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Rua Dr. Manoel de Almeida Belo, 1333 - Bairro Novo - Olinda - PE CEP 53030-030
Telefone (81) 3011-5454

e-mail
anaisfmo@fmo.edu.br

Office hours

Graphic Design
jorgegregorio@fmo.edu.br

Production
Faculdade de Medicina de Olinda

Editing
Tito França - wtito.mobile@gmail.com

SUMMARY

Letter to the editor

Carta ao editor

Dr. Inácio de Barros Melo Neto

General director at the Faculdade de Medicina de Olinda

Dear Editor,

In another edition of the journal Anais da Faculdade de Medicina de Olinda, it is clearly observed that this institution is committed to the founding pillars of higher education: teaching, research, and extension. In this new edition, we must highlight the achievements in these areas, with the consolidation of actions in each of the elements of this tripod.

The result of excellent teaching was integrated into a curricular matrix and an innovative teaching methodology, complemented by extension actions and projects in various areas and perspectives, which foster the necessary community engagement among our students. Additionally, this approach encourages reflection and application of curricular themes beyond the classroom limits.

In this Edition, we celebrate several achievements, including the holding of the 2nd FMO Health Congress, which focused on discussions of chronic non-communicable diseases. The Congress brought together experts from the most diverse areas of medicine and included an opening conference, debate tables, the Simulation Olympiad, and the presentation of more than 100 works with free themes, divided into oral and posters, being considered a milestone for updating knowledge in the medical field, not only for our students but for the entire community.

We concluded 2019 with the successful completion of all components developed at the Institution by the first FMO class. We designed an internship that covered the largest and most complex hospital centers in the state of Pernambuco, in addition to six basic health units in different municipalities, providing a broad view of the SUS care network. All these efforts consolidate the Faculdade de Medicina de Olinda as a major center for medical training. These advances are reflected in this journal as we observe the quality of the studies published and the expansion of thematic horizons, such as the exclusive section dedicated to Social Responsibility.

+Author correspondence: revistaanaisfmo@fmo.edu.br

Letter from the editor

Carta do editor

Prof. Paulo Sávio Angeiras de Goes

Editor-in-Chief, PhD

Dear,

We are pleased to present another edition of the journal Anais da Faculdade de Medicina de Olinda. In this edition, the journal highlights the quality of the institutional actions developed over the past semester. From this edition onwards, the Open and Free Access Journals System (OJX) was implemented, enhancing the automation of the entire editorial process. Thus, the journal began to be registered as an online journal, facilitating access for authors, evaluators, and editors seeking to publish the results of their research, and qualifying the Anais for the first stage of its international indexing, which had already been requested from the Latin Index.

This innovative and dynamic process resulted in a greater number of articles being submitted, with a special call extended until January 25, 2020, which allowed the editors to make a more careful and broad selection of publications for each edition, marking a significant achievement for this journal.

Innovatively, the Anais opened two new sections, one especially dedicated to Social Responsibility, a hallmark of our institution, premiered with an essay signed by Profa Simone Tetu Moyséis, PhD, Pontifical Catholic University of Paraná, entitled "Sustainable Development Goals and health promotion: an essential alliance against chronic diseases", and the other reserved for reporting the experience of interventions in communities conducted by our students when they participate in the Integration of Health Actions and Community.

Last, the journal Anais da Faculdade de Medicina de Olinda features a section dedicated to the review of books related to Medicine, including its philosophical, historical, theoretical, and clinical aspects, with the debut review of the book "The Laws of Medicine" by author Siddhartha Mukherjee.

With these changes, the journal Anais da Faculdade de Medicina de Olinda presents solid content and reaffirms the institution's commitment to contributing to the advancement of knowledge. We wish you all a good reading!

