an infection, whether caused by viruses, fungi, or especially bacteria1. If it is not treated properly, it can develop into a more serious condition, such as septic shock, leading to death due to multiple organ failure2. Linked to this issue, bacterial resistance has a strong influence on the worsening of sepsis, since if a microorganism causing sepsis does not respond to a drug, it implies non-adherence to

treatment. According to the World Health Organization (WHO), gram-negative bacteria are the main ones to show resistance to multiple antibiotics, such as Klebsiella pneumoniae, Helicobacter pylori, Neisseria gonorrhoeae, Escherichia coli and Salmonella spp. However, gram-positive bacteria also show resistance, such as Staphylococcus aureus. The emergence of antimicrobial resistance (AMR) is a biological and natural process that occurs after the implementation of antimicrobial therapy3. Among the causes of bacterial resistance, the main one is the excessive consumption of antimicrobials, which increases the selective pressure in favor of pharmacoresistant microorganisms, and it is important to know the proper use of this class of drugs for successful therapy according to an adequate dosage to fight the infection and inhibit bacterial growth4. Antibiotic prescription errors occur in the selection and duration of treatment, and are one of the main points to be readjusted for the rational use of drugs, seeking not only to cure the patient, but also to avoid the emergence of resistant bacteria, since there is the ability of several bacteria to evade the aggressive mechanisms of antimicrobials, caused and aggravated by the inappropriate use of this class of drugs5.

Aim

To verify the influence of bacterial resistance, resulting from the irrational use of antibiotics, as an aggravating factor in the development and treatment of sepsis, and its impact on clinical intervention.

Methods

This study followed a literature review approach, using the PubMed, VHL, SciELO and Google Scholar databases. Free scientific articles were selected using the keywords "Bacterial resistance", "Sepsis" and "Irrational use of antibiotics". The search included articles in English and Portuguese, published between 2004 and 2023. The articles were selected and analyzed taking into account the relevance and quality of the studies available on these platforms.

Results

The literature highlights that sepsis caused by bacteria is among the most prevalent comorbidities affecting hospitalized patients, since they are characterized as easily disseminated microorganisms and have a high rate of mutagenesis, a mechanism by which they can acquire resistance. The resistance of the etiological agent is presumed to be a relevant factor in the determination of sepsis, the main cause of which is the widespread presence of bacterial multidrug resistance in the hospital environment1. The global report on antimicrobial resistance and antimicrobial use surveillance system (GLASS), published by the WHO, shows high levels of resistance to bacteria frequently associated with hospital sepsis. According to the report, the data shows that more than 60% of the Neisseria gonorrhoeae strains isolated were resistant to ciprofloxacin; more than 20% of the Escherichia coli strains were resistant to first-line (ampicillin and co-trimoxazole) and second-line (fluoroquinolones) drugs; above 50% levels of resistance, it is reported that bacteria are often associated with hospital sepsis, such as Klebsiella pneumoniae, and that 8% of cases of infection resulting in sepsis caused by Klebsiella pneumoniae showed resistance to carbapenems; Staphylococcus aureus is resistant to methicillin and poorly sensitive to vancomycin3. It is evident and alarming that common infections caused by these bacteria

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

are already resistant to currently available drugs, which poses a threat to the global health of humanity, since according to WHO data, approximately six million people die annually due to inadequate access to antibiotics, including one million children who die from preventable generalized infection (sepsis or septicemia) and pneumonia6.

Discussion

Bacterial resistance is a global impasse that puts millions of lives at risk by increasing the possibility of death from an untreatable infection. Its emergence is not only due to the mutagenic potential of these microorganisms, but also includes the irrational use of antibiotics as an aggravating factor. Resistant bacteria make clinical intervention even more difficult for patients, since the need to combine drugs makes treatment more complex7. WHO data shows that bacteria that cause common infections are becoming more resistant, leading to sepsis, which is notable for its severity and incidence in hospitals. Therefore, the inappropriate use of antibiotics is an approach that should be discussed and analyzed at the global health parameter level, seeking interventional monitoring measures in order to establish rational use aimed at maximizing therapeutic activity, improving patient safety and minimizing risks, as well as guaranteeing the drug's efficacy, since without an intervention policy that changes the irrational way people use antibiotics, new drugs will follow the same fate as current ones, becoming equally ineffective6. In view of the declining efficacy of once effective antibiotics and the increased selection of multi-resistant strains, this scenario represents a future risk, accompanied by the possible return of the pre-antibiotic era, making individuals even more vulnerable to acquiring a generalized infection by microorganisms that cause common infections, and resulting in increased mortality (8,9).

Keywords

Bacterial Resistance; Antibiotics; Sepsis.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Mapping Notified Cases of Leptospirosis in the State of Riogrande Do Sul From May to June 2024: the Impact of Floods Onthe Proliferation of the Disease

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About this scientific work

DOI: 10.62922/4cbffc.cp118
Link: https://doi.org/10.62922/4cbffc.cp118
Type: Scientific Work.
Area: Public Health.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Leptospirosis is an infectious, febrile and endemic disease, considered to be a zoonosis, transmitted by direct or indirect exposure to the urine of certain animals, especially rats, that are infected with the bacterium of the genus Leptospira, which are considered to be reservoirs of the disease1.The bacterium penetrates the individual from the mucous membranes or the skin, whether it is damaged or in its entirety, and which has been submerged in contaminated water for long periods of time2. The

occurrence of leptospirosis is related to unstable sanitary infrastructure conditions, high infestation of rodents that are infected and, in cases such as flooding, the spread and even persistence of the causative bacteria in the environment, favoring the occurrence of outbreaks1,3. Leptospirosis cases are reported in all the states of the federation, but there are more cases in the south and southeast. 3 the accumulated rainfall from April 26 to May 5, 2024 in the state of Rio Grande do Sul raised the level of the Guaíba River to around 5.35 meters4. This high volume of rainfall caused several regions of the state to be flooded and, consequently, increased the risk of leptospirosis in the local population. This situation can be verified by looking at the reports on the detection of new cases in the locality during this period.

Aim

To carry out a survey on the distribution of leptospirosis case notifications from May to June 2024 in the state of Rio Grande do Sul, where a favorable environment has been created for the proliferation of the disease in the midst of the floods that hit the state.

Methods

This is a cross-sectional study with a quantitative approach, carried out through descriptive research, based on a bibliographic survey, through the analysis of articles published on the SciELO and Google Scholar platforms. Data was collected from May to June 2024 from epidemiological bulletins issued and registered on the website of the Rio Grande do Sul Health Department, using a form from the State Health Surveillance Center (CEVS/SES-RS). as the data used is secondary and therefore in the public domain, it was not necessary to obtain approval from the Research Ethics Committee.

Results

Counting leptospirosis cases, a total of 6520 notified cases were identified in the state of Rio Grande do Sul, referring to the collection period dated 26/04/2024 to 03/07/2024. Of the notified cases, 546 (8.4%) are confirmed cases, 2156 (33.1%) are discarded cases and 3811 (58.5%) are under investigation. The notified cases are distributed across the state in the municipalities of Porto Alegre (1845 notifications), Canoas (637), São Leopoldo (346), Novo Hamburgo (315), Sapucaia do Sul(285), Alvorada (282), Igrejinha (177), Viamão (140), Venâncio Aires (120), Santa Cruz do Sul (117), Esteio (112), Gravataí (109), Rio Grande (95), Estrela (93), Guaíba (90), Lajeado (88), Três Coroas (83), Eldorado do Sul (72), Montenegro (66), Cachoeirinha (63), Pelotas (59) and Santa Maria (55)5.

Discussion

Climate change can lead to extreme events such as storms and floods6. Thus, the results suggest a link between the reported cases of leptospirosis and the environmental disaster thatoccurred in the state of Rio Grande do Sul, given the emergence of a place with favorable characteristics for the transmission of leptospirosis, which is a water-borne disease. It should also be noted that some of these municipalities, which had high numbers of notifications, such as Porto Alegre and Canoas, are justified by their high population density, which has contributed to the significant number of cases, since rat infestation is aggravated by the disorderly growth of the urban area, as well as the fact that they are located near the

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Guaíba River, where the level of its waters has exceeded its limits, resulting in the flooding of municipalities in the state. Thus, although leptospirosis is an endemic disease, episodes of flooding, especially like the one that occurred during this period of public calamity faced by Rio Grande do Sul, increase the risk of infection, which can be seen from the spread of the disease in the state7.

Keywords

Leptospirose; Rio Grande Do Sul; Floods.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Access to Medications for Adults with Cystic Fibrosis Under the Care of a Reference Center in Southern Brazil

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About this scientific work

DOI: 10.62922/4cbffc.cp119
Link: https://doi.org/10.62922/4cbffc.cp119
Type: Scientific Work.
Area: Public Health.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

In cystic fibrosis, a multisystemic disease, which is responsible for the highest morbidity and mortality rates. The first line of pulmonary therapy includes mucolytics and antibiotics (1,2). Respiratory tract infections are common in individuals with CF, and their management still involves heterogeneous strategies (3). A pharmaceutical services takes on a fundamental role in access to medications and effectiveness of treatment in cystic fibrosis (4,5). In Brazil, medications for CF treatment are funded by the Ministry of Health and others by State Health Departments.

Aim

To identify the profile of adult patients with CF and their access to medications provided by the public healthcare system and used for CF treatment.

Methods

The data collection was conducted through interviews using a standardized questionnaire developed by the researcher, addressing access in the last year to pancreatic enzymes, ADEK complex vitamins, ursodeoxycholic acid, inhaled dornase alfa, inhaled tobramycin, inhaled sodium colistimethate, and azithromycin. Access was classified as full access, partial access or no access to the medications, and

the reason reported for no access or partial access was verified. The study was approved by the Ethics and Research Committee number 2020-0658 and CAAE 40645 820.5.0000.5327.

Ethics
The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

of the 65 patients included in the study, 38 (58.5%) were female and 27 (41.5%) were male, 64 (98.5%) were of caucasian ethnicity and the mean age was 28.2 ± 9.8 years. The median age at CF diagnosis was 1.4 years and 47 (72.3%) carried the F508del variant (13 homozygous and 34 heterozygous). The mean BMI was 22.2 ± 3.4 kg/m2. Analysis of patient self-reports regarding access to specific CF treatment medications showed that 15 patients (23%) reported having full access to the medications, while 47 patients (72%) reported having partial access, and 3 (5%) reported not having access to at least one of the medications. Fifty-one patients (72.5%) reported having difficulty accessing at least one of the medications through the public healthcare system. Among the medications, inhaled sodium colistimethate and the DEKAS multivitamin were the most commonly mentioned in terms of difficulty accessing, followed by inhaled dornase alfa and inhaled tobramycin.

Discussion

The increase in survival and quality of life observed in CF patients over the past decades has been proportionally associated with the increase in the number of medications used for the disease (4). The main reported reason for this difficulty in accessing medications was the delay in distribution or lack of medication in the state pharmacy. Comparing to American patients, brazilians have less access to therapy, consequently impacting poorer nutritional indices and pulmonary function (6). Thus, access to medications and polypharmacy are concerning aspects in the treatment routine. The results suggest the need for strategies to optimize stock management in the public healthcare system and monitoring pharmacotherapy according to clinical protocols and therapeutic guidelines (7).

Keywords

Cystic Fibrosis; Pharmaceutical Services.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Suicide Attempts By Drug Intoxication During the Covid-19 Pandemic in the State of Paraíba, Brazil, From 2020 to 2022

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About this scientific work

DOI: 10.62922/4cbffc.cp120
Link: https://doi.org/10.62922/4cbffc.cp120
Type: Scientific Work.
Area: Public Health.
Received: 28/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Suicide, characterized by self-inflicted violence with the clear intention of causing one's own death, presents significant global prevalence and incidence rates, especially during the COVID-19 pandemic (1). One of the most common methods of suicide attempt is deliberate drug ingestion (2).

Aim

This study aims to analyze the epidemiological profile of suicide attempts using medications in the State of Paraíba during the COVID-19 pandemic, covering the years 2020 to 2022.

Methods

An epidemiological and descriptive study was conducted using data from the Notifiable Diseases Information System (SINAN) (3). Information on drug-related intoxications occurring between 2020 and 2022 was analyzed, considering variables such as year, gender, age group, skin color, education level, and clinical outcome. Frequencies, relative frequencies, adjusted residuals, Phi, Cramér's V, and the Contingency Coefficient were calculated. Additionally, the Chi-Square Test of Independence was used, with $p<0.05$ considered statistically significant and adjusted residuals (r).

Results

According to SINAN records, there were 2,924 reported cases of drug intoxication related to suicide attempts during the COVID-19 pandemic, with 2022 being the most prevalent year in Paraíba (n=1,284), followed by 2021 (n=949) and 2020 (n=691). The profile of intoxications was predominantly female (80%), with the most commonly affected age group being 20 to 39 years (n=1,512), followed by 15 to 19 years (n=615), 40 to 59 years (n=465), 10 to 14 years (n=226), up to 9 years (n=54), 60 to 64 years (n=30), 65 to 69 years (n=12), 70 to 79 years (n=9), and over 80 years (n=1). There was a statistical association between gender and age group (p=0.001), with positivity for females up to 19 years (r=13.0) and males aged 20 to 59 years (r=12.1) and over 60 years (r=2.2); Phi and Cramér's V were equivalent to 0.273, while the Contingency Coefficient was 0.240. Regarding education level, the most common was medium education (18%), followed by low education (11.9%), high education (5%), and no education (0.1%), although 65% of the cases had this data ignored. Furthermore, there was higher prevalence among mixed-race individuals (80%), followed by white (8%), black (2%), yellow (0.71%), and indigenous (0.29%); 9% of the cases had this information ignored. Concerning clinical outcomes, most intoxications resulted in recovery without sequelae (80%), followed by loss of body part (1.1%), recovery with sequelae (1.0%), death from drug intoxication (0.6%), and death from other causes (0.1%); 17.2% were ignored.

Discussion

The number of suicide attempts increased over the years of the pandemic, which may be related to extended social isolation and greater exposure to tragic news and events. This contributes to mental health deterioration and the emergence of conditions like depression and anxiety, which, in turn, contribute to the increased prevalence and incidence of suicide attempts (4). Moreover, it is observed that women were the most frequent in suicide attempts, related to the fact that females tend to use medications for suicide, whereas males opt for firearms and hanging (5). Regarding ethnicity, mixed-race individuals are more commonly affected due to their majority status in the state of Paraíba, as well as socioeconomic difficulties faced during the COVID-19 pandemic. Education level was predominantly medium among suicide attempts, which is an interesting finding, as individuals with this level of

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

education have some knowledge of medications, potentially facilitating the execution of suicide attempts (6). Regarding clinical outcomes, although there were a small number of deaths, it is a concerning finding as these patients may attempt suicide again, impacting their own health and that of their families, as well as increasing public health expenses related to hospitalization and medications (6). Therefore, awareness of risk factors and promotion of access to mental health services are essential to mitigate the negative impacts on public health and prevent suicide-related tragedies.

Keywords

Suicide; Medications; Covid-19.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Evaluation of Cytokine Profile, Hla Typing Related to Skin Reactions to Benznidazole in Patients with Chagas Disease

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About this scientific work

DOI: 10.62922/4cbffc.cp121
Link: https://doi.org/10.62922/4cbffc.cp121
Type: Scientific Work.
Area: Public Health.
Received: 28/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Chagas disease (CD), caused by the protozoan Trypanosoma cruzi, affects millions of people primarily in Latin America. CD manifests in two forms: acute and chronic. The acute form can be asymptomatic or present mild symptoms, while the chronic form can lead to serious complications, mainly cardiac and digestive, becoming a significant public health concern (1). The current treatment for CD is the drug Benznidazole (BNZ), which, although effective, can cause adverse drug reactions (ADR), leading to the interruption of treatment in some cases (2). Investigating the influence of BNZ on the level of pro-inflammatory cytokines, associated ADRs, and the presence of genetic polymorphisms in interferon regulatory factors (IRF) is crucial for improving the understanding and treatment of CD (3).

Aim

The objective of this study was to evaluate the influence of Benznidazole on pro-inflammatory cytokine levels, identify ADRs associated with the treatment, and investigate the presence of genetic polymorphisms in interferon regulatory factors (IRF) in CD patients.

Methods

This prospective study was conducted with CD patients who underwent treatment with BNZ at the Chagas Disease Research Laboratory (LPDC). Data collection included patient interviews, analysis of medical records, and laboratory and serological tests to evaluate ADRs. Levels of pro-inflammatory cytokines, especially interferon-gamma (IFN-γ), were measured before, during, and after treatment. Additionally, genetic polymorphisms in interferon regulatory factors, such as IRF8, were analyzed to correlate with cytokine levels and the occurrence of ADRs.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

The majority of patients treated at the LPDC were men (51%), from the interior of Ceará, and with low educational attainment. During treatment with BNZ, 36 patients (73.4%) experienced ADRs, most of which were classified as possible or probable causality, with mild to moderate severity. The analysis of cytokine levels did not show a statistically significant difference in interferon levels before, during, and after treatment. However, one month after the start of treatment, a relationship was observed between higher interferon levels and a greater frequency of ADRs, as well as higher levels of this marker in patients with more severe forms of CD. Furthermore, the rs10514611 polymorphism of IRF8 showed that the wild-type genotype was associated with lower levels of IFN-γ. These results suggest that the interferon-mediated inflammatory response may influence both the efficacy and tolerability of BNZ treatment.

Discussion

The high prevalence of ADRs observed in this study underscores a significant issue in the management of CD with BNZ. While most ADRs were classified as having possible or probable causality and were of mild to moderate severity, their occurrence still poses a challenge (4, 5). The relationship between higher levels of interferon-gamma (IFN-γ) and a greater frequency of ADRs suggests that inflammation plays a role in the development of these reactions. This finding aligns with existing literature indicating that inflammatory responses can exacerbate the side effects of medications. The frequency and severity of ADRs can impact patient adherence to treatment, which is crucial for the effective management of CD. Although the overall analysis did not show a statistically significant difference in IFN-γ levels before, during, and after treatment, the observed relationship between elevated interferon levels and ADRs, as well as more severe forms of CD, is noteworthy. Elevated levels of IFN-γ, a key pro-inflammatory

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

cytokine, may reflect an enhanced inflammatory response that could contribute to both the severity of the disease and the occurrence of ADRs (6). This finding suggests that patients with higher baseline or treatment-induced levels of IFN-γ might be at greater risk for experiencing more severe ADRs (7). This study highlights the importance of evaluating the inflammatory response and genetic factors in CD patients treated with BNZ. Identifying elevated interferon levels associated with ADRs and the presence of specific genetic polymorphisms can help develop more effective and individualized clinical strategies. This will allow better management of CD, minimizing adverse effects and improving treatment adherence, resulting in better patient outcomes.

Keywords

Chagas Disease; Adverse Reactions.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Use of Benzodiazepine Drugs and Environmental Psychology: Promoting Well-Being for the Elderly in Two Nursing Homes in the State of Rio De Janeiro

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About this scientific work

DOI: 10.62922/4cbffc.cp122
Link: https://doi.org/10.62922/4cbffc.cp122
Type: Scientific Work.
Area: Public Health.
Received: 24/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Aging is a gradual and normal process of human development, characterized by a growing presence of chronic illnesses, including mental disorders (1). These aspects signal physical and mental dysfunctions, denoting compromised autonomy and self-care in health (2). For this reason, many elderly people are institutionalized, at the behest of or in the absence of family members. Despite receiving the necessary care when they are institutionalized, nursing homes (NHs) provide an institutional setting that

is different from the family nucleus, in which interaction with society is reduced and feelings such as sadness and loneliness can arise (3). In this sense, there are manifestations involving mental disorders, such as depressive and anxiety disorders (1). This leads to the use of psychotropic drugs to treat the symptomatic manifestations of these disorders. This issue is of particular interest given the use of benzodiazepine anxiolytics (BZD), since these psychotropic drugs can cause dependence and tolerance (1). On the other hand, in the stages of human development, there are specific characteristics of the aging process relating to mental health, linked to affective losses. In this sense, inserting activities based on environmental psychology aimed at well-being, whether artistic or related to the environment, are ways of keeping the brain active, reducing the occurrence of depression and cognitive loss (4). Environmental psychology seeks to understand how environmental conditions influence cognitive abilities (5).

Aim

The aim of this study was to identify the profile of BZD use in elderly people in two NHs, one in the municipality of Seropédica and the other in Nova Iguaçu, both in the state of Rio de Janeiro. In addition, the elderly experienced activities in the context of environmental psychology during outings at the Botanical Garden of Universidade Federal Rural do Rio de Janeiro (UFRRJ).