+Author correspondence: paulosaviogoes@gmail.com

BURDEN AND QUALITY OF LIFE OF CAREGIVERS OF INDIVIDUALS WITH CHRONIC STROKE

SOBRECARGA E QUALIDADE DE VIDA DE CUIDADORES DE INDIVÍDUOS COM ACIDENTE VASCULAR CEREBRAL CRÔNICO

Taiana Marcondes Mendes[1/+], Marcela Raquel de Oliveira Lima[2], Arine Maria Víveros de Castro Lyra[3]

[1] IMIP/ Physiotherapist, [2] IMIP/ Coordinator physiotherapist of the Centro Especializado em Reabilitação IV– CER IV do IMIP, [3] UPE / Assistant Professor of the Universidade de Pernambuco

ABSTRACT

Objective: To analyze the burden and quality of life (QoL) perceived by caregivers, the correlation with the degree of disability in individuals with chronic stroke, and their impairment in activities of daily living. **Methods:** A cross-sectional analytical study was conducted at the Specialized Rehabilitation Center (CER IV-IMIP, Recife, Pernambuco, Brazil). Informal primary caregivers were evaluated for burden and QoL after the assessment of the functional capacity or disability of their respective individual with chronic stroke. Individuals were considered chronic at least six months after the stroke. The International Classification of Functioning (ICF), the Informal Caregiver Burden Assessment Questionnaire (QASCI), and the World Health Organization QoL-BREF (WHOQOL-BREF) were used to evaluate QoL. Statistical analyses were performed using the Shapiro-Wilk test with a significance level of $p < 0.05$ (SPSS). **Results:** Thirty-eight informal primary caregivers were assessed, and most reported a high burden (mean score, 102.92). Regarding QoL, individuals were rated between "needs improvement" and "fair." A significant positive correlation was observed between caregiver burden and the "body functions" domain. **Conclusion:** Caregivers of individuals with chronic stroke and disabilities reported a substantial workload burden and a negative impact on their QoL.

Keywords: Caregivers; Stroke; Quality of life.

RESUMO

Objetivo: Analisar a sobrecarga e qualidade de vida percebida por cuidadores, correlacionando-as com o grau de deficiência dos indivíduos com acidente vascular cerebral crônico e seu comprometimento nas atividades de vida diária. **Métodos:** Um estudo transversal e analítico foi desenvolvido no Centro Especializado em Reabilitação CER IV-IMIP (Recife – PE). Foram avaliados trinta e oito cuidadores primários informais, quanto à sobrecarga e qualidade de vida após a avaliação de seus respectivos pacientes, quanto a sua capacidade ou incapacidade funcional. Foram considerados crônicospacientes pós acidente vascular cerebral (AVC) crônico, com mais de 6 meses de lesão. Foram utilizados a Classificação Internacional da Funcionalidade (CIF), Avaliação da Sobrecarga do Cuidador Informal (QASCI), e a Avaliação da Qualidade de Vida (WHOQOL-BREF). As análises estatísticas foram feitas com o teste Shapiro-Wilk com $p<0,05$ (SPSS). **Resultados**: Foram avaliados 38 cuidadores primários informais, os quais, em sua maioria, relataram "sobrecarga intensa" (média de 102,92). Em relação à qualidade de vida, a maioria encontra-se entre "necessita melhorar" e "regular". Houve correlação positiva significativa, expressando relação direta entre a sobrecarga do cuidador e o item "função do corpo". **Conclusão:** Cuidadores de indíviduos com AVC crônico que apresentam deficiências, relatam sobrecarga de trabalho e interferência na sua qualidade de vida.

Palavras-chave: Cuidador; Acidente vascular cerebral; Qualidade de vida

INTRODUCTION

Considering the changes in the epidemiological profile in Brazil over the past decades, circulatory system diseases are among the leading causes of death, such as stroke, leading to an increase of individuals with neurological sequelae and dysfunctions[1-5].

Most individuals who survive a stroke experience motor, sensory, cognitive, or behavioral sequelae[1,4,5]. Functional deficits significantly interfere with daily life, with a loss or reduction in functional capacity (ability to make decisions and manage their life). This functional disability results in dependence on activities of daily living (ADL) due to difficulties in performing them without assistance[3-6].

Furthermore, due to limited financial resources to hire professional caregivers or family arrangements, the responsibility of providing permanent and ongoing care for the dependent individual often falls to a family member, referred to as the informal primary caregiver[2,4,7]. However, this family member often has limited knowledge of this role, which negatively affects their physical and mental health[2,8,9].

In this context, the functional dependency of these individuals ranges from the need for assistance or supervision in ADL to complete dependence[10,11], impacting the quality of life (QoL) of caregivers[12].

The International Classification of Functioning (ICF) is based on a biopsychosocial approach centered on the patient, encompassing the biological, individual, and social perspectives that influence health conditions, functionality, and human disability[13,14].

Moreover, the Informal Caregiver Burden Assessment Questionnaire (QASCI) was used to assess the burden of informal caregivers. The instrument includes information on health, social and personal life, financial situation, emotional status, and the type of relationship with the individual.

For QoL assessment, the World Health Organization QoL (WHOQOL-BREF) was used for the perception of individuals across various groups and situations[15].

Thus, investigating relevant aspects and events that may compromise the physical and mental health of caregivers is crucial, considering the need for appropriate support and optimization of the QoL.

Therefore, this study aimed to analyze the burden and perceived QoL of caregivers, correlating with the degree of disability in individuals with chronic stroke and their impairment in ADL.

METHODS

A cross-sectional, analytical study was conducted at the Specialized Rehabilitation Center (CER IV-IMIP, Recife, Brazil) from October 2018 to August 2019. The study was approved by the ethics committee in human research of IMIP (CAAE: 01904618.8.0000.5201). Individuals were included after the presentation, reading, and signing of the informed consent form following the resolution 466/12.

Individuals with chronic stroke (i.e., at least six months post-event) were assessed regarding their functional capacity or disability. Subsequently, their respective caregivers were evaluated for burden and QoL. The inclusion criteria were being the primary informal caregiver of an individual with chronic stroke without financial compensation and being under follow-up at CER IV – IMIP. Caregivers who had difficulty understanding the questionnaire and those caring for individuals who had died, been discharged, or withdrawn from the service during data collection were excluded from the study.

To classify the functionality or disability of individuals and factors that may influence their ability to perform ADL, the standard tool for Interdisciplinary Neurological Assessment was used based on the ICF.

First, an active search was conducted with the therapists for individuals with chronic stroke being monitored in the service. The lesion duration was identified using the medical records. Caregivers who met the inclusion criteria responded to the QASCI and WHOQOL-BREF instruments.

Statistical analysis was performed with data expressed as absolute and percentage frequencies for categorical variables and as measures of central tendency (mean, standard deviation [mean ± SD], median, 25th, and 75th percentiles) and range (minimum and maximum values) for numerical variables. To assess significant associations between two numerical variables, correlation coefficients were calculated, and Student's t-test was used to verify the null hypothesis of absence of correlation. Pearson correlation was used for normal data, and Spearman

correlation was used when normality was rejected in at least one of the variables. Normality was assessed using the Shapiro-Wilk test.

The significance level was $p < 0.05$ and the analysis was performed using IBM SPSS software (Version 23.0, SPSS Inc., Woking, Surrey, UK).

RESULTS

Thirty-eight individuals with chronic stroke were assessed regarding their functional capacity or disability, and their respective caregivers were evaluated for burden and QoL. Table 1 presents the results for "body functions" and "activities and participation" (including "mobility" and "self-care") as related to the ICF. Items "body functions related to muscle tone" and "dressing" showed the highest percentages for "severe disability", 34.2% and 36.8%, respectively. Related to a "complete disability", 36.8% of individuals cited the item "walking".

The mean scores for the physical, psychological, and social domains shown in Table 2 demonstrated that caregivers identify their QoL as "fair"; only the environmental domain was rated as "needs improvement". Furthermore, 55.4% of the caregivers were classified with an "intense burden".

Table 3 shows that none of the caregivers rated their QoL as "very good" in the "physical", "psychological", and "environmental" domains; 78.9% and 81.6% reported physical and psychological domains as "needs improvement" or "fair", respectively. In the social domain, despite one caregiver rating their QoL as "very good," 81.6% considered it as "needs improvement" or "fair".

Table 4 showed a significant positive correlation between the caregiver burden score and "body functions," indicating a direct relationship between caregiver burden and the level of dependency of the patient.

Table 1. Assessment of questions related to "body functions" and "activities and participation" according to the level of disability.