Methods

The study was approved by the Research Ethics Committee (CEP) of UFRRJ, with CAAE number 70683823.7.0000.0311 and opinion number 6.177.708. The study included male and female elderly people aged between 60 and 98 who used BZD as one of their treatments and were autonomous enough to participate voluntarily. to this end, five instruments were used, namely: a sociodemographic questionnaire; a self-report questionnaire on benzodiazepine dependence - BENDEP-SRQ PV (short version); a questionnaire characterizing the pattern of use of sleeping medication; a questionnaire to define the insomnia severity index; and a questionnaire to identify the age trait. Considering the inclusion criteria, only the elderly who used BZD drugs (N = 10) in the two NHs were invited to take part, except for the sociodemographic questionnaire, in which case all the elderly residents with adequate cognitive abilities (N = 35) took part. In a complementary way, 20 elderly people from the NH in Seropédica took part in an activity involving bodily expression, with music and dance; as well as emotional expression with projective techniques in the form of drawings after the dance activity.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

From the application of the instruments in both institutions, the results showed that the majority of the elderly (77.8%) reported that the medication made them feel safe and if they discontinued use they would feel bad. More than 60% reported they felt depressed/sad due to the absence or infrequent visits of family, which made them feel alone and neglected. In addition, in one of the questions, 50% of the

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

elderly said that they would like to be happy as others seem to be, which reinforces this feeling of loneliness and sadness. Some of the elderly had tremors in their limbs even at rest, probably as an adverse reaction to the medication used. Half of the interviewees also said that they had sleep problems, either not sleeping well or waking up a lot in the early morning hours. A good family relationship is elderly people's best hope of maintaining emotional ties and represents a solution to avoid the feeling of abandonment (3). Family visitation was the issue most often mentioned by the elderly in conversations, reaffirming the importance of this relationship for them on a daily basis. The results revealed the importance of the family bonds for mental health of the elderly, since the absence of family brings feelings of sadness and loneliness that impair mental stability. In addition, reports of difficulty sleeping should be analyzed, since prolonged treatment with BZDs generally leads to the development of tolerance, resulting in therapeutic ineffectiveness and consequent difficulty in sleeping.With regard to the environmental psychology activities, the elderly indicated through drawings with expressions of joy that they enjoyed the relationship established with the environment and dancing. Some of the elderly reported that they would like to engage in the activity every week and others said that their pain had improved as a result of the activity.

Discussion

These data show that the process of caring for institutionalized elderly people should not be based solely on the use of medication, since human psychological needs are linked to the social skills provided by social interaction and relationships with the environment. Artistic and cultural activities provided by dance and popular Brazilian music added to the manifestation of feelings through bodily expression, revealing the importance of non-psychopharmacotherapeutic actions in the daily lives of institutionalized elderly people.

Keywords

Benzodiazepinicos; Idosos; Dependência; Psicologia Ambiental.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Use of Clonazepam in Suicide Attempts in a Roraima Hospital: Toxicological Considerations

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About this scientific work

DOI: 10.62922/4cbffc.cp123
Link: https://doi.org/10.62922/4cbffc.cp123
Type: Scientific Work.
Area: Public Health.
Received: 18/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Drug poisoning can result from the irrational and indiscriminate use of medications, momentarily or prolongedly, intentionally or accidentally, regardless of the route of administration, causing clinical conditions of different levels (1). The effects of drug poisoning vary from the mildest to the most severe and are the second largest cause of clinical complications and deaths in relation to human poisoning (2). Sedative-hypnotics have been associated with suicide attempts and completed suicides in a number of toxicologic, epidemiologic, and clinical studies. Most studies, however, inadequately address confounding by insomnia, which not only is a component of many mental health disorders that increase suicidal risk, but also is independently associated with suicidality (3,4). Clonazepam, for example, is a long-acting benzodiazepine with t½ of around 23 hours. It available for oral dosage, and is commonly used in seizure disorders, acute mania and movement disorders. It is said to be absorbed completely after oral administration. The clonazepam augments the action of the inhibitory neurotransmitter GABA by binding to the GABAA receptor subtype (5).

Aim

Identify the most frequent toxic agent among cases of exogenous drug poisoning in a hospital in Roraima in the period 2011-2022.

Methods

This is a documentary, cross-sectional, quantitative and descriptive study of cases of exogenous drug poisoning notified in a hospital in Roraima. The data were collected in the Information and Notifiable Diseases System database (SINAN, in portuguese). For data analysis, the IBM Statistical Package for the Social Sciences (IMB SPSS) software, version 23.0, was used. The study was approved by the Research Ethics Committee under the technical advice 6.129.683.

Ethics

The authors have obtained and submitted all necessary ethical approvals and documentation required for the conduct of this study.

Results

From 2011 to 2022, 1,133 cases of exogenous drug poisoning were notified in the study hospital. Of the total notified cases (n = 1,133), in 283 (25.0%) the toxic agent was the benzodiazepine clonazepam. The most affected age group was between 20-39 years old (n = 166, 58.7%), the most frequent circumstance of use was in suicide attempts (n = 259, 91.5%) and, regarding the evolution of the condition clinical, 2 cases were notified as “death due to exogenous intoxication” (0.7%), 4 as “cure with sequelae” (1.4%), 32 as “cure without sequelae” (11.3%) and the majority of cases as “lost to follow-up” (n = 225, 79.5%).

Discussion

The results show that, although clonazepam was the drug most used in suicide attempts, the lethality and morbidity observed were low. For Costa et al. (2021), the choice of drugs for self-harm shows that ease of access to the method is a decisive cause for attempted suicide (6). This fact may also be related to the ease of access to the drug. It is known that the use of long-term benzodiazepines is associated with a risk of developing dependence and abuse. However, benzodiazepines are relatively safe, and fatal cases are rare, unless other drugs are taken concomitantly. Ethanol is a common contributor to deaths involving benzodiazepine use, and true coma is uncommon in the absence of other Central Nervous System depressants (5). The main adverse effects of chronic treatment with oral clonazepam are somnolence and lethargy (7). However, symptoms of clonazepam overdose include somnolence, confusion, coma and decreased reflexes (8). Benzodiazepines poisoning is treated symptomatically and if warranted, with a specific antidote, flumazenil. Flumazenil (given intravenously) acts as a competitive antagonist to benzodiazepine by binding to GABAB, thus preventing the binding of orthosteric and allosteric ligands to the receptors (5,8). Based on the above, individuals who present suicidal ideation or previous suicide attempts must be carefully monitored and take greater care in choosing the drugs prescribed for their health treatments.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Bzd; Toxicity; Exogenous Intoxication.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmaceutical Care: Health Education Strategies for the LGBTQIA+ Community

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About this scientific work

DOI: 10.62922/4cbffc.cp124
Link: https://doi.org/10.62922/4cbffc.cp124
Type: Scientific Work.
Area: Public Health.
Received: 22/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Pharmaceutical care is a clinical practice model aimed at promoting health through clinical services provided by pharmacists, addressing patient needs (1, 2). In this way, pharmacists play a crucial role in Health Education, a clinical service that aims to empower individuals to manage their health and increase safety in daily activities, contributing to the improvement of health practices and safety in disease treatment (3). This professional is considered the most accessible within the healthcare system, playing a vital role in health services in various settings, such as Basic Health Units and community

pharmacies, ensuring universal and comprehensive access to health for the entire population (4), including marginalized groups, in alignment with the principles of the Unified Health System (SUS) (5, 6). Thus, the LGBTQIA+ community is a vulnerable group facing societal challenges that harm health, such as hate crimes, stigmas, and social exclusion, leading to the need for pharmaceutical care (7). Studies indicate that gay and bisexual men are four times more likely to commit suicide than heterosexual men, while lesbian and bisexual women have twice the propensity for suicide compared to heterosexual women (8). Additionally, the suicide attempt rate among transgender individuals is high, exceeding 30%, higher than the 8.7% rate observed in the cisgender population (9). In summary, the vulnerability of the LGBTQIA+ community and their access to healthcare are current and growing areas of study. However, it is important to highlight existing methods and strategies through Health Education, thus allowing the dissemination of information that results in health literacy regarding disease prevention and treatment (10).

Aim

This study aims to identify relevant strategies, through a critical selection, in the literature adopted in Health Education targeted at the LGBTQIA+ community. Additionally, it seeks to identify the main barriers to accessing health information.

Methods

This study is a narrative literature review on the topic: Health Education Strategies in the LGBTQIA+ Community. It employs a descriptive and exploratory approach, aiming to identify the most relevant research existing in the literature. Identification of Studies: for the identification of studies, a random search methodology was adopted using pre-selected keywords in the following electronic databases: PubMed and SciELO. The keywords used were: “Health Education”, LGBTQIA+, Pharmacist. The keywords were used in combination to find the most relevant studies in the current literature. Inclusion and Exclusion Criteria: in the selection of studies, inclusion and exclusion criteria were applied to determine relevance and suitability to the topic, ensuring that the research highlights important Health Education strategies that stand out in clinical practice. The inclusion criteria were defined as follows: The research must address Health Education specifically for the LGBTQIA+ community. The studies must present Health Education strategies. The research must explore access to health information and services. The exclusion criteria were defined as follows: Studies from conference proceedings. Studies addressing marginalized communities other than LGBTQIA+. Studies that do not address Health Education.

Results

A total of 07 articles were selected and analyzed following the inclusion and exclusion criteria. Various strategies for health education aimed at the LGBTQIA+ community were highlighted. One such strategy is the inclusion of LGBTQIA+ health content in pharmacy course curricula. In 57% of the analyzed articles, the training of healthcare professionals to handle LGBTQIA+ patients was deemed fundamental. Therefore, the implementation of specific training for healthcare professionals, including the use of

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

appropriate pronouns and the management of name changes in prescriptions, was emphasized. Continuous education and the training of pharmacy students in transgender patient care were also highlighted, as demonstrated by the increased confidence of students in advising on gender transition medications. The implementation of pharmacist-led services also proved to be an important strategy for reducing health disparities. These services include hormone therapy, adherence to antiretrovirals for HIV, and the management of chronic and mental illnesses. Another strategy discussed was the conduct of educational seminars, as shown in a study that evaluated the effectiveness of five seminars, resulting in improved proficiency and confidence of professionals in providing patient care. Additionally, education focused on LGBTQIA+ health proved effective in increasing the competence of pharmacy students. Female students and those who knew a transgender person demonstrated greater comfort in discussing sexual behavior with LGBTQIA+ patients, indicating the importance of personal and demographic experiences in healthcare. Finally, the integration of clinical pharmacists to assist in the monitoring of medications for patients undergoing gender-affirming hormone therapy (GAHT) in community outpatient settings was highlighted, improving access for new patients and follow-up for individuals on GAHT.

Discussion

The 07 selected articles highlight important strategies for health education aimed at the LGBTQIA+ community. The results of these studies align with research that also emphasizes the importance of health education for LGBTQIA+ patients. The inclusion of pharmacist-led services for gender minorities is also consistent with successful approaches in other health areas (11, 12). Thus, the discussed strategies have significant implications for clinical practice. Healthcare professionals who receive specific training can offer more sensitive and inclusive care. This can improve treatment adherence and reduce health disparities. The lack of focus on the health of this community from the undergraduate level in pharmacy courses results in professionals being unprepared to effectively serve this population. Therefore, the studies highlighted the importance of educational campaigns addressing relevant topics for the LGBTQIA+ community, such as STI prevention, mental health, hormone use, and pronoun alignment with social identity. These campaigns showed great efficiency when conducted by pharmacists. Additionally, pharmacists play a crucial role in medication counseling and ensuring positive health outcomes. to achieve this, there must be an interest in improving communication skills, learning appropriate vocabulary for transgender individuals, and understanding the specific challenges of the community and individual patients. These strategies demonstrate the need for multifaceted and inclusive approaches to promote the health of the LGBTQIA+ community. Implementing these practices can significantly contribute to providing effective Health Education tailored to the community, consequently improving their quality of life. However, barriers still exist that hinder the full execution of these strategies in clinical health services. The main barriers include the lack of confidence among healthcare professionals in dealing with LGBTQIA+ issues and the perceived discrimination by patients. Many professionals do not feel adequately educated about transgender issues and lack confidence in providing appropriate treatment, deterring LGBTQIA+ patients from seeking necessary care. Differences in the scope of practice hinder the implementation of specific services for sexual and gender minorities. Thus, discrimination based on sexual orientation and gender identity is a social determinant of health, causing

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

suffering and illness. Moreover, conditions such as unemployment, lack of access to housing, and other vulnerabilities contribute to the distancing of LGBTQIA+ patients from healthcare professionals, who should apply strategies like these to benefit the patient by providing support and care. Therefore, the study demonstrated the significant role pharmacists play in practicing Health Education and how this clinical service impacts the health of individuals who receive it. It also highlighted some pertinent strategies to improve existing clinical practice and other strategies to implement new practices to benefit the LGBTQIA+ community. Finally, this work presented satisfactory results that highlight effective ways to provide health care through Health Education for the LGBTQIA+ community.

Keywords

Health Education; LGBTQIA+; Pharmaceutical Care.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Impact of Pharmaceutical Activity on the Identification and Control of Syphilis in the Municipality of Serra-ES

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About this experience report

DOI: 10.62922/4cbffc.cp125
Link: https://doi.org/10.62922/4cbffc.cp125
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Syphilis is a preventable, curable and exclusive Sexually Transmitted Infection (STI) of humans, caused by the bacterium Treponema pallidum. It presents many clinical manifestations and different stages (primary, secondary, latent and tertiary), and can be transmitted through unprotected sexual intercourse with an infected person or during pregnancy and birth to the baby(1). The diagnosis is made through rapid tests and, in case of positivity, it is necessary to confirm with a laboratory test. Treatment consists of applications of benzathine penicillin for three consecutive weeks, which is essential to avoid injuries. Syphilis cases among adults aged 15 to 49 increased by 30% between 2020 and 2022 in the Americas, according to a report from the World Health Organization (WHO)(2). The municipality of Serra-ES is inserted in this context, having identified a significant increase in the number of cases of congenital syphilis by Epidemiological Surveillance (VE). Given the seriousness of this situation, it is essential to develop intervention actions and combat syphilis, aiming to control the epidemic process. Thus, multidisciplinary actions began, with the inclusion of the pharmacist in the flow to identify and monitor cases of the disease. Stock control of rapid tests was reorganized by Primary Health Care, VE and

Pharmaceutical Services and Policies, giving the pharmacist the responsibility for packaging, dispensing and monitoring.

Aim

Include the pharmacist in the syphilis care routine in the Municipality of Serra-ES. Act as a reference for guidance on rapid syphilis tests in accordance with the manufacturer's guidelines and evaluate the impact of the guidelines provided. Demonstrate the pharmacist's routine with the multidisciplinary team, at the Basic Health Unit (UBS) of Planalto Serrano Block a in the municipality of Serra-ES.Include the pharmacist in the syphilis care routine in the Municipality of Serra-ES.

Methods

It refers to a quantitative, descriptive and comparative study on the use and recording of rapid syphilis tests and their results, as well as the number of notifications for syphilis in the municipality of Serra-ES in the 1st half of 2024 in relation to the 1st half of 2023. The data were obtained through the e-SUS/VS system, provided by VE management and data available in GTI on July 19, 2024, in addition to data in an internal Active Search spreadsheet at UBS Planalto Serrano Block A. The tests , now stored in the pharmacy, are divided and identified with a description of the pipette volume, number of reagent drops and reading time, and are dispensed, per patient, by the pharmacist or pharmacy assistant. Every patient is recorded in a spreadsheet carried out by the performer, which is subsequently carried out in the GTI by the pharmacist. When positive, the pharmacist monitors the treatment until completion and carries out an active search, if applicable. Guidance on rapid tests for the nursing team is provided whenever necessary, based on Technical Note nº 26, available at GTI and the manufacturer's instructions. The results were interpreted in light of the numbers obtained, keeping patient data confidential. They are described in tables and presented in bar graphs, analyzed by statistical trends. The Portuguese language descriptors were used: syphilis, pharmaceutical care and rapid test, using works from the Scielo collection, Pub Med and official sources.

Results

The final data from the study shows that the number of rapid tests carried out for the general public in the first half of 2023 was 2,772 tests and in the first half of 2024 it was 4,157, indicating an increase of 49.96% in rapid test performance. . The number of pregnant women who had the tests carried out, also in the first half of 2023 and 2024, were 1,587 and 2,009 respectively, indicating an increase of 26.59%. On the other hand, the number of reported cases of syphilis (acquired, pregnant and congenital combined) in 2023 was 1,102 and in 2024, 1,390, which indicates an increase of 26.13% in notifications. The final data for congenital syphilis in the first half of 2023 and 2024, respectively, are 89 and 77, thus indicating a 13.48% reduction in notifications. At the Health Unit of Planalto Serrano Block A, in the first half of 2024, 132 Syphilis tests were registered in the GTI and 52 treatments for Syphilis were carried out. 14 active searches were carried out for the patient with uncompleted treatment and to confirm treatment in other Basic Health Units. There is no data on records of tests carried out and active searches in the first half of 2023.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

The change in the protocol for controlling rapid tests, as well as directing pharmaceutical attention to monitoring positive cases, proved to be effective in controlling syphilis in Serra-ES. Considering the data obtained, it was possible to contribute to health surveillance strategies, demonstrating a positive impact of the pharmacist's intervention in the management of syphilis, which demonstrates how important it is to monitor the use of medication and adequate adherence to treatment, recording and the consolidation of data for epidemiological purposes. In addition, the correct recording of tests on behalf of patients in the pharmacy dispensing program was ensured. This allowed for effective monitoring of positive cases, making active search more efficient and generating more reliable indicators. Considering the pharmacist as an integral part of the multidisciplinary team in the management of syphilis is essential for the effective control of the disease, especially in pregnant women, as, being considered a serious public health problem, it requires a comprehensive approach, so that it is possible to achieve the objective of WHO aims to eradicate the disease by 2030(2).

Keywords

Syphilis; Pharmaceutical Care; Quick Test.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Experience Report: Performance of the Specialist Transplant Pharmacist Resident

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About this experience report

DOI: 10.62922/4cbffc.cp126
Link: https://doi.org/10.62922/4cbffc.cp126
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Practical knowledge about the conduct of clinical pharmacists in transplantation is extremely important so that their work can have a positive impact on the pharmacotherapy of transplant patients, most of whom are polymedicated individuals. In this context, the practice of multiprofessional residency provides pharmacists with tools to deal with the future challenges of clinical practice.(1)

Aim

Reporting on the challenges of the pharmacist's experience in the transplant residency.

Methods

This is a descriptive observational study of the experience report type. to support the study, bibliographic searches were carried out in the Pubmed, Scielo and Scholar Google databases, using the descriptors Resident Pharmacist, Clinical Pharmacy and Transplants, including works from the periods between 2020 and 2024, in any language. The experiences reported in this study took place between March and August 2024, at a University Hospital, in the renal and liver transplant wards and outpatient clinics.

Results

The pharmacist's first contact with the routine of the multiprofessional transplant residency brings with it a sense of urgency in acquiring knowledge related to clinical practice and the awareness that in order to be an expert in promoting the rational use of medicines with appropriate drug therapy and disease prevention, a great deal of knowledge is needed about drugs, various pathologies, as well as interpersonal relationships and humanization. It is part of the routine of the clinical pharmacist specializing in the area of transplantation to carry out drug reconciliation within 72 hours of the patient's admission in order to assess discrepancies between the pharmacotherapy prior to hospitalization and the pharmacotherapy carried out at the institution.[2] on a daily basis, technical analyses are carried out on the prescriptions and clinical reviews of the pharmacotherapies of patients admitted to the renal and liver transplant wards, whether they have recently been transplanted or have been hospitalized due to complications arising from their health conditions. These activities are carried out with the aim of identifying possible non-conformities related to the doses, routes of administration, dilution and infusion time present in the prescriptions, assessing whether the prescribed drugs are necessary, effective, safe, convenient to administer and whether the cost-benefit ratio is being considered in terms of pharmacoeconomic aspects.

Discussion

Communication between the multidisciplinary team is essential if the patient's treatment is to be optimized.[3] the pharmacist positions himself as an ally to the medical team, presenting recommendations in cases where points for improvement are identified in the prescriptions. They also carry out pharmacovigilance, identifying and reporting adverse reactions to medicines used in the hospital environment. When the patient is discharged, various guidelines are given about their treatment, access to medicines and multiprofessional outpatient care.At this time, the transplanted person is also given a medication plan - which consists of a table with the patient's information, dose, dosage, time and route of administration, mode of use and the name of the drugs used by the patient - with the aim of increasing the patient's comfort and adherence to the treatment, which after the transplant includes immunosuppressants that were not part of their day-to-day routine. This strategy also contributes to safety when using the drugs, since they can interact with each other, with food and sometimes have

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

variations in efficacy depending on the time they are used.[4]: in light of the above, multi-professional experience improves and provides skills such as communication, co-responsibility and problem-solving to deal with adverse situations arising from healthcare. The multiprofessional transplant residency highlights the importance of pharmacists in promoting, protecting and recovering well-being, providing them with the expertise to identify situations that pose a risk to the patient's health in terms of their pharmacotherapy.

Keywords

Resident Pharmacist; Clinical Pharmacy; Transplants.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Academic Monitoring in Clinical Pharmacy: an Experience Report

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About this experience report

DOI: 10.62922/4cbffc.cp127
Link: https://doi.org/10.62922/4cbffc.cp127
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Health education aims to train professionals with specialized knowledge and skills to provide reliable patient care. However, several challenges are faced in Brazil and around the world, especially in the formation of theoretical and practical knowledge about clinical pharmacy. Therefore, to minimize these challenges, it is necessary to redirect strategies to guide the learning process, strengthening pedagogical practices that integrate higher education with health services and society, uniting teaching, research, and extension during training (1). In this context, the proposal for academic monitoring emerges as a tool to aid in the teaching-learning process, contributing to the learning of both students and teachers. Academic tutoring, which has been used for a long time across various fields, must adapt to current demands to offer students new ways of learning different content (2). The practice of academic tutoring challenges the notion of the teacher as the sole mediator of knowledge. This teaching approach is characterized by the participation of students and tutors in various projects developed to support undergraduate teaching. Tutoring is seen as supporting the pedagogical process, assisting students in

overcoming academic difficulties, and consequently improving the quality of teaching. The tutor acts as a facilitator of learning, helping other students in a more accessible way, as they are also students. Additionally, the tutor serves as an interlocutor, mediating what is learned inside and outside the classroom and collaborating with supervising teachers and fellow students to disseminate knowledge (3).