Variables	Level of disability									
	None		Mild		Moderate		Severe		Complete	
	n	%(1)	n	%(1)	n	%(1)	n	%(1)	n	%(1)
Body functions										
Body functions related to muscle strength	2	5.3	11	28.9	12	31.6	12	31.6	1	2.6
Body functions related to muscle tone	6	15.8	9	23.7	9	23.7	13	34.2	1	2.6
Activity and participation: mobility	11	28.9	12	31.6	7	18.4	5	13.2	3	7.9
Transferring oneself while lying down	7	18.4	11	28.9	9	23.7	6	15.8	5	13.2
Transferring oneself from sitting to standing	6	15.8	8	21.1	12	31.6	8	21.1	4	10.5
Maintaining a sitting position	27	71.1	7	18.4	1	2.6	1	2.6	2	5.3
Transferring oneself while sitting	12	31.6	14	36.8	4	10.5	4	10.5	4	10.5
Maintaining a standing position	2	5.3	18	47.4	6	15.8	5	13.2	7	18.4
Walking	6	15.8	3	7.9	10	26.3	5	13.2	14	36.8
Self-care										
Bathing	11	28.9	4	10.5	13	34.2	4	10.5	6	15.8
Dressing	7	18.4	5	13.2	5	13.2	14	36.8	7	18.4
Caring for body parts	7	18.4	12	31.6	10	26.3	3	7.9	6	15.8
Eating	17	44.7	11	28.9	5	13.2	2	5.3	3	7.9
Drinking	26	68.4	6	15.8	-	-	4	10.5	2	5.3
Managing toileting needs	14	36.8	13	34.2	4	10.5	3	7.9	4	10.5

(1) The percentage values were calculated based on the total sample (n = 38).

Table 2. Domains of the WHOQOL-BREF and caregiver burden.

Variable	Mean ± SD (CV)	Median (P25; P75)
Physical	54.98 ± 18.20 (33.10)	51.79 (41.96; 65.18)
Psychological	57.46 ± 16.89 (29.39)	58.33 (41.67; 70.83)
Social	50.22 ± 21.70 (43.21)	50.00 (33.33; 60.42)
Environmental	47.29 ± 13.88 (29.35)	46.88 (34.38; 56.25)
Caregiver burden (QASCI)	102.92 ± 16.90 (16.42)	107.50 (86.50; 115.50)

WHOQOL-BREF: "needs improvement" (0 to 49.99%); "fair" (50% to 74.99%); "good" (75.0% to 99.99%); and "very good" (100%). QASCI: scores < 46 are considered "no burden"; between 46 and 56, "mild burden"; and "severe burden" if > 56.

Table 3. Classification of caregivers according to the domains of the WHOQOL-BREF.

Domains	Needs improvement		Fair		Good		Very good	
	n	%	n	%	n	%	n	%
Physical	16	42.1	14	36.8	8	21.1	-	-
Psychological	12	31.6	19	50.0	7	18.4	-	-
Social	13	34.2	18	47.4	6	15.1	1	2.6
Environmental	20	52.6	17	44.7	1	2.6	-	-

Table 4. Spearman correlation between the total score of caregiver burden and the mean scores related to body function, activities, and participation.

Variable	Total caregiver burden score
Body function	0.360 (p =0.027*)
Mobility	0.242 (0.143)
Self-care	0.288 (0.080)

DISCUSSION

The inversion of the demographic pyramid, increased life expectancy, and the high incidence of individuals with stroke highlight the importance of studies on the QoL of caregivers[16]. Stroke results in a reduction or even a loss of functional capacity, directly influencing the ability to perform ADL independently. Most individuals experience motor impairments that affect their functional capacity, leading to deficits in occupational performance and dependency on basic and instrumental ADL.

From 38 individuals evaluated, only two did not have impairments in muscle strength or tone. Oliveira and Silveira observed that, following a stroke, individuals experience structural changes that limit their daily activities and social participation. Motor impairments (e.g., muscle weakness, spasticity, and abnormal movement patterns) may hinder or prevent transfers, ambulation, and the performance of basic and instrumental ADL, leading to physical dependence. These findings corroborate the profile of the individuals in our study and are consistent with Morais et al. (2012)[5] and Pereira et al.[5-7].

Regarding psychological burden, the present study supports a systematic review of interventions for caregivers of stroke survivors, in which mental health is the most negatively affected domain due to the demands of caregiving[5,6,10]. The psychological domain was the most impacted among caregivers in this study, with a mean score of 57.46 (± 16.89). Similar results were reported by Costa et al. (2015)[4], indicating a significant psychological and social impact on the QoL of caregivers, increasing the susceptibility to signs and symptoms of depression and anxiety[17].