Aim

This study aims to report on monitoring practices in the discipline of Clinical Pharmacy and Pharmaceutical Care at the Federal University of Maranhão, highlighting proposals, challenges, and contributions to the development of learning.

Methods

This is a descriptive study in the form of an experience report, based on the students' experiences during the monitoring period in Clinical Pharmacy and Pharmaceutical Care. This subject is part of the compulsory curricular component of the Bachelor of Pharmacy course at the Dom Delgado campus of the Federal University of Maranhão. The monitoring workload is 12 hours per week per semester, with fixed times during class with the presence of the teacher and one meeting a week only with the student monitors, defined according to the availability of the students. The demand is spontaneous, and the service can be individual or in groups, depending on the needs and availability of the monitor.

Results

The follow-up project for the subject of Clinical Pharmacy and Pharmaceutical Care began on 15 March 2024, under the coordination of the teaching staff. The aim was to integrate students and enhance their understanding and skills in clinical pharmacy practice. Activities were conducted according to the teaching schedule and syllabus, with weekly meetings lasting two hours, usually held on Mondays. The detailed timetable covered topics such as primary care, pharmaceutical consultation, pharmacotherapy review, and drug-related problems. Up-to-date teaching materials and simulations supported these activities, while individualized mentoring addressed the specific needs of students. Case studies and problem-solving exercises facilitated the application of theoretical knowledge to real clinical scenarios. A teachers' strike at federal universities, which began on 26 April, interrupted the activities. Before the strike, five meetings were held: the first two focused on reviewing theories covered in class, and the next three concentrated on case studies, clinical simulations, and guidance for a project titled "Reviewing the Pharmacotherapy of Polymedicated Elderly Patients." This project provided practical experience in pharmaceutical care. The break lasted about two and a half months. Upon returning, the initial meetings were dedicated to re-establishing the timetable and redefining the approach. Student engagement was crucial to the success of the activities, contributing significantly to the development of knowledge and practice in Clinical Pharmacy.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

Faced with the challenges of complex content and the need for practical teaching methods, tutoring supports active and innovative methodologies such as case studies, simulations, and group discussions, which facilitate memorization and promote a deeper understanding in real clinical scenarios (4). Time constraints can make it difficult to reconcile academic activities and diversify the mentoring plan. However, utilizing virtual channels such as Google Meet and WhatsApp has proven to be an effective solution, optimizing time and improving communication between tutors and students. This approach allows for quick meetings and clarification of doubts without the need for physical travel, ensuring more efficient time management and greater flexibility in organizing tutoring activities. The part-time strike had a significant impact on student learning. The interruption of classes and academic activities led to delays in the timetable, compromising the continuity of the syllabus and preparation for assessments. The lack of regular contact with teachers and the suspension of teaching resources made it difficult to assimilate important concepts, creating gaps in knowledge (5). This forced break generated uncertainty among the students, affecting their motivation and academic performance, and the need to reorganize and make up for missed classes represented an additional challenge. Tutors play a crucial role in facilitating learning by assisting peers with academic difficulties in an accessible manner. They act as interlocutors, mediating what is learned inside and outside the classroom, and collaborate with supervisors and colleagues to disseminate knowledge (3). The tutoring experience in Clinical Pharmacy and Pharmaceutical Care has proven to be a valuable tool for improving students' academic performance. By integrating active methodologies such as case studies and simulations, students developed a deeper understanding of the content and improved their skills in real clinical scenarios. The role of tutors as facilitators was essential in helping students navigate the complexity of the content and manage time constraints. The strategies adopted, such as the use of virtual channels for communication and academic support, were effective in optimizing time and facilitating interaction between tutors and students, especially in situations such as strikes or travel restrictions. This flexibility was key to maintaining the continuity of teaching and minimizing the impact of interruptions on the academic schedule (4). The monitoring project not only aided in students' academic development but also bridged the gap between teaching and the practical reality of clinical pharmacy. The integration of teaching, research, and extension provided a more comprehensive and contextualized education, preparing students to face the challenges of the job market with a solid theoretical and practical foundation. For the future, it is essential to continue improving and expanding academic monitoring practices, incorporating new technologies and teaching methods that meet the current demands of higher education. Creating more spaces for discussion and exchange of experiences among tutors, teachers, and students can further strengthen the quality of teaching and the development of critical and practical skills (6).

Keywords

Monitoring; Clinical Pharmacy; Pharmaceutical Care.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Indicator of Pharmaceutical Interventions in a Pediatric Intensive Care Unit in the Northern Region: Case Report

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About this experience report

DOI: 10.62922/4cbffc.cp128
Link: https://doi.org/10.62922/4cbffc.cp128
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Since 1992, Brazilian entities have pointed out the need for instruments that make it possible to evaluate services in the hospital environment 1, and indicators are essential for the planning of an institution and make it possible to evaluate services primarily. It is essential to ensure quality health care, corroborating the reduction of risks and increased chances of therapeutic success 2. Pharmaceutical intervention, being an action outlined and part of the pharmacotherapeutic follow-up process, aims to prevent or solve negative clinical results from the use of drugs 3. Such practice becomes fundamental for clinical treatment as medication errors are prevented, therapy cost reduced and patient hospitalization time 4. The pediatric scenario is quite specific due to the use of off-label drugs (use outside the recommendations recorded in the package insert), therefore, there is a lack of scientific studies directed to the use of drugs by this population, as well as there is also a limited amount of adapted dosage forms and the characteristics of the physiology of this age group. Thus, such factors contribute to a higher risk of occurrence of Adverse Drug Events (ADEs) in children and adolescents 5. Errors or failures in health

care that affect the patient, which may or may not cause iatrogenic illness to the patient, are called incidents. Adverse events are incidents that have the potential to cause temporary or permanent damage, and even the death of the patient 6.

Aim

The objective of this study is to survey the indicator of pharmaceutical interventions performed in the pediatric Intensive Care Unit by pharmacists, corroborating patient safety and mitigation of adverse events related to medications.

Methods

This study is characterized as an experience report, focused on the analysis of medical prescriptions made by pharmacists in the Intensive Care Unit (ICU) of a Pediatric Hospital located in the northern region of Brazil. Data collection took place during the months of June and July 2024. This period was chosen due to the need to identify and understand pharmaceutical interventions in a specific context of high demand and complexity, reflecting a real and dynamic scenario of clinical practice. The hospital in question is the only institution in the region that offers medium and high complexity care, with 21 pediatric ICU beds. This characteristic makes it a crucial reference point for the care of children in critical health conditions. The analysis of the pharmaceutical interventions was carried out based on a thorough examination of the medical prescriptions, seeking to identify the adequacy of the proposed therapies, possible drug interactions and the need for adjustments in the doses, among other interventions aimed at optimizing pharmacotherapy. The methodology adopted involved a systematic review of the prescriptions made daily, with a special focus on the clinical conditions of hospitalized patients. The pharmacists in charge carried out interventions as needed, documenting each action taken, as well as the clinical justifications and results obtained. This analysis and intervention process was conducted in collaboration with the medical team, ensuring a multidisciplinary approach to patient care. In addition, the hospital is situated in a border region, which has a high immigration rate. This factor contributes to the complexity of care, given that many patients come from different sociocultural and health contexts, which can influence prescription practices and the need for specific pharmaceutical interventions.

Results

The pharmaceutical intervention indicator was used after analysis of medical prescriptions, this indicator covered the following types: dose, dosage, pharmaceutical form, duplicity, diluent, infusion time, therapy time and others when it was not related to any of these criteria. In June 2024, 588 prescriptions were evaluated, of which, 231 prescriptions had errors, totaling 39%. A total of 27 interventions were performed, of which 26 were accepted and 01 was not accepted, totaling an acceptance rate by the team of 96.30%. In the classification of the types of intervention, the dosage of administration obtained the highest number, with 09 related interventions. In July 2024, 649 prescriptions were evaluated, of which, 128 prescriptions had prescription errors, totaling 20%. 18 interventions were performed, of which 16 were accepted and 02 were not accepted, totaling an

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

acceptance rate by the team of 88.89%. In the classification of the types of intervention, the dosage and dose of administration obtained the highest numbers, with 06 interventions for each.

Discussion

The indicator of pharmaceutical intervention in an ICU is of paramount importance, because in this environment it is customary for the patient to use various drug therapies, they are polymedicated due to their comorbidities and the situations of the critical clinical condition. When analyzing the data, it is observed that the acceptance rate by the team is high, being 96.30% and 88.89%, in the two months, respectively. This demonstrates that the adherence of the medical team to the pharmacists is positive and the participation of the pharmacist in an ICU is important, therefore, this professional must be directly interconnected with the team, working together, showing their role in what is consistent with the patient's drug therapy, in this way, many paradigms are mitigated and the greatest gain is for patient safety and in the mitigation of medication errors, which can often lead to death. It is important to highlight that for the pharmacist within an ICU, when gaining his space and the trust of the professionals, it is a thorough and long-term job, but after he achieves such goals, notoriety is recognized by the team. It is observed that in the second month of use of the pharmaceutical intervention indicator there was a reduction in prescription errors, in June it occurred 39% and in July it was 20%. In the first month the rate was high, this is a very important fact, in addition to being an ICU, it is a pediatric population, where in these the metabolism is different from that of an adult, which influences the pharmacokinetics and pharmacodynamics of the drugs and consequently the effectiveness of the drug, which can corroborate adverse reactions. It was observed that in the second month of evaluating the prescriptions and making the interventions, the rate of prescription errors was reduced by 19%, it is noted that with the presence of the pharmacist in the face of errors and always taking such issues to the prescribers, there was greater attention at the time of prescription, so the medical team before delivering the prescription checked the prescription. Another point to highlight was the adjustments that were adapted in the system to reduce errors, establishing standardized schedules in the administration of medications. Such resources used reduced errors, however, it is worth noting that medication errors can cause harm to patients and are often irreversible.

Keywords

Pharmaceutical Interventions; Indicators; ICU.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Analysis of Pharmaceutical Interventions By the Clinical Pharmacy Service in Inpatient Units of a Psychiatric Hospital

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About this experience report

DOI: 10.62922/4cbffc.cp129
Link: https://doi.org/10.62922/4cbffc.cp129
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Medication-related problems (MRP) are undesirable events that occur during pharmacological treatment and may or may not cause harm to the patient (1). as a patient care strategy in the hospital setting, pharmaceutical interventions (PI) represent an important means of resolving MRPs, constituting an essential strategy in optimizing pharmacotherapy, as well as in preventing adverse drug reactions, which contributes to the improvement of clinical outcomes. Furthermore, the analysis of MRP and the continuous implementation of PI with multidisciplinary teams contribute to minimizing healthcare costs and to the continuous improvement of pharmaceutical practice (2). In the context of mental health, some particularities make pharmacological treatment challenging, including delayed onset of action, the need for frequent dosage adjustments, high occurrence of therapeutic ineffectiveness, adverse

reactions of varying severity, and complex drug interactions. These aspects are even more challenging in psychiatric hospitals, where the implementation of complex therapeutic regimens with psychotropic medications is often necessary (3). In this scenario, the classification and categorization of MRP in psychiatric hospitals are fundamental in implementing strategies aimed at improving the quality of patient care.

Aim

The objective of this study was to analyze and quantify pharmaceutical interventions, according to the classification and categorization of MRP, performed by the clinical pharmacy service in inpatient units of a psychiatric hospital.

Methods

This is a cross-sectional and retrospective study. Data were collected from a PI registration spreadsheet carried out between January and June 2024, with health professionals in inpatient units for adult patients at a public psychiatric hospital in the state of Ceará. The following variables were analyzed: frequency of PI after classification (necessity, effectiveness, and safety) and categorization of MRP (necessary or unnecessary medication, inconsistencies in prescription, inadequacy/absence of schedule, non-standardized items, duplication, and others in smaller proportion).

Results

In the present study, a total of 392 pharmaceutical interventions were performed. Regarding the need for prescribed medications, 208 interventions (53.06%) were identified. In terms of patient safety, 147 interventions (37.50%) were observed. Additionally, 37 interventions (9.44%) were performed aiming at the effectiveness of pharmacological treatment. Among the interventions performed, 116 (29.59%) were related to the presence of unnecessary medications in the medical prescription. In addition, 71 interventions (18.11%) were performed due to inconsistencies in prescriptions, such as typing errors, use of non-standard abbreviations in medication names, and incomplete information. A total of 44 interventions (11.22%) referred to the need for medications not prescribed, while 35 (8.93%) addressed the inadequacy or absence of scheduling. Furthermore, 28 interventions (7.14%) occurred due to the prescription of medications not standardized in the hospital. There were also 20 interventions (5.10%) due to medication duplication, either by repeating items in the same prescription or by the concomitance of drugs with the same mechanism of action. Finally, 78 interventions (19.90%) corresponded to other MRP, such as underdose, overdose, and lack of medications in stock.

Discussion

The clinical findings of this study revealed that most of the PI performed are classified in the necessity group, with unnecessary medication being the most frequent category. This usually occurs when the prescribed medication is not necessary, either due to the lack of clinical indication or due to the end of treatment. In an Australian study conducted in the wards of a psychiatric hospital, discontinuation of medication was the second most common MRP, behind only the exchange of medications, with the MRP

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

of necessity being of greater relevance. The same study found that 8.2% of the total PI involved suggestions for prescribing new medications, which corroborated our results, where it was shown that 11.2% of MRP involved the introduction of necessary medications into drug therapy (4). The second most prevalent MRP group was safety, which presented inconsistencies in the prescription as the most frequent category, representing 18.11% of the total PIs performed. This result is similar to the findings published by Silva, who identified the correction of inconsistencies in the prescription in 24.5% of the sample (5). It is noteworthy that this category of MRP, which can include omission of information regarding dosage, use of abbreviations, and spelling errors, represents a significant risk to the safety and effectiveness of pharmacological treatment. Finally, the MRP of effectiveness represented the least frequent PI, with most of the interventions in this group categorized as absence or inadequacy of schedule. Although interventions involving underdose, overdose, and incorrect dosage form also fall under the effectiveness categorization, this study indicates a low incidence of medication-related problems within this category, diverging from some studies in the literature, such as the one carried out in a psychiatric hospital in the Federal District, which obtained 47.1% of PIs performed in the effectiveness category as the most prevalent (6).

Keywords

Pharmaceutical Interventions; Psychiatric; Medication.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Strategic Impact of the Pharmacist on Clinical Decision-Making in the Stabilization Room: Experience Report in Urgency Management

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About this experience report

DOI: 10.62922/4cbffc.cp130
Link: https://doi.org/10.62922/4cbffc.cp130
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The stabilization room is a critical component of the Urgency Care Network, providing temporary and specialized care with continuous monitoring and rapid, precise interventions to stabilize severe or critical patients (1). This study documents the experience of a resident pharmacist in Urgency | Trauma, working in the stabilization room of a regional hospital in the southern cone of the state of Rondônia. The hospital is designated a Level I Trauma Center and a High Complexity Trauma-Orthopedic Care Unit. The pharmacist plays a strategic role by collaborating with the multidisciplinary team to optimize pharmacotherapy, ensure the safe reconstitution, dilution, and administration of medications, and reduce complications arising from drug use (2). Practice in the stabilization room includes managing a broad range of medications such as analgesics, sedatives, antibiotics, and hemostatic agents, which requires in-depth knowledge and the ability to make quick decisions in critical situations.

Aim

This experience report highlights the strategic role of the pharmacist in optimizing pharmacotherapy and reducing complications in critically ill patients. Through a collaborative approach with the multidisciplinary team, this report seeks to demonstrate how the pharmacist's specialized knowledge contributes to the safety and efficacy of pharmacotherapy, promotes health education among the team, and efficient resource management in a high-complexity environment like the stabilization room.

Methods

This descriptive, qualitative study is based on the clinical practice experience of a pharmacist resident in Urgency | Trauma, working in the stabilization room of a regional hospital in the southern cone of Rondônia. The hospital is designated as a Level I Trauma Center and a High Complexity Trauma-Orthopedic Care Unit, with a multidisciplinary team including general practitioners and specialists (orthopedists, surgeons, nephrologists, cardiologists, neurosurgeons, and pediatricians), as well as a dentist, social worker, psychologist, physiotherapist, nurses, nursing technicians, and pharmacist. The stabilization room operates 24 hours a day, including weekends and holidays, receiving patients from the internal units, the Emergency Care Unit, cases brought by the Fire Brigade, severe and critical cases transported in private vehicles, and referrals from adjacent municipalities. The average number of patients served is about 12 per day, spanning various age groups, genders, races, and degrees of clinical severity.

Results

Pharmaceutical interventions led to a significant reduction in medication-related errors through the evaluation of therapeutic indications, drug interactions, dosages, reconstitutions, dilutions, medication compatibility, administration routes, and infusion time. Effective management of side effects also contributed to safer clinical practice by distinguishing adverse drug reactions from patient symptoms (3). Furthermore, optimizing pharmacotherapy, including dosage adjustments for patients with impaired renal and hepatic functions and appropriate medication choices for these patient profiles, demonstrated the positive impact of the pharmacist, as well as pharmacotherapy management for patients allergic to drugs and excipients. The collaboration with the multidisciplinary team, facilitated health education on medication use, medical supplies, and updates on new therapies and treatment protocols, promoting a more integrated, collaborative, and efficient approach to managing critical cases.

Discussion

The pharmacist's actuation utilizing clinical pharmacy resources in the regional hospital's stabilization room was fundamental in enhancing patient care in urgency and trauma situations (4). The pharmacist's expertise in pharmacotherapy allowed for precise and rapid interventions, significantly contributing to treatment safety and efficacy by reducing adverse drug events and optimizing resource use, such as medication stock and response time. Close collaboration with other healthcare professionals highlighted the pharmacist's importance as a vital member of the multidisciplinary team, fostering a

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

more informed and secure decision-making environment. Despite the effectiveness of pharmaceutical knowledge in complex situations involving multiple drugs and rigorous treatment protocols, ongoing training and updating of professionals are crucial. Support from hospital administration and managers is also essential to further improve the integration of pharmacists in the stabilization room workflow. In conclusion, clinical pharmacy practice in the stabilization room not only enhances the quality of care but also contributes to a more resilient and effective healthcare system, emphasizing the need to expand this model to other urgency and trauma units permanently.

Keywords

Clinical Pharmacy; Emergency Pharmacotherapy; Urgency.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmaceutical Services and Policies in the Supervised Internship Experience Working in a Basic Health Unit: Experience Report

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About this experience report

DOI: 10.62922/4cbffc.cp131
Link: https://doi.org/10.62922/4cbffc.cp131
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 02/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The basic health unit (UBS) is the first access for users in primary care, which is primarily the environment most sought after by low-income patients. The UBS must have a structure related to their operations and types of teams, the population profile, as well as the types of health services to be offered (2). Thus, Pharmaceutical Services and Policies (AF) is of utmost importance in caring for these users, as it encompasses processes aimed at ensuring access to and the rational use of medications; therefore, it can be considered a complement to health actions, and not being restricted to logistical means (1). Furthermore, AF integrates health services through pharmaceutical care during dispensing (2).

Aim

To highlight the role of Pharmaceutical Services and Policies in the dispensing process carried out at the Almerinda Lomanto UBS, in the city of Jequié-BA, during the period from May to June 2024.

Methods

This is a descriptive study, in the form of a report on the experience based on the course “Supervised Internship in Pharmaceutical Dispensing”. The process involved the participation of three interns, one pharmacist, and one pharmacy assistant.

Results

At the time of the prescription delivery by the user, the validity, the physician’s stamp, or that of another professional such as a nurse or dentist was analyzed, it was checked whether medication had been withdrawn in the same month, a process carried out through a system provided by the municipality. Furthermore, the evaluation of the posology and dosage of the medication was conducted, as the REMUME (Municipal List of Essential Medicines) of the municipality presents specific concentrations, and at times, prescriptions with dosages different from those available at the unit occurred. In addition, this evaluation had to be performed for both continuous use prescriptions and for antibiotics and controlled substances, always under the supervision of the responsible pharmacist. It is worth noting that this stage took place in compliance with Ordinance nº. 344/98 and RDC nº. 471/2021. Thalidomide is also dispensed at the unit, in accordance with RDC nº 11 of march 22, 2011, wich “provides for the control of the substance thalidomide and the medicine that contains it” (3), since the substance is teratogenic.

Discussion

When there was an error, the patient was told to go back to the doctor to request a new prescription or to correct it, since most prescriptions are not from the professionals at the unit. It is worth nothing that during the dispensing process, there was a need to emphasize or teach the method of use, treatment period, whitdrawal of new drugs, guidance on generics, methodology to instruct the correct time of use and wich one to use at a given time (for example, notes on the most appropriate time of day to ensure medication adherence), storage and preparation of the formulation when it was in a suspension form. In light of the above, it is possible to affirm that Pharmaceutical Services and Policies is very active in primary care, helping in the process of adherence to therapy. In addition, it was observed that, most of the time, it is no easy to instruct and change inappropriate way of using and the perception regarding certain medicines and the use of generics.

Keywords

Pharmaceutical Services and Policies; Dispensing.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Results Pharmaceutical Care Implementation Project Inpartnership with Proadi-SUS in Atibaia

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About this experience report

DOI: 10.62922/4cbffc.cp132
Link: https://doi.org/10.62922/4cbffc.cp132
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 02/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Pharmacotherapeutic Monitoring is one of the pharmaceutical clinical services that can be offered to the population assisted by a healthcare team, enabling professional interaction with the patient and the team, adding their expertise on medications in order to seek the identification and solution of Related Problems to Medicines (PRM) and thus contribute to the rational use of medicines and the health of the person receiving care (1). There are several factors involved in the emergence of a DRP, which may include failures in the prescription process, difficulties in adherence and pharmacokinetic issues. Such factors may become more critical in the presence of polypharmacy (2). The Ana Nery Family Health Unit is located in the Jardim Imperial neighborhood in Atibaia and has a team of 50 people, including 06 doctors, 06 nurses, 08 nursing technicians, 01 physiotherapist, 01 nutritionist and 01 physical educator, 01 psychologist, 01 pharmacy and 02 pharmacy assistants, 14 Community Health Agents, 02

administrative staff, 6 receptionists and 1 unit manager. The territory served is 27,000 inhabitants, and services are divided into 6 teams, each of which has 6 micro-areas, totaling 36 micro-areas. In the pharmacy, the average number of services is 8,100 patients per month, according to data from the Horus System. This reflects an average of 400 visits per day. Many of the patients treated refuse to take at least one of the prescribed medications and many delay monthly withdrawals, indicating that the administration of the medication by the patient is not in accordance with the medical prescription. According to data from prevent SUS, there are indicat be improved in the Municipality in relation to diabetics and hypertensive patients, and with this in mind, diabetic SAH patients are those chosen as priority for pharmaceutical care.

Aim

This project aims to bring together these indicators and define the importance of the pharmacist inserted in the Primary Care team as well as the profile of patients referred for pharmaceutical consultation.

Methods

To start the care flow, the PROADI-SUS project was presented to the health team and a referral paper was issued that could be done by any clinical professional in the unit, including ACs and nursing technicians. The priority criteria for referral were: - Diabetics (DM1 or DM2) and decompensated hypertensive patients or those with frequent hospitalizations; - Polymedicated patient with adherence difficulties; - Patient using medication with a low therapeutic index; - New patient using an inhaler device or having difficulty administering it; After presenting and offering the service to the unit's professionals, it was also presented to patients in the Hiperdia Group, in addition to being offered by pharmacy assistants when they identified a possible compliance problem for the patient attending the dispensation. For infrastructure, the room used to store medicines was divided in half with a screen to install a table, a chair and a computer to record services in the e-sus system. The furniture and computer were purchased by the Municipality of Estância de Atibaia. The data was launched on the e-sus platform and also in a Pharmaceutical application developed by the Proadi-SUS project to be obtained and generate indicators - such as number of patients treated, number of interventions and referrals carried out, number of patients returning to consultation, number attendance at the first consultation, and it is also possible to outline the profile of patients treated such as: gender, age, reason for referral, who referred, color, education, among others. Although the project ended in October, clinical work continued and therefore the data presented in this experience correspond to consultations carried out between February and November 2023.

Results

174 patients were seen in 402 consultations, including first care and returns, of which 72 were male (41%) and 102 were female (59%). It is notable that Women sought more health care than men. Access to services pharmacists offered by race/color of patients follows the population profile of Atibaia described by IBGE, with 106 white patients (61%), 39 brown patients (22%), 24 black patients (14%) and 5 yellow patients (3%). The most prevalent health problems in patients were Type 2 Diabetes (DM 2),

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

present in 92 patients (53%); Systemic Arterial Hypertension (SAH), present in 90 patients (52%); Changes in Lipid Metabolism (Cholesterol and/or High triglycerides), present in 52 patients (30%). The joint presence of such comorbidities represents a great increase in the risk of cardiovascular problems, such as Acute Myocardial Infarction (AMI) and Stroke Encephalic (CVA). (Brazilian Society of Cardiology, 2017). At CAPS, there was prevalence of diseases related to mental health (Bipolar Disorder, Schizophrenia, Anxiety and Depression were the most frequent). 253 PRMs were identified, which can be divided into the following categories: adherence (134 events - 53%); effectiveness (63 events - 25%); security (40 events - 16%); and necessity (16 events - 6%). Among adherence DRPs, the majority were missed medication doses voluntary (51 events), with the patient choosing not to take that dose or that medication, meaning that the prescribed dosages and dosages were not followed. 3778 interventions were carried out by pharmacists during the monitoring period, this being the total number of interventions carried out in all establishments that participated in the implementation project. The interventions were recorded for each medication prescribed to patients in the patient registration tool PROADI-SUS, as well as at each consultation. The most frequent type of intervention was of treatment advice - 1094 registered interventions -, explaining use corre.

Discussion

The bond created between professional and patient was fundamental to the success of the interventions and there was greater integration with the team and patients, family members and caregivers began to better understand the importance of pharmacological treatment. There was an improvement in the level of knowledge and autonomy over their health problems and the medications they use, in addition to reduction in inappropriate medication withdrawals. ODespite the existence of an office equipped to carry out pharmaceutical consultations, the time dedicated to this process is insufficient for discussion with the multidisciplinary team, so discussions occur with each professional involved separately. as it is a health unit with a large territory, the demand and the queue at the pharmacy for dispensing medicines is large, so the service cannot be fully developed, since the current list of pharmacy employees is insufficient for current services, and it is necessary, to continue the pharmaceutical clinical service, without overloading current employees, to hire or relocate another pharmacy assistant or technician. Despite bringing results, the clinical pharmaceutical service still does not have incentives for a career plan being carried out by the same professionals who are technically responsible for the units, disrupting the flow and contributing to worker overload. With the results obtained, it is expected to further sensitize the Municipal Health Department of the importance of the service and the savings it generates, in addition to the improvement of patients with Chronic Noncommunicable Diseases, so that the work is encouraged and the role of the pharmacist fully integrate as a health professional in the Municipality's Primary Care so that hiring is not based solely on Technical Responsibility of pharmacies, since there is a need and demand for the profile of patients treated in the PSF for continuity of the Monitoring service Pharmacotherapeutic, carried out by the Clinical Pharmacist. The Ministry of Health ordinance (GM/MS no. 635) which includes Clinical Pharmacists in the E-Multi team. It now remains to encourage municipalities, states and the federation to open hiring for the position in question. The Pharmacist is an important health professional who must be part of the team for pharmacotherapeutic monitoring of the patient. This professional is able to contribute to the team and the patient's health by evaluating

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

adherence to therapy, its effectiveness and safety, participating in clinical discussions with prescribers to optimize the patient's therapy and with the patient themselves seeking tools that can assist the individual in their adherence process, which avoids negative outcomes and better chances of controlling chronic non-communicable diseases, in particular, Type II diabetes.

Keywords

Pharmaceutical Care; Diabetes; SUS.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmaceutical Guidance in a Rehabilitation Center: Experience Report By Pharmacy Students in an Extension Project with Parkinson's Disease Patients

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About this experience report

DOI: 10.62922/4cbffc.cp133
Link: https://doi.org/10.62922/4cbffc.cp133
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Parkinson's Disease (PD) is a progressive neurodegenerative disease that significantly impacts on individual quality of life. Although there is no cure and treatment is continuous, it can also be modified according to the patient's progression and response. The disease includes non-motor symptoms that may lead to dementia and motor symptoms which can compromise daily activities such as walking, speaking, and swallowing. In view of the repercussions on the patient’s life, in 2019, more than 8.5

million individuals with PD reported disabilities (1). The treatment often involves drugs sensitive to interactions, potentially affecting treatment quality and patient safety (2). In this context, the extension project of the Faculty of Pharmacy at the Federal University of Rio Grande do Norte (UFRN), in partnership with a Neuroscience Center specialized in rehabilitation at the same state, developed pharmaceutical guidance actions to PD.

Aim

Develop pharmaceutical guidance actions with pharmacy undergraduates and professors for public health care in Parkinson's disease, integrating university and service.

Methods

Health professionals, professors, and students collaboratively developed their skills as health promoters in the multi-professional team at the Center for Neurosciences Specialized in Rehabilitation through a partnership with the Extension Project titled "Pharmacotechnics applied to pharmaceutical care in Parkinson's in the SUS: an integrated university extension experience in the Pharmacy course" of the Pharmacy undergraduate course at UFRN. Guided by academic literature, database, and expertise of the university professors, worksheets were developed to better objectify care, as well as educational materials aimed at improving treatment adherence and the rational and effective use of medicines.

Results

The health care provided to Parkinson's patients has proved to be of significant importance in reducing drug interactions and adverse effects. Adequate pharmaceutical guidance has proved effective in terms of the correct, rational and safe use of the drugs involved, especially levodopa. In addition, the approach has also made pharmacotherapy more engaging and personalized for patients and their companions. In this sense, some strategies were essential, such as the use of playful and easy-to-read leaflets, helping to improve understanding of pharmacotherapy. There was guidance on the care that should be taken with medicines and patients expressed their routine with the use of their medicines, with doubts and dissatisfaction. Incorrect use of medicines was identified, as well as potential drug interactions and adverse reactions for patients with polypharmacy. This project is extremely important as an opportunity for pharmacy students at a public university to develop skills and competencies in pharmaceutical care for the benefit of the SUS and for their professional future

Discussion

Given the problem of Parkinson's disease, it is estimated that there is a prevalence of 100 to 200 cases per 100,000 inhabitants (3). From this perspective, the Ministry of Health included it in the creation of the Strategic Action Plan for Tackling Chronic Diseases and Non-Communicable Diseases in Brazil, 2021-2030 (DANT Plan), as it is considered a CNCD (Chronic Non-Communicable Disease) (4). It is essential to provide care through quality health services. Through its multi-professional team, the Specialized Rehabilitation Centre provides care exclusively for users of the Unified Health System (SUS) in the Rio Grande do Norte. Parkinson's disease is part of the focus of scientific development and the

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

multiprofessional residency in the center. The extension program made it possible for professors and students of Pharmacy course from the Federal University of Rio Grande do Norte (UFRN) to develop care for patients through pharmaceutical guidelines made after medical care with the neurologist. With this experience, one could witness the importance of the pharmacist in the interprofessional care team, playing a crucial role in comprehensive patient care, therapeutic effectiveness, and treatment adherence, resulting in improvement patients' quality of life.

Keywords

Parkinson'S Disease; University Extension; Pharmaceutical Guidance.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Use of Clinical Simulation as an Educational Strategy in the Communication of Health Errors: Experience in a Postgraduate Course

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About this experience report

DOI: 10.62922/4cbffc.cp134
Link: https://doi.org/10.62922/4cbffc.cp134
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Effective error communication is one of the challenges to ensuring patient safety in the hospital environment, and is a goal to be achieved by the interdisciplinary team(1). Working in the healthcare environment requires a broad development of professional skills, because in addition to knowledge of the specific subject, it is also necessary to develop teamwork, have the right attitude and be proactive(2). The Brazilian Ministry of Health, through the National Patient Safety Program, has defined the importance

of effective communication as a patient safety goal, reaffirming the importance and need to include this topic in education, from the technical level to higher education(3). In this sense, communication must be improved, as it is fundamental for the proper development of work(1). to this end, some institutions have sought innovations in teaching methodologies, such as clinical simulation(3-4). This teaching method allows students to train technical and behavioral skills, ensuring the quality and performance of the team in patient care(4). Thus, the use of simulation for teaching is an important tool to help students develop professional skills(2).

Aim

To evaluate the experiences of postgraduate students in utilizing clinical simulation for error communication in healthcare settings as an educational strategy.

Methods

This is an experience report on clinical simulation conducted at the State University of Feira de Santana. The sample consisted of 9 students enrolled in the course "Research and Clinical Practice in Intravenous and Pediatric Medication Therapy," offered by the Graduate Program in Pharmaceutical Sciences during the first semester of 2024. The students participated in theoretical classes, lectures, and workshops. For the simulation scenario, the students were divided into two groups: the first group developed the case to be simulated, and the second group enacted the situation. In the created simulation scenario, an intravenous medication was administered to a patient with a prior history of allergy to the drug. During the medication administration, the patient developed a severe allergic reaction and was stabilized by the medical team. However, despite intervention, the patient developed irreversible neurological sequelae and was transferred to the institution's Intensive Care Unit, making it necessary to communicate this error to the patient's family. The primary learning objective of the simulated scenario was to communicate the occurrence of an error in a healthcare setting. The secondary objectives were to communicate the error appropriately, manage conflicts during communication, and ensure that the patient's family received all necessary support for recovery. During the simulation, a volunteer student communicated the error to the family, represented by two actresses trained for this scenario. The scenario development lasted approximately 15 minutes, followed by a 40-minute debriefing session, structured by the students who wrote the scenario.

Results

The scenario was conducted in a classroom. Although the scenario was of low fidelity, the students showed immersion in the simulation. During the debriefing, the students described the scenario performed, then expressed their feelings and reactions to what occurred. At this point, the positive aspects observed during the scenario were highlighted, followed by a reflection on areas needing improvement. Additionally, the students discussed their experiences with the subject in their professional practice and how they could apply the learned concepts in clinical practice. In this context, the application of clinical simulation as a teaching-learning method proved to be promising and effective. At the end of the course, an evaluation was conducted, in which the students mentioned that

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

during the simulation, nervousness, insecurity, and anxiety were similar to those experienced in real practice, emphasizing that the clinical simulation experience was excellent. Thus, the inclusion of clinical simulation in the multiprofessional educational system is recommended, as it strengthens the technical-scientific knowledge of the participants, provides greater confidence in practice, and contributes to the improvement of professional practice.

Discussion

The implementation of a clinical simulation scenario on error communication in healthcare was a positive experience for both students and teachers, both in terms of learning and satisfaction. The debriefing strategy is considered one of the most important phases in clinical simulation, as the facilitator guides the student in reflecting on the experience during the simulation, helping them understand their performance, make decisions, and assess their competence in the scenario(5). The feelings experienced by the students during the activity were in line with research conducted in Rio Grande do Sul, where students were initially apprehensive; however, as the activity progressed, learning, content retention, and connection with practice were observed(6). This teaching method in the course proved to be effective, providing quality learning, ensuring greater safety, and better understanding of the real work environment. Therefore, new studies are needed to explore this new teaching approach, enhancing the training of future professionals and equipping them for critical, creative, and safe practice.

Keywords

Health; Communication; Simulation Training; Education.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Improving Critical Care Pharmacy: the Modified Fast Hug Maidens Approach

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About this experience report

DOI: 10.62922/4cbffc.cp135
Link: https://doi.org/10.62922/4cbffc.cp135
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The original FAST HUG mnemonic was introduced in 2005 as a standardized tool to assist ICU physicians in the care of critically ill patients. In 2011, it was expanded to FAST HUG MAIDENS with the aim of identifying drug-related problems (DRPs) in the ICU (1). In the FAST HUG MAIDENS mnemonic: “F” stands for Feeding; “A” for Analgesia; “S” for Sedation; “T” for Thromboembolic prophylaxis; “H” for Hyperactive or Hypoactive delirium; “U” for Ulcer prophylaxis; “G” for Glucose control; “M” for Medication reconciliation; “A” for Antibiotics or anti-infective agents; “I” for Indications for medications; “D” for Drug dosing; “E” for Electrolytes, hematology, and other laboratory tests; “N” for No drug interactions, allergies, duplications, or side effects; and “S” for Stop dates (1). Several studies have demonstrated the positive impact of implementing FAST HUG MAIDENS to identify DRPs by clinical pharmacists (2-4). Despite its established utility, there are additional essential factors for identifying DRPs that are not included in the mnemonic.

Aim

To describe the experience of modifying the FAST HUG MAIDENS mnemonic by incorporating essential factors identified by the intensive care pharmacist through clinical practice.To modify the FAST HUG MAIDENS mnemonic by incorporating essential factors identified by the intensive care pharmacist through clinical practice.

Methods

This is an experience report of the developing the modified FAST HUG MAIDENS. A review of the primary pharmaceutical interventions conducted in a 20-bed adult ICU was performed. This ICU was situated in a medium-sized hospital specializing in cardiology. Following the review, the main causes of drug-related problems (DRPs) not covered by the original FAST HUG MAIDENS mnemonic were identified. These issues were then listed, categorized, and incorporated into the revised mnemonic.

Results

The four main factors considered included oral prophylaxis, ocular prophylaxis, intestinal elimination and fluid balance. Additionally, some subcategories were also included. Medication reconciliation (designated as “M”) was divided into two categories: “reconciled” and “unreconciled.” Antibiotics or anti-infectives (designated as “A”) were categorized into eight groups: “name of medication,” “start date,” “dose and posology,” “hepatic dysfunction,” “obesity,” “burn injuries,” “hemodialysis,” and “adjustments.” Drug interactions, allergies, duplications, or side effects (designated as “N”) were subdivided into five categories: “drug interactions,” “therapeutic duplicity,” “adverse reactions,” “medications via feeding tube,” and “Y-incompatibility”.

Discussion

Critically ill patients often require mechanical ventilation, which carries an associated risk of ventilator-associated pneumonia (VAP). Poor oral hygiene and prolonged mouth opening can lead to severe inflammation of the soft tissues (5). Given the increased risk of VAP in critically ill patients, coupled with inadequate oral hygiene and interventions related to the lack of chlorhexidine or cetylpyridinium, it was decided to include ‘’oral prophylaxis’’ in the treatment protocol. The use of mechanical ventilation is directly associated with the use of sedatives and neuromuscular blockers. The administration of these medications leads to decreased or absent eye opening and incomplete eyelid closure (6). This alteration in ocular function causes tears to evaporate more quickly, potentially resulting in severe damage to the corneal surface (6). The use of ocular ointments and eye drops to maintain ocular lubrication and the barrier against bacteria is essential in critically ill patients, but it is often overlooked. Due to these factors, it was decided to include "ocular prophylaxis" in the treatment protocol. The incidence of gastrointestinal (GI) motility disorders in critically ill patients ranges from 50% to 80%, significantly increasing the risk of mortality (7). These GI disorders can lead to malnutrition, bacterial translocation, sepsis, and multiorgan dysfunction. Monitoring intestinal elimination in critically ill patients is crucial but is often overlooked. Clinical pharmacists could enhance patient care by incorporating prokinetic agents and osmotic laxatives, or by discontinuing these treatments at appropriate times to mitigate adverse effects (7). Therefore, it was decided to integrate "intestinal elimination" into the treatment protocol. Fluid balance abnormalities, often secondary to the primary disease state of critically ill patients, are frequently observed in the ICU. Volume overload is associated with conditions such as acute kidney injury, prolonged mechanical ventilation, impaired mobility, and increased mortality (8). Clinical pharmacists have the potential to optimize medication dilution volumes by calculating the minimum infusion volume required (8). However, it is common for clinical pharmacists to overlook monitoring the

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

patient's fluid balance or to neglect performing minimum volume calculations. Consequently, it was decided to incorporate "fluid balance" into the treatment protocol. The subcategories included in medication reconciliation—designated as "M" (medications), "A" (antibiotics or anti-infectives), and "N" (drug interactions, allergies, duplications, or side effects)—aim to detail the factors that should be monitored. This detailed categorization makes the pharmacists' clinical reasoning extremely broad and systematic, increasing the chances of identifying DRPs. The modified FAST HUG MAIDENS allows the clinical pharmacist to perform extremely detailed and focused monitoring of the main factors related to DRPs in ICU patients. Using this tool optimizes the pharmacotherapy of critically ill patients, thereby helping to improve clinical outcomes.

Keywords

Pharmacist; Critical; Mnemonic; Pharmacoterapy; DRP.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Experience Lived in a Pharmacotherapeutic Follow-Up in Cardiology: an Experience Report in a Multiprofessional Residency

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About this experience report

DOI: 10.62922/4cbffc.cp136
Link: https://doi.org/10.62922/4cbffc.cp136
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

According to the World Health Organization (WHO), ischemic heart diseases, including Coronary Artery Disease (CAD), are among the leading causes of death worldwide. In 2019, 8.9 million deaths were

attributed to this condition (1). CAD is characterized by the complete or partial obstruction of the coronary arteries, predisposing individuals to the occurrence of Acute Coronary Syndrome (ACS), which can manifest as Non-ST-Elevation Myocardial Infarction (NSTEMI) or ST-Elevation Myocardial Infarction (STEMI) (2-3). Risk factors for the development of this pathology include advanced age, family history of heart disease, smoking, alcoholism, obesity, sedentary lifestyle, dyslipidemias, systemic arterial hypertension (SAH), and type 2 diabetes mellitus (T2DM) (4). Pharmacological therapy in these patients is essential to increase survival and reduce morbidity and mortality. The complexity of therapy requires a multidisciplinary approach, in which the clinical pharmacist can be included to ensure the safe and rational use of medications (5).

Aim

The aim of this study is to report the experience of pharmacotherapeutic follow-up of a patient admitted to a cardiology inpatient unit, conducted by a pharmacist from a Multiprofessional Health Residency.

Methods

This is a case report of the pharmacotherapeutic follow-up of a 66-year-old female patient with a history of hypertension, type II diabetes mellitus, nephrectomy, myocardial revascularization, and right coronary artery (RCA) angioplasty performed two months ago. She was on home medication consisting of Atorvastatin 40mg, Acetylsalicylic Acid 100mg, Clopidogrel 75mg, Enalapril 20mg, and Pantoprazole 40mg. The patient was referred to a cardiology reference hospital in João Pessoa-PB, and a few hours after admission, she underwent an electrocardiogram (ECG), which diagnosed an acute myocardial infarction without ST-segment elevation (NSTEMI).