In the present study, 78.9% of caregivers reported a QoL classified as "fair" or "needs improvement" in the physical domain. This finding is probably related to the highest mean levels of severe and complete impairments observed in functions of body

strength and muscle tone and activities such as walking and dressing. These tasks often require the presence of the caregiver and physical effort, particularly during transfers, which directly affects their QoL.

Moreover, individuals with functional failures from chronic pathologies frequently experience a slower disease progression, with episodes referred to as "crises of need". At each crisis, their functional capacity may deteriorate without recovery, leading to high dependency[4].

The QoL of the caregiver is affected by work overload, reduced family income, limited social and leisure activities, and the anticipation of future health problems, contributing to further deterioration in well-being.

Caregivers may be exposed to stress factors such as the lack of adequate guidance or support, reduced social and leisure activities, financial difficulties, and family dysfunction. Supporting this, 81.6% of caregivers scored "needs improvement" and "fair" in the social domain. Similarly, Morais et al. (2012)[5] reported that 80.3% of caregivers experienced disruptions in social and leisure activities, 49.2% stopped receiving or reduced visits at home, 47.5% did not maintain a good relationship with family members, and 31.1% had lost friendships[5].

A higher physical burden was reported, probably due to the degree of functionality and dependency of individuals[18]. This study reported an intense mean burden (mean > 56) according to the QASCI instrument. In addition, a positive and significant correlation was found between caregiver burden and body functions (muscle strength and tone), indicating that increased physical impairment in the individual leads to a higher caregiver burden due to the need for more assistance. Thus, caregivers are continuously required, considering the limited functional capacity of the individual[5]. Costa et al. (2015)[4] observed that the functional disability of individuals with chronic stroke, measured using the Barthel index, demonstrated increased caregiving requirements[17].

Furthermore, the treatment with regular and guided physical activities improved muscle fitness and functional capacity for daily activities. Additionally, it contributed to mental health, encouraging them to live with their limitations[18]. The increase in the mean functional capacity from 34.16 to 84.72 after six months of regular physical activity and the increase in the mean score from 45.55 to 94.00 in the "mental health" domain are evidence observed in a study that correlated QoL with physical exercise in individuals with chronic stroke[11]. This improvement may also benefit the health of caregivers, as a better overall health of the individual requires less of the caregiver, thereby reducing the care routine[19-23].

CONCLUSION

The caregivers reported an intense burden and a significant impact on their QoL, being at risk for physical and mental health problems. The act of caregiving itself is stressful, as it demands time and effort and may be exacerbated according to the functional capacity of the individual. Therefore, the care provided to individuals with chronic stroke needs changes, including actions from healthcare professionals at different levels of care.

AUTHOR CONTRIBUTIONS

TMM: Conceptualization, data acquisition, writing – original draft. **MROL and AMVCL**: Supervision, writing - review, and editing. All authors read and agreed with the final version of the manuscript.

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TOXICOLOGICAL SCREENING OF EXTRACTS FROM *CINNAMOMUM STENOPHYLLUM* ON *ARTEMIA SALINA LEACH*

TRIAGEM TOXICOLÓGICA DE EXTRATOS DE CINNAMOMUM STENOPHYLLUM FRENTE À ARTEMIA SALINA LEACH

Artur Danilo Novaes da Silva[1], Helder Carvalho Souza Lima Silva[1], Ricardo Prado Lyra[1], Bruno Lucêna de Lima[1], Daniela de Alencar Menezes[1], Gabriela Saraiva Dantas[1], Fabiana Lima Silva[2], Paulo Roberto, Hrihorowitsch Moreno[3], Thárcia Kiara Beserra de Oliveira[4,5], Joelmir Lucena Veiga da Silva[5]

[1] Student at research group of integrative and complementary practices at Faculdade de Medicina de Olinda (FMO), [2] Professor at the Institute of Health Sciences at Universidade Paulista (UNIP), [3] Professor at the Institute of Chemistry at Universidade Estadual de São Paulo (USP), [4] Professor at UNIFACISA, [5] Professor in the Research Group on Integrative and Complementary Practices at Faculdade de Medicina de Olinda (FMO)