Results

Initially, the medical approach involved adding nitroglycerin due to elevated blood pressure during the course of STEMI, with the aim of controlling blood pressure and alleviating ischemic symptoms. Subsequently, due to altered renal function, characterized by elevated plasma creatinine levels, and considering the contraindication for the use of ACE inhibitors (6), oral vasodilation was started with Isosorbide 20 mg and Hydralazine 50 mg. Additionally, Enoxaparin 60 mg, initially prescribed, was replaced by Low Molecular Weight Heparin (LMWH) also due to renal dysfunction. to complement the vasodilator therapy, Amlodipine 5 mg and the Beta-blocker Carvedilol 3.125 mg were added to control heart rate. The prescription also included Acetylsalicylic Acid 100 mg and Clopidogrel 75 mg to prevent platelet aggregation and coronary reocclusion, along with Simvastatin 40 mg, as its continuous use reduces morbidity and cardiovascular mortality due to atherosclerotic disease. After stabilizing the condition, the patient underwent cardiac catheterization, which revealed new obstructions. However, due to the unavailability of vascular beds, it was not possible to perform a new revascularization procedure or angioplasty, and a conservative treatment approach was chosen. as a result, the medical team decided to perform medication reconciliation for home use to make the conservative treatment effective. Consequently, simvastatin was replaced by atorvastatin 40 mg, given that the patient had a high cardiovascular risk and therefore required a high-potency statin (7). Additionally, the clinical

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

pharmacy service suggested starting prophylaxis for acute gastric mucosal injury (AGMI) with a proton pump inhibitor.

Discussion

This case highlights the importance of pharmaceutical follow-up in a hospital setting, especially for poly-medicated patients with multiple comorbidities and complex treatments. The inclusion of a pharmacist in the multidisciplinary team assists in monitoring adverse effects and the progression of clinical and laboratory parameters

Keywords

Cardiology; Dyslipidemias; Cardiovascular Diseases; Non-ST-Elevation Myocardial Infarction; Clinical Pharmacy.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Implementation of Pharmaceutical Clinical Services in a Teaching Pharmacy: Benefits and Challenges - Experience Report

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About this experience report

DOI: 10.62922/4cbffc.cp137
Link: https://doi.org/10.62922/4cbffc.cp137
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 01/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

According to Law 8.080/90, health is a fundamental right of the individual, and the state must provide conditions for its full implementation. Comprehensive therapeutic assistance, including pharmaceutical care, is encompassed within the scope of the Unified Health System (SUS) (1). Pharmaceutical care is a set of actions that aims to promote, protect, and restore health, both collectively and individually, using medication as an essential input to ensure access and its rational use (2). Therefore, in addition to the technical-managerial activities of Pharmaceutical Services and Policies, clinical assistance actions focused on patient care must be developed, with a focus on monitoring and evaluating medication use. In this context, clinical pharmacy emerges as an area of expertise that integrates knowledge and skills for specialized pharmaceutical practice, with the responsibility of ensuring the appropriate use of

medications based on patient care. Additionally, the clinical role of the pharmacist aims to optimize pharmacotherapy, promote rational medication use, and contribute to improving the patient's quality of life (3). The clinical performance of the pharmacist involves conducting pharmaceutical consultations in a pharmacy setting to address and prevent issues related to pharmacotherapy, such as drug interactions, adverse reactions, and therapeutic inefficacy. This includes prescribing over-the-counter medications, ordering laboratory tests to evaluate pharmacotherapy, creating a treatment plan in collaboration with the patient, and making referrals to other healthcare services and providers when needed (4). Clinical pharmacy is realized for the patient, their family, and the community through clinical pharmaceutical services. These services are understood as organized activities in a work process that aim to prevent diseases, promote, protect, and restore health to enhance the population's quality of life. Pharmaceutical services are provided in community phar

Aim

The main objective of this paper is to report the benefits obtained from the implementation of clinical pharmaceutical services at the Teaching Pharmacy in the Universidade Estadual do Centro-Oeste - UNICENTRO, as well as the challenges faced in this process.

Methods

The patients were interviewed from October 2023 to March 2024, through pharmaceutical consultations. Data were recorded in a pharmaceutical record prepared by the interviewers. The target audience comprised patients who regularly visited the teaching pharmacy to get continuous-use medications and who reported complaints or difficulties related to pharmacotherapy or clinical conditions. Drug interactions were checked using the online pharmaceutical encyclopedia Drug.com®.

Results

The profile of the interviewees obtained during the study period consisted mainly of patients with chronic non-communicable diseases (NCDs), over 60 years old, who were using at least one medication for continuous treatment. These medications included those for systemic arterial hypertension, diabetes mellitus, hypothyroidism, depression, and dyslipidemia. Additionally, instances of drug-drug interactions were noted. The interviewees also exhibited unhealthy lifestyle behaviors, such as inadequate consumption of fruits and vegetables, sedentary habits, and low water intake. Many patients experienced challenges in adhering to the prescribed medication dosages.

Discussion

The pharmaceutical consultation serves as a tool for pharmacists to comprehend the patient's requirements, identify any health issues, and determine the patient's health needs. This process facilitates the selection of the most appropriate pharmaceutical intervention (4). Through the clinical service of pharmacotherapy review, a comprehensive analysis of the patient's medications was conducted, encompassing various aspects, such as administration route, dosage, dosing interval, potential drug interactions, timing, and therapeutic indications (5). The presence of drug interactions

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

was noted, leading to the development of a personalized dosage regimen. Pharmaceutical interventions were implemented, specifying the name of each medication, its concentration, and the recommended timing for administration (pre or post breakfast, lunch, and dinner). Numerous patients exhibited unhealthy lifestyle behaviors, including individuals with diabetes who consume high amounts of carbohydrates, and hypertensive patients who have diets rich in sodium. Additionally, a lack of physical activity was noted in their daily routines. to address these issues, a clinical pharmaceutical health education service was implemented for these patients. According to Melo & Pauferro (2020), the process of Health Education creates conditions that extend beyond the scope of information solely related to a prescription. Education entails engaging in processes that contribute to altering individuals' attitudes and behaviors (6). Consequently, when deemed necessary, informational materials were created concerning healthy lifestyle habits. Furthermore, these guidelines were verbally communicated to patients. Several patients who were interviewed utilized insulin as a treatment for diabetes, and clinical services were provided to oversee the management of their health condition. Consequently, it was imperative to provide guidance on the proper administration of the hormone, emphasizing the importance of rotation to prevent lipodystrophy and minimize glycemic fluctuations. Additionally, instructions were given regarding the appropriate storage and disposal of sharp objects, including needles and lancets. Patients were also educated on the necessity of monitoring their glycemic levels and keeping a daily record of their values. During the study period, the primary challenges encountered in the implementation of clinical pharmaceutical services were primarily associated with the non-adherence of certain patients to follow-up consultations. This non-compliance hindered the assessment of the effectiveness of the interventions implemented. Furthermore, some patients exhibited a lack of dedication to adhering to the prescribed guidelines, citing the difficulty of incorporating them into their daily routines. However, many patients who participated in the pharmaceutical consultation demonstrated receptiveness and interest in further exploring the information presented. Consequently, the consolidation of these clinical services plays a role in enhancing the patient's increasing confidence in healthcare professionals, thereby patient, strengthening the relationship. as a result, the commitment to welfare has been reinforced; leading contributes enhancements in improving clinical outcomes.

Keywords

Pharmaceutical Care; Clinical Pharmacy.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Home Pharmacological Approach: Use of Genogram, Ecomap and Therapeutic Itinerary in an Elderly Patient

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About this experience report

DOI: 10.62922/4cbffc.cp138
Link: https://doi.org/10.62922/4cbffc.cp138
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

In the Unified Health System (SUS), the use of instruments such as genogram, ecomap and therapeutic itinerary allows a complete understanding of the patient, encompassing the principle of comprehensiveness, which goes beyond the current clinical condition (1). The genogram, for example, maps the family tree, identifying disease patterns and relevant family dynamics (2). The ecomap illustrates social and environmental relationships, evaluating social and everyday dynamics (3). The therapeutic itinerary offers an understanding of the trajectories followed by patients in the health system, facilitating the identification of possible problems (4). Furthermore, the home visit allows the observation of actions that might not be noticed in an outpatient environment, in addition to strengthening the bond with the patient (5). Adequate assessment and effective medication management are essential to ensure treatment effectiveness and patient safety (6). Pharmaceutical

intervention in the home environment can significantly reduce the risk of complications and improve patients' quality of life. In this context, care, which includes health education and the reorganization of medications, becomes essential for therapeutic success and the well-being of the elderly person cared for. This experience report refers to home care provided to an elderly patient in the city of Criciúma, during the internship subject.

Aim

Report the actions and interventions carried out during a home care internship for an elderly patient resident in the city of Criciúma, using the genogram, ecomap and therapeutic itinerary instruments to offer comprehensive and humanized care, highlighting the importance of pharmaceutical care in promoting adherence to the treatment.

Methods

The internship was carried out with the patient R.L.R.F., 71 years old, resident in Criciúma, Santa Catarina. During home visits, a genogram, ecomap and therapeutic itinerary were used to collect data on the patient's health, family dynamics and experiences. The genogram mapped genetic diseases and family patterns, the ecomap detailed social and environmental relationships, and the therapeutic itinerary documented the patient's health trajectory. To improve the patient's quality of life and organization of medications, some actions were implemented. Initially, medications used daily were separated and expired medications were collected for correct disposal. The patient also donated sealed medicines that she no longer used. Guidance on the importance of following medical prescriptions was provided to the patient, in addition to guidance on healthy eating, in the case of a hypertensive patient. A suitable box was provided to store the medicines in a single location, preserving their ideal conditions and avoiding exposure to heat and sunlight. The patient received instructions on the correct storage of medications and the risks associated with improper storage. Furthermore, a group from the University of the Extreme South of Santa Catarina (Unesc) was contacted to offer alternatives for the patient's joint pain and promote socialization. It was recommended to exercise memory by creating lists to carry out grocery shopping and daily tasks, only checking the list at the end. These actions aim to provide better organization and quality of life for the patient, in addition to good adherence to pharmacological treatment.

Results

Through an interview and analysis of medical records, the patient presents pathologies such as systemic arterial hypertension, vertigo, asthma, gastroesophageal reflux disease and suspected rheumatoid arthritis. The genogram identified a history of respiratory diseases in the family and services related to the smokehouse, which could justify the clinical condition. The ecomap showed strong ties with close family members and the church community. The therapeutic itinerary highlighted several places frequented for the reported health conditions. The use of clinical pharmacy instruments revealed that the patient has a good understanding of the treatment of her diseases. All treatments are carried out in the public sphere, with medicines purchased by family members at the neighborhood's basic health unit,

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

and the asthma medicine is obtained at the University of the Extreme South of Santa Catarina (Unesc). The patient is cared for by both general doctors and specialists. The main difficulty identified is transportation, as the patient depends on her family for transportation and, due to their work, sometimes avoids seeking care so as not to feel like they are bothering her. She is lucid, knows how to read and write, and demonstrates a good understanding of the importance of following the treatment at the proposed times and days, indicating that she carries out the treatment correctly and has no difficulties in this aspect. The patient's biggest complaint is pain, for which she is waiting to see a specialist for diagnosis. The patient was retired due to disability due to carpal tunnel syndrome, in addition to suffering from pain in the hip and joints, suspected of having rheumatoid arthritis.

Discussion

Home visits, associated with the use of tools such as genogram, ecomap and therapeutic itinerary, enabled an approach that promoted completeness and equity for patient R.L.R.F. These instruments allowed an in-depth perception of the complexity of the patient's health conditions and the social and family factors relevant to her treatment. The genogram revealed significant genetic patterns and family contexts, such as a history of respiratory diseases and exposure to harmful environmental factors, which are important for understanding the patient's hypertension and asthma. The presence of respiratory diseases in the family can predispose individuals to similar conditions, and environmental exposure, such as the patient's work in a smokehouse, can exacerbate this condition (7). The ecomap highlighted the importance of the patient's social support networks, including strong ties with family members and members of the religious community. These bonds positively influence their leisure and general well-being, which also contributes to treatment adherence (8). Furthermore, the habit of caring for plants and carrying out domestic activities, which keeps the patient busy and moving, has beneficial effects on her health. The therapeutic itinerary highlighted the complexity of the patient's interactions with the health system, highlighting the variety of services used and the need for specialized medical monitoring. Dependence on family members for transportation and the perception of being a nuisance can negatively impact treatment adherence and the patient's general health. Pharmaceutical intervention and medication reorganization were effective, promoting safe medication storage and better organization. Guidance on the importance of following medical prescriptions and proper storage of medications are essential to ensure the effectiveness of treatment and patient safety (9). The recommendation to exercise memory and the introduction of lists for daily tasks aim to help with organization and promote the patient's autonomy. Strategies to improve memory and organization have demonstrated benefits in quality of life and management of chronic conditions (10). In conclusion, the home care experience demonstrated that the integrated use of a genogram, ecomap and therapeutic itinerary provides a more detailed understanding of the patient's health conditions and social context, allowing for more individualized care. The approach favored adherence to treatment and also improved the patient's quality of life, highlighting the importance of comprehensive and humanized care in the Unified Health System (SUS).

Keywords

Pharmacy; Health; Polypharmacy; Elderly; Home.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Transformation Process of Pharmaceutical Oral Solid Dosage form of the Tyrosine Kinase Inhibitor (Tki) Ponatinib (Iclusig®) Into a Suspension for Administration Through Enteral Tube

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About this experience report

DOI: 10.62922/4cbffc.cp139
Link: https://doi.org/10.62922/4cbffc.cp139
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 30/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Patients undergoing treatment with oral antineoplastic chemotherapy may experience a change in their clinical condition that results in the loss of the oral route, requiring the passage of a tube, which becomes the only possible route for administering chemotherapy, given the unavailability of some of these drugs in intravenous form. In this context, the pharmacist is responsible for transforming the pharmaceutical form so that chemotherapy can be administered by enteral tube, respecting the

physicochemical properties of the drug and following the good practices for handling chemotherapy drugs, thus promoting the safe administration of the drug.

Aim

To describe the transformation of the Ponatinib (Iclusig®) coated tablet into a suspension to administration through enteral tube, with its respective pH and dispersion time, as well as the outcome for the patient in relation to episodes of emesis that led to loss of the oral route.

Methods

The transformation of the pharmaceutical form was based on a review study about the handling of tyrosine kinase inhibitors (TKIs), which in turn was based on recommendations from pharmacokinetic and bioequivalence studies that confirmed similar pharmacokinetic parameters between unlicensed liquid pharmaceutical forms and oral solid forms[3]. For the pharmaceutical form transformation process, a 20mL oral dispenser was filled with 15mL of lemon juice whose pH was previously measured, and according to the recommendations the 15mg Ponatinib (Iclusig®) tablet was dissolved inside the oral dispenser and its dissolution time recorded. This process was repeated for 5 days. The entire procedure was carried out in a laminar flow cabinet, following good chemotherapy handling practices.

Results

The dissolution time and pH of the Ponatinib (Iclusig®) tablet suspension were measured over 5 days. The dissolution time and pH measured were respectively: 40 seconds at pH 2.5 on d1, 01 minute and 40 seconds at pH 2.37 on d2, 01 minute and 10 seconds at pH 1.99 on d3, 18 seconds at pH 2.5 on d4, and 01 minute at pH 2.75 on d5. The average time taken for the drug to dissolve was 57.6 seconds at an average pH of 2.42. A suspension was obtained for immediate administration via enteral tube.

Discussion

The patient in question was receiving his diet via a nasoenteral tube, but his oral route was affected by episodes of vomiting which intensified after oral administration of Ponatinib (Iclusig®), jeopardizing therapy and resulting in the impossibility to administer medication through oral route. The patient was then given Ponatinib suspension (Iclusig®) via nasoenteral tube. During the 23 days following the administration of the medication via tube, despite the persistence of nausea, the patient did not experience any more episodes of vomiting. There were no episodes of tube obstruction in any of the administrations. Based on the study carried out to transform the pharmaceutical solid form into a suspension, it was possible to calculate the time and average pH for the dissolution of the 15mg Ponatinib (Iclusig®) tablet. Studies describing the transformation of pharmaceutical solid forms into liquid pharmaceutical forms are scarce when it comes to antineoplastic chemotherapy. The limited data available in the literature demonstrates the need for studies that provide adequate guidance for professionals when faced with the demand for enteral tube administration that can arise at any time, making it difficult to continue antineoplastic therapy.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Inhibitor, Tyrosine Kinase; Enteral Nutrition.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Training on High Vigilance Medicines as a Refresher on the Safe Use of Medicines - an Experience Report

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About this experience report

DOI: 10.62922/4cbffc.cp140
Link: https://doi.org/10.62922/4cbffc.cp140
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 30/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Patient safety can be defined as reducing the risk of unnecessary harm related to healthcare to an acceptable minimum. In the context of hospital pharmacy, the classification of high vigilance drugs (HVM) and LASA drugs (Look a Like and Sound a Like) is extremely important. HVM are drugs with a high risk of causing negative repercussions for patients' health, and LASA drugs are those with similar pronunciation, writing, and packaging, with a high possibility of generating dispensing and medication errors. Failures in the processes of using these health technologies can have serious consequences,

leading to poor prognosis and risks to patient safety (1). In this context, the National Patient Safety Program proposes to promote training processes in patient safety for health managers, professionals who work directly and indirectly in health care and health surveillance professionals (2).

Aim

To report on the experience of training professionals in a hospital pharmacy on the classification of LASA and HVM medicines.

Methods

This is an observational study in the form of an experience report. Three training sessions were held in a satellite pharmacy of a teaching hospital, targeting professionals working in drug dispensing and clinical pharmacy professionals, during the daytime on May 6, 8, and 9, 2024. Visual material was used with definitions, demonstrating the identification of HVM and LASAs in medical prescriptions and in the computerized system. A quiz was administered as a pre-test to assess the participants' prior knowledge.

Results

The training was effectively attended by 25 employees from the Hospital Pharmacy and Clinical Pharmacy dispensing sectors, 10 (40%) on day 06 and 15 (60%) on days 08 and 09. The pre-test was applied to 25 (100%) participants. With regard to the professional categories trained (n=25), 10 (40%) were resident clinical pharmacists, 4 (16%) pharmacists from the logistics sector, 3 (12%) pharmacy technicians, 1 (4%) administrative assistant, and 7 (20%) warehouse workers. The results of the pre-tests showed that 24 (96%) of the participants knew the meaning of the acronyms HVM and LASA. However, 1 (4%) did not answer the questions properly.

Discussion

The pre-test showed that the majority of professionals working in the service had prior knowledge of HVM and LASA. However, the subject is constantly in need of updating and continuing education since it has a direct impact on medication errors and patient safety. The training was therefore attended by all employees to make a positive contribution to their training process. The training included an expository moment in which the terms MAV and LASA were explained, with demonstrations of the drugs commonly classified under these criteria, and, afterwards, there was a moment for employees to clarify their doubts on the subject. This intervention is important, considering that permanent education is the pedagogical concept, in the health sector, for making organic relationships between teaching and actions and services, and between teaching and health care (3).

Keywords

Patient Safety; Medication Errors.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmaceutical Care and Multidisciplinary Work in Mental Health Care for Patients at a University Hospital: Experience Report

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About this experience report

DOI: 10.62922/4cbffc.cp141
Link: https://doi.org/10.62922/4cbffc.cp141
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 30/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

With the implementation of Law nº. 10.216/2001, which establishes the rights of people with mental disorders, several changes have occurred in mental health care over the years (1). Currently, biopsychosocial aspects are considered when structuring treatment. In view of the indiscriminate use of medications, inappropriate prescriptions and the risk of adverse reactions (2), pharmaceutical care is considered an essential service in ensuring comprehensive health, along with other services provided by professionals who make up the multidisciplinary team (3-4).

Aim

To report the experience of expanding mental health care for patients admitted to the surgical clinic.

Methods

This is a descriptive study of the experience report type in the surgical clinic of a University Hospital (HU) in Paraíba, based on the perception of the team of multi-professional residents who are part of the Multi-

professional Residency in Mental Health program - RESMEN. The experience addressed aspects related to the mental health of patients before and after surgical procedures, multi-professional work and health education strategies.

Results

It was possible to observe several issues related to mental suffering, among the possible motivations are waiting in the pre-operative period, hospital discharge of patients in long-term hospitalization, distance from the hospital in their hometown, concerns about home and family demands, between others. In addition, we found difficulty in dealing with oncological diagnoses and palliative care. On the other hand, we noticed that health professionals also showed signs of illness and needed mental health care, and they also reported some difficulty in dealing with people with mental disorders. With the aim of expanding mental health care in these services, the team of residents used the active listening tool, from this, in pharmaceutical anamnesis, information was collected about the user's life history, their health condition and medication. continuous use, in this way medication reconciliation was carried out and in qualified listening, issues related to mental health were noted. Guidance was provided on the importance of rational use of medications, as well as the importance of attending other health services, such as Unidade de Saúde da Família (UBS), Centro de Atenção Psicossocial (CAPS) and others. In the case discussion meetings, the multi-professional team pointed out issues and therapeutic management strategies related to their professional core, in order to solve health-related problems and ensure patient safety.

Discussion

It can be seen that there is a need to expand mental health care in hospital health services. Searching for new strategies to implement this care is still a challenge, however, it is possible to note that with light technologies, such as qualified listening, treatment tends to be more humanized and less painful. In this way, in the space of multi-professional team meetings, it is possible to collect information about the patient and expand health care. In this sense, the presence of a clinical pharmacist on the team is of great importance, since it will ensure greater patient safety related to drug therapy and, together with other professionals, comprehensive health care (5).

Keywords

Mental Health; Clinical Pharmacy Service.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Health Education: Conversation Circle on Diabetes, an Experience Report

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About this experience report

DOI: 10.62922/4cbffc.cp142
Link: https://doi.org/10.62922/4cbffc.cp142
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 29/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Health education is related to the prevention of complications, enabling patients to live better with their health problems. Various studies have shown the importance of health education in different groups with diverse socio-economic and cultural characteristics (1). The use of educational materials as resources in health education has become an important ally in the teaching-learning process, especially in the therapeutic intervention of chronic diseases (2). Chronic non-communicable diseases have been on the rise in Brazil and around the world, and diabetes mellitus stands out among these. The treatment of diabetes is aimed at maintaining blood glucose levels through the use of oral medication and/or insulin, self-monitoring of blood glucose levels, adequate diet and regular physical activity (3). The need to develop teaching activities or health education practices aimed at patients with diabetes and their families is related to the prevention of complications through self-management and enables patients to live better with the disease. The goals of diabetes education are to improve metabolic control, prevent acute and chronic complications, and improve quality of life at a reasonable cost (1).

Aim

The aim of the conversation circle is to promote greater adherence to treatment and control of diabetes through health education. This strategy tends to: help empower patients over decisions related to their own health, encourage the recognition of health education as a fundamental part of treatment, make patients aware of their health condition and promote healthy lifestyle habits based on the articulation of technical and popular knowledge.

Methods

This paper is a report on the experience of health education based on the activity 'Round of Conversations about Diabetes' at a Basic Health Unit in the municipality of Três Lagoas - MS, carried out by the unit's pharmacist. The activities took place from September 2023 to November 2023. The topics covered during the activities were quite diverse, including: demystifying nutrition (myths and truths about nutrition); how the emotional impacts on treatment; the impact of physical activity on treatment; and the importance of adherence to drug therapy. These discussions were aimed at working on individual or collective perceptions of health and experiences, encouraging patients to seek lifestyle changes and helping patients to improve their health status. In addition to the pharmacist, a team made up of different professionals was also present to mediate the meetings: a nutritionist, psychologist and physical educator. All patients with diabetes in the health unit's area were invited to take part in the meetings. The conversation circles were designed to promote the exchange of experiences between patients and health professionals, which helps to strengthen patients' understanding of their health condition. During the meetings, guidance folders on diabetes were distributed to sensitize patients to understanding the different aspects and characteristics of the disease. This measure helped to reinforce the importance of changing lifestyle and the impact of this action on the patient's health.

Results

It was possible to notice that there was good interaction among the participants, who were interested and collaborative in taking part, reacting positively to the questions and interactions requested by the speakers. There was an exchange of knowledge and experience between the participants and the health professionals involved. The meetings also helped to clarify doubts about the pathophysiology of diabetes, treatment and patient self-care.

Discussion

From the meetings held, it was possible to perceive the importance of developing strategies and actions that promote health education, especially for patients with chronic diseases such as diabetes. It is therefore possible to state that these meetings allow patients to improve their knowledge about the disease and, consequently, improve adherence to treatment, as well as the patient's understanding of their clinical condition.

Keywords

Health Education; Diabetes; Conversation Circle.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmaceutical Care in a Basic Health Unit in the Municipality of Três Lagoas – MS: Experience Report

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About this experience report

DOI: 10.62922/4cbffc.cp143
Link: https://doi.org/10.62922/4cbffc.cp143
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 29/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

According to the Brazilian Consensus on Pharmaceutical Care, the aim of Pharmaceutical Care is to increase the effectiveness of drug treatment by detecting Pharmacotherapy-Related Problems (PRP). It involves health education, pharmaceutical guidance, dispensing, pharmaceutical care and pharmacotherapeutic follow-up, the systematic recording of activities, measurement, evaluation of results and requires professionals with knowledge, commitment and responsibility that can come from the professional's training and experience(1). Currently, the pharmacist has become co-responsible for the patient's well-being and has worked to ensure that pharmacological therapy does not cause an avoidable problem. This is extremely important, since adverse drug events are responsible for major losses (financial or life) and are considered an emerging pathology(2). Pharmaceutical care prioritizes pharmacotherapeutic guidance and monitoring, focusing on the direct relationship between the patient and the pharmacist. Pharmaceutical care is already a reality in most developed countries and has been shown, in patients with chronic pathologies, to reduce illnesses and costs for the health system, so the implementation of pharmaceutical care is not a cost but an investment(3).

Aim

Carry out pharmacotherapeutic monitoring of the selected patients in order to improve adherence to pharmacotherapy and their quality of life.

Methods

This is an experience report, which describes the pharmacotherapeutic monitoring of patients at a Basic Health Unit in the municipality of Três Lagoas - MS, carried out by the unit's pharmacist. The service is scheduled for each patient, in a private room. Patients are scheduled for the afternoon, after 2pm, due to the flow of appointments at the Health Unit. For some urgent cases, patients can also be seen on demand. The morning is reserved for logistical, administrative and technical-pedagogical activities. All the patients seen had their data saved in electronic medical records, the same that all health professionals use in the municipality. The following criteria were used to select the patients: elderly patients; patients who use four or more medicines and have at least one additional risk factor for pharmacotherapy problems; patients who have more than two diagnosed chronic diseases; patients who have been hospitalized in the last six months; patients with doubts or problems about the use of medicines; patients with treatment adherence problems; patients who have access difficulties; patients who have prescriptions from two or more different doctors; patients who pick up their medicines at two or more pharmacies; patients who have previously identified problems with the effectiveness or safety of their treatments. The aim of pharmaceutical care is to promote adherence to pharmacotherapy. During the pharmaceutical anamnesis, the PRP were mainly assessed: need/indication, effectiveness, safety and adherence.

Results

Two hundred and six pharmaceutical consultations were carried out between March 2023 and November 2023, of which one hundred and twelve were returns. On average, one problem related to pharmacotherapy was found per patient, and among the PRP found, the most recurrent was related to adherence to pharmacotherapy. Eleven referrals were made to other health professionals, eighty interventions in the form of advice or information about the health problem and eighteen suggestions for adapting pharmacotherapy.

Discussion

The PRP found, especially adherence, demonstrate the importance of the pharmacist's work in health units. Even in the face of the challenges and difficulties in making pharmaceutical consultation viable in the municipal system, it is necessary to recognize that there have been significant advances in the relevant legislation and, mainly, it is possible to see significant improvements in patients with chronic diseases when accompanied by the pharmacist.

Keywords

Pharmaceutical Care; Prf; Pharmacist.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Medication Reconciliation - the Clinical Pharmacist's Role in the Process Expansion

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About this experience report

DOI: 10.62922/4cbffc.cp144
Link: https://doi.org/10.62922/4cbffc.cp144
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 29/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Medication reconciliation is an activity conducted by the multidisciplinary team in which a comparison is made between the medications previously used by the patient and those prescribed during hospital admission (1,2). Medication reconciliation aims to identify, resolve, and understand intentional and unintentional discrepancies related to medications during care transitions (2). Medication reconciliation plays an effective role in addressing discrepancies between hospital prescriptions and prior medication use, reducing errors (3). The increased frequency of medication reconciliations enhances the continuity

of pre-admission treatments, minimizing the risk of unnecessary interruptions in medication therapy and optimizing pharmacotherapy according to clinical evaluation (4).

Aim

To evaluate the number of reconciled patients in the years 2022 and 2023 with the institutional projects defined as inclusion criteria for medication reconciliation process at a private hospital in Porto Alegre. to compare the number of patients reconciled and the total number of eligible patients for reconciliation according to the adopted criteria between 2022 and 2023.

Methods

In this study, we analyzed data collected through the performance indicators of the Clinical Pharmacists team, based on reconciliation services provided to patients admitted to the internal medicine wards of a private hospital in Porto Alegre, between January 2022 and December 2023. The distribution of patients reconciled in 2022 and 2023 was carried out across various institutional projects developed by the hospital's team of clinical pharmacists, that serve as criteria for medication reconciliation. The data was categorized into four distinct projects (Dysglycemia, Patient´s Medications, Top Cardio and Pharmaceutical Care Bundle) and analyzed by Microsoft Excel (Microsoft Corporation, 2016).

Results

In 2022, all reconciled patients fell under the category of Dysglycemia, because this was the sole criterion used for medication reconciliation for that year. In 2023, medication reconciliation efforts were concentrated in three new projects (Patient´s Medications, Top Cardio and Pharmaceutical Care Bundle). In 2022, out of 334 eligible patients, 279 were reconciled, representing 83.5% of the total eligible patients. However, in 2023, out of 1,284 eligible patients, 1,140 were reconciled, representing 88.8% of the total eligible patients. The total number of reconciled patients increased by 308% in 2023 and the percentage of reconciled patients relative to the total number of eligible patients increased from 83.5% in 2022 to 88.8% in 2023. The majority of the reconciled patients in 2023 fell under the Patient´s Medications category, comprising 51% of the total reconciliations. This indicates a significant focus on ensuring accurate medication and ongoing treatments records for more than half of the patients. The second largest category was Dysglycemia, accounting for 42% of the reconciliations. This suggests a substantial effort in addressing medication discrepancies related to glycemic control. The Top Cardio category included 6% of the patients, reflecting reconciliation efforts targeted at cardiovascular conditions. Finally, the Pharmaceutical Care Bundle category, representing 1% of the total reconciliations, indicates a minimal but specific focus on this particular instrument for inpatient follow-up by clinical pharmacists.

Discussion

In 2023, medication reconciliation efforts were distributed across various institutional projects. The data demonstrates that the new inclusion criteria applied in 2023 increased the total number of patients eligible for medication reconciliation by the Clinical Pharmacist's team. Although the total number of

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

eligible patients nearly quadrupled, the Clinical Pharmacists group also increased the percentage of patients reconciled, ensuring the quality of service was maintained. Medication reconciliation is a multidisciplinary process that helps maintain patient's pharmacotherapy during hospital admission. The impact of the adopted measures ensured the expansion of the medication reconciliation project, with four times increase in the number of reconciled patients by the Pharmacist's team from 2022 to 2023, thereby promoting safety in the transition of care. This process expansion highlights the institution's strategic approach to medication safety and patient care.

Keywords

Hospital; Medication; Reconciliation; Pharmacist; Projects.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Elderly Group in Primary Care: Conducting a Health Action Focused on Pink October with an Emphasis on the Importance of Comprehensive Health Care

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About this experience report

DOI: 10.62922/4cbffc.cp145
Link: https://doi.org/10.62922/4cbffc.cp145
Type: Experience Report.
Area: Clinical Pharmacy and Pharmaceutical Care.
Received: 25/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The color pink marks the month of October, addressing the theme of Pink October, which focuses on raising awareness about breast cancer prevention (1). During this month, efforts are made to educate the population, especially women, about the importance of mammography and self-examination, as well as comprehensive and multidisciplinary health care.

Aim

To report the experience of conducting a health education activity in reference to Pink October, aimed at the Elderly Group of a Family Health Center (CSF) in Sobral, Ceará.

Methods

This is an Experience Report on the implementation of a health activity emphasizing the importance of breast cancer prevention. The strategy involved health education focused on health promotion and disease prevention, carried out by Family Health residents, including professionals in Pharmacy, Nutrition, and Physical Education, with the support of the Academic League of Clinical Pharmacy (LAFAC) from the INTA University Center – UNINTA. The activity involved 35 elderly participants, mostly women, and was divided into four phases: Welcoming Session: Conducted by the Popular Art Group, Discussion Session: Led by the residents, focusing on the theme, Health Screening and Counseling: Blood pressure and blood glucose measurements, along with pharmaceutical guidance provided by LAFAC, Collective Dance Session: Conducted by an invited Physical Education professional.

Results

Each phase of the activity allowed for the theme to be addressed from different perspectives. LAFAC emphasized pharmaceutical guidance based on the observed parameters of each participant, under the supervision of the resident pharmacist, highlighting how these factors can affect overall health and the need for comprehensive and multidisciplinary follow-up by Primary Care professionals. Additionally, there was clear satisfaction among participants with the services provided, and gratitude for the good care and guidance from the professionals. Many participants informally expressed the need for such activities for their physical and mental well-being, feeling cared for by the multidisciplinary team.

Discussion

Activities like this play a fundamental role in positively impacting the health of users of the Unified Health System (SUS), improving their quality of life and strengthening professional-user bonds. This contact is essential for good pharmacotherapeutic follow-up and comprehensive care of the population. Moreover, as students, this interaction with the community was enriching and fundamental for academic formation, providing greater insight into the needs and desires of SUS users, the importance of using accessible language for everyone, and experiencing genuine and warm gratitude during the service provided.

Keywords

Health Education; Primary Attention; Guidance.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Role of Centro De Estudos Do Medicamento (Cemed) in Health Informatics and Education: a Teaching Experience Report

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About this experience report

DOI: 10.62922/4cbffc.cp146
Link: https://doi.org/10.62922/4cbffc.cp146
Type: Experience Report.
Area: Health Informatics.
Received: 28/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

The Centro de Estudos do Medicamento (Cemed) serves as an academic organization within the Departamento de Farmácia Social of Faculdade de Farmácia - Universidade Federal de Minas Gerais (UFMG), dedicated to advancing knowledge and promoting safe medication use. Within the context of health informatics, Cemed brings together technical and scientific information on its social networks, in addition to offering a service which answers questions from both health professionals and non-specialized individuals regarding the use of medications. Established in 1991, its mission encompasses

teaching, research, and community outreach in the fields of Drug Utilization Studies, Pharmacoepidemiology, and Pharmacovigilance (1). Structurally, Cemed operates through three core interests: dissemination of scientifically grounded, unbiased medication information; professional development in pharmacotherapy; and conducting research in the aforementioned areas. This multifaceted approach allows Cemed to cater to the needs of the university community, healthcare professionals, and the public at large, fostering a culture of informed medication use and patient safety. The construction of academic knowledge takes place in an environment where teaching, research and extension combine themselves to stimulate the constitution of critical awareness in students. For that, Cemed has an important role to the education of students when it allows them to read and discuss scientific articles, exploring new topics that may generate further insights into medications to be disseminated. These explorations aim to assess the risk-benefit relationship of specific medications, while also serving as a platform for learning about clinical study designs and reviewing concepts in epidemiology and pharmacoepidemiology.

Aim

Utilizing a Prescrire review on drugs to avoid in 2024 as a guide, our objective was to find and examine clinical studies that supported the safety warnings on drugs listed on Prescrire's article.

Methods

We accessed Anvisa's (Brazilian Health Regulatory Agency) website to delimitate our investigations on drugs that were registered in Brazil. Pubmed was used as a database for the exploration of articles on clinical research that assessed the drugs listed.

Results

Out of 106 drugs cited on Precrire's review, 80 were found to have an Anvisa register. Aliskiren, a blood pressure-lowering renin inhibitor, was selected to be the first drug listed to be assessed in Cemed's meetings.

Discussion

Through a presentation of a systematic review and meta-analysis on effects of aliskiren, students were able to participate in critical discussions and also deepen their understanding of how epidemiological principles and clinical research methodologies intersect within the scope of safety assessment and effectiveness of medicines. Such activities are extremely important for building the scientific reasoning of undergraduate students and encourage continuing education, which represents an essential tool for providing reliable technical-scientific information about health and reliable medicines.

Keywords

Education; Health Informatics; Scientific Information.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Essential Oils for Mental Health: Aromatikus

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About this experience report

DOI: 10.62922/4cbffc.cp147
Link: https://doi.org/10.62922/4cbffc.cp147
Type: Experience Report.
Area: Integrative and Complementary Practices.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Medicinal plants are highly valued for their therapeutic properties, used in both topical and systemic treatments (1). Among the various chemical substances found in these plants are essential oils, volatile compounds known for their powerful therapeutic effects (2). Essential oils exert therapeutic effects mainly through inhalation of their aroma, which interacts with the central nervous system (CNS), potentially influencing mood, emotions and mental health (3). Thus, the pharmacist is important in the application of essential oils in mental health.

Aim

This work aims to report the experience of a pharmacist in entrepreneurship with essential oils for mental health in a city in a northeastern state of Brazil.

Methods

A descriptive qualitative research through an experience report on pharmaceutical entrepreneurship with essential oils for mental health.

Results

The Aromatikus product brand was created for therapy focusing on mental health through aromasticks and roll-ons. Aromatikus products are made with essential oils of lavender, sweet orange, bitter orange, rosemary, lemongrass, peppermint, geranium, lavandin, eucalyptus globules. The target audience is college students for anxiety and focus and learning. as well as for migraines and self-esteem. Demand for essential oils is still low. There are people who do not know how to apply essential oils and do not believe in their effectiveness.

Discussion

There is resistance on the part of the population not to believe in the therapeutic results of aromatherapy (4). The aroma of essential oils are capable of promoting positive emotions such as joy, discouraging, encouraging, removing destructive thoughts, reducing stress, changing mood (5). Therefore, Aromatikus products can promote well-being and quality of life and reestablish mental health and the way of seeing the world.

Keywords

Medicinal Plants; Aromatherapy; Entrepreneurship; Pharmaceutical.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Living with Battles We Didn't Choose to Fight: the Role of the Pharmacist in the Care of Oncology Patients in a Hospice Unit

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About this experience report

DOI: 10.62922/4cbffc.cp148
Link: https://doi.org/10.62922/4cbffc.cp148
Type: Experience Report.
Area: Integrative and Complementary Practices.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Palliative care implemented in Brazil in 1990 exemplifies an approach to improving the quality of life for patients and families facing a life-threatening illness (1), such as malignant neoplasms, aiming to prevent and reduce suffering at the end of life. Without the goal of curing a disease, palliative care emphasizes that patients are alive and not defined by their illness, and can be cared for holistically. The promotion of a comfortable and peaceful environment for terminal care is represented by Hospice, defined as a philosophy that acknowledges and respectfully addresses global suffering, honoring the natural process of life. Symptom management is a fundamental goal of palliative care, provided by an interdisciplinary team of health professionals, with the pharmacist playing a role in pharmacological management, assessing needs and ensuring efficacy and safety for the patient (2).

Aim

Objectives: to recognize the technical, professional, and personal skills of the pharmacist in the care of oncology patients in palliative care within a Hospice unit.

Methods

Through the creation of a journal, the responsible pharmacist recorded daily personal impressions and developed technical and social activities experienced over a three-month period dedicated to patients in palliative care.

Results

Based on the pharmacist's journal, a checklist was created to assist in assessing signs and symptoms such as pain, dyspnea, constipation, nausea and vomiting, agitation, and delirium, which are closely related to the terminal phase of a life-threatening illness. This checklist allowed the pharmacist to be more precise in pharmacological interventions alongside the medical team, ensuring patient safety while aiming to alleviate discomfort and enhance quality of life through the combined efforts of the interdisciplinary team. Upholding the concept of palliative care, the patients' final wishes are respected by the team, including simple desires such as eating and/or drinking specific foods, boosting self-esteem by painting hair or nails, offering active listening and conversations about daily topics, and allowing the patient to see daylight and walk on a sunny day. These examples highlight the pharmacist's professional conduct beyond pharmacological measures, demonstrating that simplicity and attentiveness to reactions can be carried out by any member of the care team, emphasizing receptivity to physical, psychosocial, and spiritual symptoms.

Discussion

The philosophy applied to Hospice creates a daily learning environment for those involved and is divided into professional and personal growth. Professionally, the pharmacist stays updated daily on various pharmacological options and management for analgesics, opioids, antipsychotics, and off-label medications prescribed to the patient. Personally, the pharmacist is encouraged by performing actions with empathy, dedication, and care, as well as compassion for individuals facing battles they did not choose to fight in their final moments.

Keywords

Palliative Care; Pharmaceutical; Oncology.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Experience with Health Education on Integrative and Complementary Health Practices in a Hospital Context

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About this experience report

DOI: 10.62922/4cbffc.cp149
Link: https://doi.org/10.62922/4cbffc.cp149
Type: Experience Report.
Area: Integrative and Complementary Practices.
Received: 30/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Conventional allopathy is the first choice for treating human diseases in much of the world (1), however, it is important to emphasize that it is not the only possible treatment option. In addition to drug therapy, which acts in accordance with the biomedical model of health care, which is a model that focuses health care on the disease and not on the subject (2), Práticas Integrativas e Complementares em Saúde (PICS) act in the promotion, maintenance and prevention of health problems (3). According to the Política Nacional de Práticas Integrativas e Complementares (PNPIC), 29 practices are recognized as therapeutic measures to act together with the conventional care model (3). Some practices that act directly on the care of the body and mind, contributing to well-being and mental balance, stand out, such as: Yoga, Meditation, Chromotherapy, Flower Therapy and Music Therapy. The PNPIC emphasizes the implementation of these practices within the scope of continued, humanized and comprehensive health care (4). The initiative for this work was based on the observation that mental health treatment within the hospital setting focuses on pharmacological therapy, which is often the only modality of care offered to users of the service. In this context, working from the perspective of health education in public

healthcare services can be considered a good strategy, both to provide information about and to encourage PICS practices, strengthening other types of health care (5).

Aim

To present an experience report on the creation and use of a printed folder with information about PICS, how they contribute to the individual's quality of life and where the population can find these services within the health service network in João Pessoa - PB.

Methods

This is an experience report on the development of an educational/informative folder. The folder contains information on the 29 PICS offered by the Sistema Único de Saúde (SUS), as well as the benefits they can offer. It also lists the specialized services in the city of João Pessoa - PB and the means of accessing them. It was developed by members of the Residência Multiprofissional em Saúde Mental - RESMEN, belonging to the Núcleo de Estudos em Saúde Coletiva - NESC, linked to the Universidade Federal da Paraíba - UFPB. These residents make up the following professional centers: Nursing, Pharmacy, Nutrition, Physical Education Professional and Psychology. The folder was created in April 2024 and made available at the event “I Cuidado Para Além dos Muros”, held at the Hospital Universitário Lauro Wanderley located in the city of João Pessoa - PB in allusion to the month of the Anti-Manicomial Struggle, between May 7th and 23rd, 2024.

Results

The folder had a positive impact on the dissemination of information about PICS, as it was explained what they are, how they work and the locations where they are offered. It was noted that the subject generated curiosity and interest among patients and health service professionals who were unfamiliar with the practices. There were also positive reports from people who practiced some PICS. It is clear that these practices can be a powerful alternative in expanding mental health care and complementary to drug treatment. It can be considered an important tool to be used as an informative instrument working in line with Health Education. Furthermore, within the perspective of providing health information to patients and health service professionals, the folder on PICS can contribute to promoting the autonomy of the subject to awakening interest in self-care and enabling access to other care modalities.

Discussion

Considering the comprehensiveness of care, which sees the subject as a being composed of several layers (biological, mental, social, spiritual), a holistic and broad vision of health care, which goes beyond the logic of illness as a cause-disease, PICS are seen as an alternative for health care and, from this perspective, favors the focus of treatment not being solely on the use of medications (6), favoring a perspective of demedicalization of life (7). Thus, it can be stated that the educational/informative folder is a good tool for the didactic and illustrative approach to health education work, as well as health communication, quite powerful to provide meetings, dialogues and debates in the daily routine of health services.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Health Education; Complementary Therapies.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Extrapyramidal Reactions Caused By the Interaction Between Chlorpromazine and Bromopride in a Tetanus Patient: Experience Report

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About this experience report

DOI: 10.62922/4cbffc.cp150
Link: https://doi.org/10.62922/4cbffc.cp150
Type: Experience Report.
Area: Pharmacotherapy.
Received: 30/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Tetanus is a disease caused by the bacteria Clostridium tetani, which produces neurotoxins that trigger muscle spasms. Treatment includes the use of antibiotics, active and passive immunization, neuromuscular blockers and sedative medications, such as chlorpromazine (1). Chlorpromazine is known to cause extrapyramidal reactions, which are unwanted motor side effects. These reactions include acute dystonia, characterized by involuntary and painful muscle contractions; akathisia, parkinsonism, and tardive dyskinesia, which develops after prolonged use and is characterized by repetitive and involuntary movements. These adverse effects result from the blockade of dopamine receptors in the basal ganglia, a brain region that coordinates movement (2).

Aim

The aim of this experience report was to describe a successful case in the treatment of a patient with accidental tetanus who, however, developed adverse reactions due to the use of chlorpromazine and bromopride interaction.

Methods

Initially, clinical case data were collected from the electronic medical record of a University Hospital in Belém-PA, Brazil. After, a bibliographic survey was carried out to support the case, covering the treatments used, possible adverse reactions and drug interactions.

Results

Results of Experience report: the patient, E.A.G., a 31-year-old man, was admitted to the intensive care unit (ICU) at a University Hospital in Belém-PA due to a diagnosis of accidental tetanus caused by an injury to the left hallux that occurred 10 days ago . At the time of admission, he had contractures, severe pain, sweating and tachycardia. During his hospitalization, several treatments were adopted, including antibiotic therapy, tetanus immunoglobulin, tetanus vaccine, continuous sedation and neuromuscular blockade. After 10 days of hospitalization, the patient developed chlorpromazine poisoning, used as a sedative in severe cases of tetanus when the first-choice medication does not provide an adequate response. Chlorpromazine caused constipation, an anticholinergic effect of the medication, and there was an X-risk drug interaction with bromopride, potentiating extrapyramidal reactions. Neuroleptics and antiemetics generate a reduction in dopamine concentrations, which can cause motor changes and result in extrapyramidal symptoms, such as akathisia, dystonia and dyskinesia. In response to these adverse events, medications were discontinued and biperiden was administered to control extrapyramidal symptoms due to its anticholinergic action.

Discussion

The adverse effects result from the blockade of dopamine receptors in the basal ganglia, a brain region that coordinates movement. Management of these reactions may include reducing the dose of chlorpromazine, switching to another antipsychotic with a lower propensity to cause extrapyramidal symptoms, or using anticholinergic medications to alleviate the symptoms. Dopaminergic activity within the nigrostriatal pathway (at dopamine D1 receptors) and striatopallidal pathway (at dopamine D2 receptors) regulates output from the basal ganglia which controls movement. Metoclopramide inhibits central D2 receptors, which may cause an imbalance in dopaminergic activity between the nigrostriatal and striatopallidal pathways leading to movement-related side effects (3). In clinical considerations, if the combination of these medications is required, it's crucial to monitor for adverse effects closely, particularly extrapyramidal symptoms; the benefits of combining these drugs should be weighed against the risks. If extrapyramidal symptoms become significant, alternative treatments or additional medications to manage side effects may need to be considered. In addition, Patients should be informed about the signs and symptoms of extrapyramidal effects and advised on when to seek medical attention.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

This interaction is an example of how pharmacodynamics can affect the safety and efficacy of treatment. It is always recommended that combinations of medications be managed by experienced healthcare professionals to ensure that treatment remains safe and effective (4). In conclusion, the use of chlorpromazine in high doses and concomitant use with bromopride increases the risk of adverse reactions, making its use contraindicated. In view of this, it is important to highlight the role of the clinical pharmacist in pharmacotherapeutic monitoring and monitoring adverse reactions and drug interactions, to ensure patient safety.

Keywords

Tetanus; Chlorpromazine; Bromopride; Extrapyramidal Reactions.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Challenges of Pancreatic Enzyme Medication Adaptation Use By Pediatric Caregivers in a Children'S Hospital: an Experience Report

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About this experience report

DOI: 10.62922/4cbffc.cp151
Link: https://doi.org/10.62922/4cbffc.cp151
Type: Experience Report.
Area: Pharmacotherapy.
Received: 29/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Cystic fibrosis (CF) is an autosomal recessive genetic disorder caused by mutations in the CFTR gene, leading to the inhibition or malfunction of chloride channels in the membranes of the pulmonary surface or glandular epithelium, resulting in the production of thick and sticky mucus (1). In addition to pulmonary manifestations, CF patients may experience pancreatic insufficiency (PI), which leads to malabsorption of fats, proteins, and carbohydrates, causing malnutrition (1). For these patients, enzyme replacement therapy is necessary, involving the administration of capsules containing lipase, protease, and amylase (2). The lack of specific pharmaceutical formulations for pediatric use remains a persistent issue. Thia stems from the dynamic physiological changes experienced by this population, making it difficult to develop a single formulation that caters to the specific needs of each age group. Consequently, therapeutic interventions often rely on adapting existing formulations, as is the case with PI treatment. This issue is even more complicated in neonates and children under two years old, given the safety and efficacy concerns of such medication (3).

Aim

This objective focuses on providing a comprehensive account of the pharmacist's contributions to patient care within the outpatient setting specifically for individuals with cystic fibrosis.

Methods

This work consists of an experiential report on the professional practice of a resident pharmacist participating in a multidisciplinary residency program during the period from April to May 2024, in which activities were developed in the practice setting of the Outpatient Clinic of a pediatric hospital. The construction of this report stemmed from the interactions between the pharmacist, the resident, and patients during pharmaceutical consultations in the cystic fibrosis outpatient clinic. The pharmaceutical consultations were conducted individually with each patient and their respective caregivers, aiming not only to evaluate the therapy used but also to understand the patient, their allergy history, self-medication practices, and difficulties in adhering to the treatment, thereby enabling the use of strategies to address the identified issues. The main care aspects involved guidance on the use of medications, including enzyme therapy, nebulized bronchodilators and mucolytics, and antibiotics for infection control. For enzyme therapy, the need for guidance on the correct use of medications and issues such as storage methods following the adaptation of the pharmaceutical form was assessed.

Results

During the pharmaceutical consultations to guide the treatment of CF, several challenges were observed regarding the use of pancreatic enzymes in neonates and children under two years of age, who required doses smaller than those commercially available, as well as in patients who had difficulty swallowing the capsule form, the only one available. For these patients, it is necessary to adapt the pharmaceutical form, which is done by caregivers at home based on instructions received from doctors and pharmacists. Caregivers reported difficulties in dividing doses, even with guidance, given that it involves dividing the microspheres within the capsules. In some cases, the imprecision of dosing due to preparation difficulties can lead to treatment ineffectiveness or adverse reactions, such as constipation. as described in the product leaflet, another factor that can affect treatment efficacy is the chewing and crushing of microspheres, an event also reported during consultations (6). This chewing can cause irritation of the mucous membranes due to the premature release of enzymes in the oral cavity. Another reported issue concerns the storage of capsules after removal from the blister pack. Improper storage can lead to medication alterations and the need for disposal. Given these observations, a literature search was conducted to identify improvements for patient treatment. The search revealed a scarcity of studies focused on the adaptation of enzyme formulations, with only specific information on how to perform such adaptations as already described in the product leaflet.

Discussion

Thus, the issues identified during the provision of pharmaceutical guidance for these patients highlight the need for studies focused on the use of pancreatic enzymes, addressing potential treatment

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

weaknesses. Additionally, there is a pressing need for the development of pharmaceutical forms specifically designed for pediatric patients that cater to their unique needs, ensuring a more effective and safer treatment for this population.

Keywords

Pediatrics; Pancreatic Enzymes; Adaptation.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Sporotrichosis in the Context of One Health in a Reference Center in Southeast Brazil

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About this experience report

DOI: 10.62922/4cbffc.cp152
Link: https://doi.org/10.62922/4cbffc.cp152
Type: Experience Report.
Area: Public Health.
Received: 05/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Sporotrichosis is a neglected and emerging fungal infection caused by fungi of the species Sporothrix spp., with worldwide distribution. It is a subcutaneous infectious disease with a subacute to chronic course. The challenge of this mycosis in the context of One Health is due to its capacity for dissemination, potential severity and the lack of effectiveness of the pharmacotherapy used in its management. In the Brazilian context, this disease is the most frequent of the subcutaneous mycoses. Over time, the disease has become a public health issue due to the significant increase in cases in humans in recent years. Notification of sporotrichosis is not mandatory in the Brazilian context except for some cities and states: Rio de Janeiro, Pernambuco, Paraíba, Minas Gerais and the Federal District (1,2).

Aim

The objective of the study was to measure the cases and the profile of people diagnosed in the period from 2018 to 2023 in a reference center in southeastern Brazil.

Methods

Real-life study, nested in the Sporotrichosis Cohort in the period from 2018 to 2023 of cases reported in the Hospital Epidemiology Center and registered in the Information System: Hospital Management Information System (SIGH) of the Eduardo de Menezes Hospital (HEM) of the Hospital Foundation of the State of Minas Gerais (FHEMIG). The study was approved by the Ethics Committee of the Federal University of Minas Gerais and FHEMIG/HEM under CAAE: 00883118.0.3001.5124. Statistical analysis was performed using SSPS®21.0 software.

Results

The number of sporotrichosis cases diagnosed and reported was 105 during the study period. There was a predominance of 64% (67/105) of females. The age range varied between 8 and 82 years. The median age was 49 years. In the period from 2018 to 2020, the following cases were diagnosed, respectively: 10, 02 and 14. Between 2020 and 2021, due to the COVID-19 pandemic, we had a drastic reduction in diagnoses and notifications. All activities at the reference center were directed to treating COVID-19 cases exclusively. During this period, the following cases were diagnosed, respectively: 2 and 14. as of 2022, there were 20 cases in 2022 and 44 cases in 2023. Of these 105 cases, 29 (27.6%) developed systemic sporotrichosis and 9 (8.6%) died. The drugs used in the treatment were: itraconazole, fluconazole and liposomal amphoterin B.

Discussion

Sporotrichosis, an emerging subcutaneous mycosis, is having a growing impact at this reference center in Minas Gerais. It is mainly caused by the fungus Sporothrix brasiliensis. Over time, it has shown an expansion and with this study we identified an increase in the number of cases over time and in severity. Among neglected and emerging diseases, sporotrichosis requires an integrated One Health approach and development of Public Health policies, ensuring access to services, timely diagnosis, monitoring of cases and provision of drugs used in treatment.

Keywords

Sporotrichosis; One Health; Neglected; Emerging.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Contributions of the Pharmacist to the Smoking Cessation Group

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About this experience report

DOI: 10.62922/4cbffc.cp153
Link: https://doi.org/10.62922/4cbffc.cp153
Type: Experience Report.
Area: Public Health.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Over a million diseases and hundreds of thousands of deaths occur each year due to events associated with smoking, such as cardiovascular diseases, respiratory diseases, diabetes, and cancer (1). This situation affects the quality of life of the population and leads to high public costs for medical care and loss of productivity due to premature death and disability related to smoking(2). The National Tobacco Control Program operates through health promotion actions, prevention, and treatment of smoking and nicotine dependence(3). In this context, pharmaceutical care and pharmacotherapeutic monitoring have a positive impact on smoking cessation (4).

Aim

Describe the qualitative experience of a pharmacist in supporting a smoking cessation group managed by professionals at a Primary Health Care Unit, and the potential contributions of the pharmacist in this context.

Methods

This is an experience report from a pharmaceutical resident in primary health care in Rio Grande do Sul. The professionals who conducted the smoking cessation group adopted a group approach, with sessions organized according to the guidelines of the National Cancer Institute (5). The strategies used

included discussion circles, educational lectures, guidance, and demonstrations of anxiety control techniques.

Results

With dynamic and engaging sessions, thanks to the integration of the diverse knowledge and skills of the professionals, each meeting represented a stage of the guidelines in the coordinator's manual and the four booklets developed by National Cancer Institute. After the initial four meetings, follow-up was conducted on a biweekly and monthly basis. The main difficulties reported were reconciling the schedule with work and living with other smokers. The group consisted of 8 to 20 people, led by pharmaceutical resident in Primary Health Care, a nurse and doctor, all of whom were trained by National Cancer Institute. Nursing students also participated. Some smokers were participating in the group for the second time. Most participants remained consistent throughout the initial four meetings, maintaining controlled abstinence and staying motivated to continue with the relapse prevention sessions. The group interactions strengthened the effort to support each other in the motivation to quit smoking.

Discussion

Various experiences and difficulties encountered during the smoking cessation group are identified as opportunities for engagement by the multiprofessional team (6,7,8). Follow-up after the four sessions is essential to ensure continuity of care and prevent potential relapses. The presence of the pharmacist contributes to the quality of the therapeutic approach in comprehensive health care in primary health care, such as access to medications, guidance on the use of nicotine patches, pharmaceutical interactions, and contraindications (8,9).

Keywords

Smoking Cessation; Pharmacists.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Pharmacist's Contribution to the Smoking Cessation Group

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About this experience report

DOI: 10.62922/4cbffc.cp154
Link: https://doi.org/10.62922/4cbffc.cp154
Type: Experience Report.
Area: Public Health.
Received: 04/08/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

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Aim

Describe the qualitative experience of a pharmacist in supporting a smoking cessation group managed by professionals at a Primary Health Care Unit, and the potential contributions of the pharmacist in this context.Describe the experience of a pharmacist in supporting a smoking cessation group managed by professionals at a Primary Health Care Unit, and the potential contributions of the pharmacist in this context.

Methods

This is an experience report from a pharmaceutical resident in primary health care in Rio Grande do Sul. The professionals who conducted the smoking cessation group adopted a group approach, with

sessions organized according to the guidelines of the National Cancer Institute (5). The strategies used included discussion circles, educational lectures, guidance, and demonstrations of anxiety control techniques.

Results

With dynamic and engaging sessions, thanks to the integration of the diverse knowledge and skills of the professionals, each meeting represented a stage of the guidelines in the coordinator's manual and the four booklets developed by National Cancer Institute. After the initial four meetings, follow-up was conducted on a biweekly and monthly basis. The main difficulties reported were reconciling the schedule with work and living with other smokers. The group consisted of 8 to 20 people, led by pharmaceutical resident in Primary Health Care, a nurse and doctor, all of whom were trained by National Cancer Institute. Nursing students also participated.

Discussion

Various experiences and difficulties encountered during the smoking cessation group are identified as opportunities for engagement by the multiprofessional multiprofessional team (6,7). Follow-up after the four sessions is essential to ensure continuity of care and prevent potential relapses. Pharmacological and non-pharmacological measures are important, and the evaluation for determining the treatment should be individualized.. Medications aid in smoking cessation by helping to reduce withdrawal symptoms and cravings. In the broader context, non-pharmacological measures are crucial for the medium and long term (8). The presence of the pharmacist contributes to the quality of the therapeutic approach in comprehensive health care in primary health care, such as access to medications, guidance on the use of nicotine patches, pharmaceutical interactions, and contraindications (8). Trained pharmacists can prescribe nicotine replacement supplies according to the municipality's protocol.

Keywords

Smoking Cessation; Pharmacists.

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DOI: 10.62922/4cbffc
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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Health Education and Self-Medication: Lessons From the Culture Circle in a Family Health Unit in Manaus

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About this experience report

DOI: 10.62922/4cbffc.cp155
Link: https://doi.org/10.62922/4cbffc.cp155
Type: Experience Report.
Area: Public Health.
Received: 31/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Self-medication is a widespread practice in Brazil, particularly during the COVID-19 pandemic, when restricted access to healthcare services and the dissemination of often misleading information drove the use of medications without medical guidance (1, 2). While self-medication can provide quick relief for minor health issues, it is also associated with significant risks, such as adverse effects, dangerous drug interactions, and the development of drug resistance (3, 4). Studies indicate that a considerable portion of the Brazilian population resorts to self-medication as a primary care option, often influenced by socioeconomic, cultural factors, and the ease of access to over-the-counter medications (5, 6). The situation is exacerbated by a lack of comprehensive health education and the absence of effective campaigns promoting the rational use of medications. This scenario highlights the urgent need for interventions that critically and constructively address self-medication, fostering dialogue between healthcare professionals and the community (7). In this context, the project "Reflections on Self-Medication: an Approach through the Culture Circle" was implemented at the Japiim Family Health Unit in Manaus, aiming to create a collaborative learning space. Using the Culture Circle methodology,

inspired by Paulo Freire's pedagogical theories, the project sought not only to inform but also to empower participants to critically reflect on their health practices and the role of self-medication in their lives (8). By adopting a dialogical and participatory approach, the project provided participants with the opportunity to share experiences, discuss the risks associated with self-medication, and explore safer alternatives. This initiative aimed not only at individual awareness but also at building a collective consciousness that could influence changes in community health practices.

Aim

The objective of this experience report is to describe how the participatory methodology of the Culture Circle facilitated critical dialogue among project participants regarding the risks of self-medication. Additionally, it aims to highlight the lessons learned and the observed changes in participants' attitudes toward the rational use of medications.

Methods

The project was conducted at the Japiim Family Health Unit in Manaus, using a qualitative approach based on Paulo Freire's Culture Circle method. This methodology was chosen to promote an environment of dialogue and critical reflection on self-medication. Participants were selected during the reception process at the unit, focusing on adults aged 25 to 55, an age group identified as more prone to self-medication. The Culture Circle session was structured as a two-hour meeting, divided into interactive stages. Initially, participants were invited to anonymously answer the question, "What do you understand by self-medication?" the responses were collected and used to initiate discussions in small groups, where educational texts and materials about the risks and implications of self-medication were distributed. Next, the groups were encouraged to create visual representations or enactments reflecting their acquired knowledge. Practical activities, such as analyzing medication boxes with questions about common health situations, were also used to stimulate critical application of the knowledge gained. Facilitators, including pharmacists, dentists, and a psychologist, guided the discussions and provided complementary information. At the end of the meeting, a feedback session was held where participants shared their perceptions and how they intended to apply what they had learned in their daily lives. This experience report is registered under Anuência No. 105/2024 – ESAP/SEMSA from the Municipal Health Department of Manaus.

Results

The implementation of the participatory methodology of the Culture Circle proved effective in facilitating critical dialogue among participants about the risks of self-medication. During the activities, participants initially showed limited knowledge about the dangers associated with self-medication. However, through facilitated discussions and practical activities, there was a clear increase in understanding of the risks involved, such as adverse effects, drug interactions, and the potential to mask symptoms of serious illnesses. The participatory approach allowed participants to express their personal experiences with self-medication, which not only enriched the dialogue but also created a collaborative learning environment. The discussions fostered deep reflection on health practices and encouraged participants

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

to question the indiscriminate use of medications without medical prescriptions. One of the lessons learned was the importance of involving the community in educational processes that value their experiences and knowledge. Participants reported significant transformations in their perceptions, showing greater willingness to seek medical advice before using medications and an increased awareness of the importance of the rational use of medications. Additionally, many participants expressed a desire to share the knowledge they had gained with family and friends, indicating that the project's impact could extend beyond the directly involved group. The experience also highlighted the need to continue promoting spaces for dialogue and health education, using methodologies that encourage active participation and critical reflection. In summary, the use of the Culture Circle as a methodology facilitated the creation of a significant learning space and behavior change regarding self-medication, promoting a more conscious and safe health culture.

Discussion

The "Reflections on Self-Medication: an Approach through the Culture Circle" project demonstrated the effectiveness of participatory educational approaches in promoting the rational use of medications. By fostering a collaborative and reflective environment, participants were empowered to recognize the risks associated with self-medication and the importance of safe and informed health practices. The Culture Circle methodology proved particularly effective in facilitating collective knowledge construction and encouraging critical reflection on health practices. The observed behavioral changes among participants, such as a greater commitment to consulting healthcare professionals and a willingness to share the acquired knowledge, underscore the transformative potential of this intervention. Furthermore, the project highlighted the need for continued investment in health education initiatives that employ inclusive and dialogical approaches, especially in communities where access to information and healthcare services may be limited. The results underscore the importance of educational strategies in combating self-medication, not merely by providing information but also by empowering individuals to make informed decisions about their health. The experience gained from this project can serve as a model for other initiatives in similar contexts, contributing to the promotion of a safer and more responsible health culture. In conclusion, the project not only achieved its immediate objectives of raising awareness about the risks of self-medication but also planted the seeds for lasting changes in the health practices of participants and the wider community. The continuation of such initiatives is crucial for strengthening public health and promoting collective well-being

Keywords

Health Education; Self-Medication; Culture Circle.

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ISBN: 978-65-983944-2-4

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Health Education as a Strategy for the Rational Use and Correct Disposal of Medicines in the City of Recife - PE: an Experience Report

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About this experience report

DOI: 10.62922/4cbffc.cp156
Link: https://doi.org/10.62922/4cbffc.cp156
Type: Experience Report.
Area: Public Health.
Received: 28/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Brazil is the 10th largest consumer of medications in the world (1); however, high rates of self-medication and consequent adverse reactions indicate the need to qualify this access, whether in consumption or in the disposal of expired or unused products (2).The promotion of rational use of medicines was already included in the guidelines of the National Medicines Policy(3).Irrational use and incorrect disposal lead to soil and water contamination, which has an impact on the health of men and animals(2). Since 2020,

the Federal Government has regulated the reverse logistics process by establishing that drugstores and compounding pharmacies must act as collection points for the disposal of medications (4). However, due to the costly nature of the process involved in managing these wastes, information remains hidden from the public, which continues to dispose of them inadequately through regular trash and sewage systems. In this context, the "One Health" approach emerges, which considers that health should be addressed from a holistic perspective since humans, animals, and ecosystems share the same resources, spaces, and biogeochemical cycles, so their health is intrinsically related. In a globalized world with demands that exhaust natural remediation capacities, it is necessary for quality information to reach users clearly and accurately, to facilitate access to health technologies ensuring safety and therapeutic efficacy while considering environmental outcomes (5).

Aim

Describe the approach adopted to raise public awareness about the rational use and correct disposal of medicines.

Methods

This is an experience report of actions carried out, initially through the municipality's Pharmaceutical Services and Policies initiative, developed in the following stages. 1. Development of a health education project with the support of the municipal health department, the Pharmaceutical Services and Policies management, the school health program coordinations, and the city academy, highlighting also the involvement of pharmacists and Primary Care managers; 2. Establishment of intersectoral partnerships for the supply of collection boxes by the municipality's Urban Maintenance and Cleaning Authority (Emlurb) and expansion of the contract with the company specializing in waste management, including incineration of medicines; 3. Presentation of the project to the involved parties to define the locations where information would be disseminated and where the collectors for expired or unused medications would be placed; 4.Definition of the target audience, covering municipal public school students in the 8th and 9th years, and those attending the city's academy centers in the 08 health districts (DS); 5. Conducting discussion sessions on the circles of conversation and 6. Promotion of actions on social media.

Results

From March to June 2024, lectures were held at the following schools: Escola Estadual Cícero de Assis (DS II), Escola Municipal Vila Sésamo (DS VIII), and Escola Municipal Mario Melo (DS II), reaching approximately 300 students. Out of the 43 city academy centers, actions were conducted at the centers: Boa Viagem (DS VI), Miguel De Cervantes (DS I), and Vila Um Por Todos (DS VII), in two shifts, reaching about 100 users who actively participated in the discussion sessions on rational use and correct disposal of medications. During the presentation, a QR code was provided with guidelines on rational use and proper disposal of medications, in addition to information on public and community (private) pharmacies and gym centers in the city with collectors for reverse logistics.In public units, 80 collectors

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

of expired or disused medicines were distributed, being distributed in the 43 Centers of the City Academy and in pharmacies of 37 Family Health Units, to facilitate the disposal of medicines by the population.

Discussion

Studies indicate that the inappropriate use of medication, especially in cases of self-medication, is among the factors responsible for generating health demands, a higher incidence of adverse effects due to inadequate dosage, loss due to expiration, among others (2,6). This scenario becomes worse when referring to the already problematic context of development of bacterial resistance and consequent loss of effectiveness of antimicrobials, as it contributes to the obsolescence of pathways capable of mitigating these infections, especially in patients undergoing long periods of hospitalization (5, 7). This demonstrates the need to develop public actions aimed at encouraging the rationalization of medicines and reverse logistics. The health education involving people of different ages and social classes, enhances the dissemination of quality information, inducing social transformation, as there is strong evidence that these changes are more effective with the involvement of everyone. A success story to be taken into consideration is described in a study carried out in Australia, which demonstrated significant improvements in the use of medicines by the population, which began to do so safely, after the implementation of an educational project involving consumers (8). Another intervention program in the United States associated the promotion of safety with the proper disposal of medicines, also having positive results, with significant behavioral changes among participants, being a relevant achievement, especially within a society like the United States, where there is a strong culture of self-medication driven by the advertising freedom given to pharmaceutical companies, which with great appeal, are capable of generating pressure from patients on professionals for prescriptions (6). This reinforces the effectiveness of educational interventions in changing medication consumption and disposal habits. Therefore, it is crucial that educational initiatives continue to be implemented and improved, to ensure the improvement of the social, public health and environmental scenario (9,10,11). Initiatives such as the “Global Monitoring of Pharmaceuticals”, carried out by the University of York, have sought to monitor the environmental impacts of disposing of medicines in inappropriate locations (12). Some groups of medicines, such as antimicrobials, contraceptives and psychotropic drugs, for example, already demonstrate an impact on fauna, when exposed to some of these medicines, which are being detected in water sources located in large urban centers, such as fluoxetine (Inhibitor selective serotonin reuptake), which caused reproductive and behavioral changes in fish (13). The role of health education in promoting environmental awareness about the risks related to the irrational use and incorrect disposal of medicines is reiterated, as well as the relevance of the involvement of primary, secondary and higher education institutions, the support of public managers and Health professionals support actions capable of promoting access, use and conscious disposal of medicines. The expectation is that this experience report, the result of an intersectoral project designed by a group of pharmacists from the municipal health network, which began in 2024, will have its actions expanded and form multiplier agents in favor of a broad and permanent environmental awareness movement, bringing positive impact to the environment and public health.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Drug Utilization; Health Education; Pharmacy; Reverse Logistics.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Implementation of a Digital Process in the Vaccine Application Stage: the Benefits for the Municipality

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About this experience report

DOI: 10.62922/4cbffc.cp157
Link: https://doi.org/10.62922/4cbffc.cp157
Type: Experience Report.
Area: Public Health.
Received: 28/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

This file was created to present a problem identified in a pharmaceutical service network where the request for vaccines requests sent to the site are filled out by manual form. With this, the unit receives a voluminous paperwork, which generates costs for the city, a digital procedure with an integrated system in the municipal server itself would make the process faster and more practical (1). It is worth mentioning that digital services tend to cost less after their incorporation into the institution's database, resulting in different applications of public money. as an example that generates large expenses for the municipality is the excessive spending on paper, pens and printer inks (2), which will be used to print the files later sent to the body; being this cost eliminated with digital files that can be stored in a database (3). Therefore, the use of an electronic form that allows health units and their respective regions to carry out immunobiological requests could streamline and improve the relationship between the city and the citizens, generating a mutual benefit. In addition, the digitalization of processes represents even an

increase in productivity, because there is a rapid demand, employees can optimize service time and perform tasks more efficiently (4). Thus, the best proposal would be the implementation of a program that can be accessed by all regions to make the request for vaccines, making the procedure less bureaucratic and more agile (5).

Aim

Improve the process of requesting vaccines, from the implementation of a more digital procedure.

Methods

Develop a software program that can be integrated into the city's system for the request of vaccines and analysis of its usefulness to the public body. From the creation of the software program; the first step of the methodology will be made the incorporation to the official site of the city hall, where they are accessed for operations already performed in the unit, then an online lesson will be provided to teach employees how to use the program created to order vaccines. However, if the suggestion of the online form is more feasible, the link created would direct access to an electronic questionnaire similar to the physical document, can be filled in the same way that is already done traditionally and later saved in a database, as Google Drive created specifically for this application of immunobiological requests, where the information would be stored for subsequent evaluation by responsible employees. Thus, at the end of the process will be the implementation of a new functionality on the city's website that is free access to its servers, can be accessed simultaneously by professionals avoiding the expense of papers that are sent daily to the site.

Results

From the implementation of the proposal, it is expected that there will be an agility in the procedure for requesting vaccines to the Coordination of Pharmaceutical Services of the city of fortaleza, avoiding the cost with papers, which can be coated for other needs of the population, besides making the work easier and practical for everyone.

Discussion

The process of digitization is quite common and it is more frequent as technology advances, the demand for such service is frequent in the country, as in the city of Santos, that after implementing digital processes to everyday life received the World Award for Excellence in Business Process and Workflow Management in 2015 (6) which demonstrates in a practical way the importance of digitization in public bodies, and what leads to the need to implement such a project in the network of pharmaceutical services of the city of fortaleza. By the foregoing, wait-and-andthe proposal is applied later and can achieve the objective of improving the procedure for supplying vaccines through the Pharmaceutical Services and Policies network to health units, process and integrating a more digitized system.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Keywords

Digitalization; Agility; Vaccines; Request.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

The Lack of Adequate Guidance for Accessing Supplies Denied Administratively in the Unified Health System

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About this experience report

DOI: 10.62922/4cbffc.cp158
Link: https://doi.org/10.62922/4cbffc.cp158
Type: Experience Report.
Area: Public Health.
Received: 28/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Pharmaceutical Services and Policies encompasses initiatives aimed at promoting, protecting, and restoring health, focusing on both individuals and the collective, ensuring access to and proper use of medications and supplies for the population's health(1). The internship at a Pharmaceutical Services and Policies agency highlighted its crucial role in managing medicines, vaccines, immunobiologicals, and other supplies at the municipal level, contributing to the development of Municipal List of Essential Medicines. The agency is responsible for acquiring and distributing supplies, monitoring municipal Cold Chains to ensure the quality and preventing wastage. It also advises the Municipal Health Department and other municipal administration bodies on equipment, suppliers, and supplies, and promotes the training of pharmacists and pharmacy technicians, among other functions(2). A significant issue identified was the complexity of the agency's administrative processes, especially regarding supplies not covered, such as diets, disposable diapers and hospital beds, which must receive a negative opinion

according to protocol and are only available through legal action. This exhausting step becomes necessary when patients cannot obtain medications, supplies, or surgical procedures through the regular channels of the Unified Health System. Excessive bureaucracy can delay service provision, negatively impacting the ability to deliver timely pharmaceutical services and causing user dissatisfaction. Most patients, already vulnerable due to their illnesses, are not informed from the outset about the possibility and stages of the legal process, making the start of the legal process slow and its conclusion time-consuming. The lack of adequate guidance can worsen patients' health conditions and generate additional costs for individuals, necessitating measures to improve the service, especially regarding communication and guidance on patients' rights, ensuring mechanisms for access to these supplies(3).

Aim

Train health professionals to guide the population on how to proceed with the judicialization of the right to health.

Methods

Each step of the process evaluation was observed with the accompaniment of a pharmacist from the administrative sector to better understand the workflow and recognize the difficulties related to this process. Through the observation and analysis of the issue in question, it is necessary to create categorical measures to correct it. For example, by training health professionals in each region, conducting face-to-face training with specialists in health law and public administration, as well as organizing simulation sessions of services to practice welcoming patients to provide direct guidance to the population, alerting them to the possibility of initiating a judicial process to receive the benefit, making the process of acquiring these supplies more efficient, satisfactory, and humane. Additionally, the Municipal Health Department can develop informative materials, such as pamphlets and posters, that explain to patients which supplies are not offered by the SUS, the importance of seeking legal advice from the beginning, and what documents are necessary to start the process, making them available at health posts, care centers, and on the official website.

Results

Thus, it is possible to reach a level of simplification of the steps that minimizes both the waiting time and the complexity of the process, significantly speeding up the service. This optimization not only reduces user dissatisfaction and complaints about the service but also diminishes the negative social impacts that the current procedure generates for those in greatest need. By making the process more efficient, vulnerable patients, such as bedridden elderly or children and low-income individuals, will have faster and more direct access to essential supplies, improving their quality of life and reducing the suffering caused by bureaucracy. With this, a general improvement in the perception of health services is expected, increasing user confidence and satisfaction, and promoting a fairer and more equitable system.

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Discussion

Therefore, the lack of adequate guidance for accessing supplies denied administratively affects the access of vulnerable populations to the procedures they need. However, through the implementation of appropriate measures, as described above, it is possible to reduce the negative impacts on the provision of this service, increasing the satisfaction of beneficiaries who will feel better assisted and have their needs met, thereby strengthening the position of not only this location as a reliable and efficient agency but also the Health System as a whole.

Keywords

Pharmaceutical Services and Policies; Health's Judicialization.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Semaglutide (Ozempic): How off-Label Use Influences the Drug's Perspective

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About this experience report

DOI: 10.62922/4cbffc.cp159
Link: https://doi.org/10.62922/4cbffc.cp159
Type: Experience Report.
Area: Public Health.
Received: 05/07/2024; Accepted: 31/08/2024; Published: 03/10/2024.

Introduction

Ozempic is a drug developed by the pharmaceutical company Novo Nordisk, which has become very popular nowadays(1). The medicine in question has in its composition Semaglutide, configuring itself as a hormone receptor agonist Glucagon-Like Peptide-1 (GLP-1), which is an enzyme normally produced by intestinal epithelial cells, predominantly in the small intestine, called L cells (2)(3). Therefore, this enzyme is classified as an incretin, a classification of substances hormones released from food intake, especially when rich in lipids and carbohydrates(3). Endogenous GLP-1 is capable of stimulating insulin secretion by pancreas, increase gastric emptying and act on plasma lipids, contributing to the reduction of systolic blood pressure, thus presenting a cardioprotective(4). On the other hand, this incretin has a short half-life, which is approximately 1 to 2 minutes in the blood, due to the rapid action of the enzyme Dipeptidyl Peptidase-4 (DPP-4), the which removes two amino acids from the amino terminus, resulting in 2 inactive fragments of the GLP-1, which are quickly eliminated by the kidney(5)(6). Due to these characteristics, the Ozempic was created mimicking these endogenous functions, however, they are more resistant to the action of DPP-4 (6). It is known that Ozempic was developed to treat type II Diabetes Mellitus by him prove to be a GLP-1 agonist, which stimulates the release of more insulin by the

pancreas and inhibits glucagon, in addition to presenting a low risk of causing hypoglycemia (7). However, this medicine is not only being used to treat diabetes, but also to treat obesity through weight loss in an off-label way (pharmacological use different from the specificity of the leaflet)(8) (9). Therefore, this research proposes an analysis of the off-label use of the drug Ozempic and how it impacts on popularization today, through the perspective of a small group of students and health professionals from a city in the interior of São Paul.

Aim

This study is to investigate the off-label use of the drug Ozempic (Semaglutide), in focus on the perspective of users and non-users of the drug. Furthermore, this research seeks to understand how the pattern of use and advertising influence adherence and use of the medicine in contemporary times, using data analysis from a small group of individuals from a city in the interior of São Paulo.

Methods

This research is a descriptive quantitative analysis field research with a cross-sectional study carried out with students and health professionals in a city in the interior of São Paulo. Data were collected through the questionnaire digital form (forms) aimed at providing individuals with knowledge about the medicine Ozempic. This form was made available in communication vehicles from December 2023 until March 2024. In the study methodology, the questionnaire was developed with questions that address questions such as gender, age, knowledge about the drug and advertising impact of the medicine. Therefore, it is necessary to highlight that the group of participants was divided into age groups of 16 to 20 years, 20 to 30 years, 30 to 40 years, 50 to 60 years and over 60 years old. Furthermore, participants' knowledge was categorized as "excellent" for those who demonstrate in-depth understanding of the medication and "no knowledge" for those who do not have knowledge about function, dose, indicatio and contraindication. Another important aspect was considered in one of the questions, in the which option "internet" referred to search engines like Google, which direct to website and blogs, while the social media alternative includes platforms such as Instagram and Facebook. In addition to field research, bibliographical research was carried out, through international and national scientific articles available in important databases such as Scielo (Scientific Electronic Library Online) and PubMed. Furthermore, this article was approved by the Research Ethics Committee (CEP), on the Brazil platform, in accordance with opinion nº 70793823.1.0000.5374, since data from individuals is being used, through the questionnaire available in communication vehicles. In this context, descriptors such as: semaglutide, diabetes mellitus, obesity, offlabel, GLP-1 were considered, both in Portuguese and English.

Results

Through the methodology adopted in the research and the database collected in relation to the knowledge and use of Ozempic among students and professionals at Faculdade São Leopoldo Mandic, among the 118 participants, 91 correspond to students and 27 correspond toemployees of the institution, and it can also be highlighted that among the same 118 volunteers, There are 38 men and 80 women. Regarding the age of the participants, it is noted that the majority (44 people) reports being 20 to

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

30 years old, while the minority of 4 individuals is over 60 years old.
According to the participating individuals, 112 of the 118 reported being aware of what the drug Ozempic is being treated, while 6 has no knowledge about it. A Based on the research carried out, we highlight that the number of individuals who report regular and good knowledge tie for the majority (both with 28.8% of the votes), followed by the number of volunteers with poor knowledge about the drug in question (13.6%). It is also observed that 12.7% and 11.6% of participants had a knowledge reported as very good and excellent, respectively. Only a minority 4.2% reported having no knowledge of the subject.Therefore, it is clear that the doctor's level of knowledge is more predominant in good and regular level, even for those who are studying or teaching in a health unit. This average content of the medicine is even more evident with the fact that 107 of those interviewed believe that the main function of the medicine is the loss of weight and that 91 believe in the effective control of type II diabetes. The majority of the study population believe that, at this time of information, the publication of this medicine influences the perception of the medicine, with 73.7%
believe so, 12.7% are not sure about the subject and 13.6% do not think that the advertising encourages the purchase and sale of the medicine and its adherence by the community.

Discussion

In modern society, exponential cases of obesity have attracted the attention of many health professionals, since excess adiposity in the body constitutes a global public health problem(10). In this sense, it is known that This pathology is complex and multifactorial, showing itself as a precursor or as a factor aggravating other diseases. Treatment consists of lifestyle changes, where we can highlight: regular diet, physical exercise, carrying out more complex procedures such as reduction surgeries, in addition to the use of drugs that may have great potential to help with the weight loss process(10) (11). On the other hand, many individuals do not opt for healthier practices and changes in their lifestyle, but they adopt other methods, said to be “easier” and with better results,faster, such as medication abuse and reduction surgeries, following thus the search for the body idealized by society, which highlights low weight and weight loss. This idealized model shows a strong correlation with the “lipophobic” era. Of today's society, the term being used to refer to those who have an aversion to gain of weight(11). However, the search for bodily perfection can cause healthy losses and/or worsening of diseases, especially where there is a sudden reduction in weight for the body(11). According to this perspective and mentality of current society and correlating it with the excessive purchase and sale of the medicine with the commercial name Ozempic, originating from Semaglutide, mainly due to its off-label function, which is the reduction of body, obese and non-obese (12). However, the use of the drug is not completely safe, as it can cause side effects, the most common gastrointestinal disorders being: nausea, diarrhea, vomiting, constipation and dyspepsia. In addition to being able to generate hypoglycemia when combined with insulin. Furthermore, not all individuals can use the drug, as it is contraindicated for individuals with a family history of thyroid neoplasia, endocrine, acute or chronic pancreatitis, pregnant women and type I diabetes(13). Therefore, due to the current lifestyle with excessive food consumption ultra-processed foods and a growing sedentary lifestyle, there is a growing search for loss of Weight. However, instead of changing paradigms and well-being, they are looking for ways faster and easier, for example to medicines that favor the reduction of body treatments, such as Ozempic. This pattern of

DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

consumption and view of the medicine is impacting the mentality of the community, causing a distorted view of the drug and not a real and this is corroborated by social media that are increasingly growing the appeal and purchasing the medication in order to maintain the social standard of weight loss.

Keywords

Weight Loss; off-Label; GLP-1; Obesity.

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DOI: 10.62922/4cbffc
ISBN: 978-65-983944-2-4

Brazil in Advancing Pharmacotherapy and Clinical Pharmacy in Latin America

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ISBN: 978-65-983944-2-4
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9 786598 394424

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