ABSTRACT

Objective: To observe and compare the acute toxicity of the leaf (Csf) and stem extracts (Csc) from *Cinnamomum stenophyllum* against the brine shrimp *Artemia salina* Leach. **Methods:** Csf and Csc at concentrations of 1, 10, 100, and 1000 μg/mL were evaluated in acute toxicity assays on *A. salina* for 24 and 48 h, in triplicate. The number of dead nauplii was quantified, and the median lethal concentration (LC_{50}) values were calculated using non-linear regression. **Results:** Csf showed toxicity only at 1000 g/mL after 48 h ($p < 0.05$); therefore, the LC50 was not calculated. Csc exhibited toxicity only at 48 h of exposure (LC_{50} = 8.7 ± 0.7 g/mL), indicating high toxicity (LC50 < 100 μg/mL). **Conclusion:** Csf and Csc from *C. stenophyllum* presented active metabolites that induced toxicity in *A. salina* under high exposure conditions. These metabolites are possibly different substances or are more concentrated in the stem. This is the first report of such findings in the literature.

Keywords: Medicinal plant; Toxicity; Vegetal extract

RESUMO

Objetivo: Observar e comparar a toxicidade aguda de extratos das folhas (Csf) e do caule (Csc) de *Cinnamomum stenophyllum* em *Artemia salina* Leach. **Métodos:** Os extratos Csf e Csc, nas concentrações de 1, 10, 100 e 1000 μg/mL, foram utilizados nos ensaios de toxicidade aguda utilizando o microcrustáceo *A. salina*, sob exposição de 24 e 48 horas, realizados em triplicata. O número de náuplios mortos foram quantificados e a CL50 foram calculadas por regressão não-linear. **Resultados:** Os extrato Csf apresentou toxicidade apenas com a concentração de 1000 g/mL em 48hs ($p < 0,05$), sendo assim, a CL50 não foi determinada. Já o extrato Csc foi tóxico apenas na maior exposição, de 48hs, mostrando CL50 de 8,7 0,7 g/mL, considerada uma alta toxicidade (CL50 < 100 g/mL). **Conclusão:** As folhas e caule de *C. stenophyllum* possuem metabólitos ativos que levam toxicidade a *A. salina* quando em alta exposição, os quais, provavelmente são substâncias diferentes ou estão mais concentradas no caule. Estes resultados são os primeiros na literatura para a espécie estudada.

Palavras-chave: Extrato vegetal; planta medicinal; toxicidade

INTRODUCTION

Traditional medicine and medicinal plants have been extensively used in developing countries, according to the norms for health maintenance[1].

According to the National Poison Information System, intoxication caused by medicinal plants is the second leading cause of death by poisoning in humans. Several factors may contribute to this outcome, including limited knowledge regarding cultivation practices, incorrect plant identification, adverse reactions, drug interactions, dosage, and frequency of herbal medicine use[2].

The national guideline developed to support

and strengthen public health initiatives in Brazil is the National Policy for Integrative and Complementary Practices in the Unified Health System[3]. This policy initially encompassed the areas related to medicinal plants and phytotherapy, homeopathy, traditional Chinese medicine, acupuncture, and anthroposophic medicine. A more specific policy, the National Policy for Medicinal Plants and Herbal Medicines, was also implemented[4].

The Lauraceae family is distributed across tropical and subtropical regions and comprises approximately 52 genera (between 2,500 and 3,500 species)[5]. In Brazil, this family is important and includes 23 genera and 420 species[6], with many species producing aromatic oils and alkaloids used in perfumery and the pharmaceutical industry, such as *Cinnamomum camphora* (camphor) and *Aniba roseadora* (*pau-rosa*); the latter is a source of linalool, which is widely used in the cosmetics industry. Other species also produce edible fruits and culinary condiments, such as *Persea americana* (avocado), *Laurus nobilis* (laurel leaf), and *C. verum* (glycosylate)[9].

As no studies reported the toxicological screening for *C. stenophyllum*, we aimed to evaluate and compare the acute toxicity of crude ethanolic extracts from the leaf (Csf) and stem (Csc) of this specimen on the microcrustacean *Artemia salina* Leach.

METHODS

Leaves and stems of *C. stenophyllum* were macerated in ethanol (95%). Extracts were obtained by solvent removal using a rotary evaporator at 60° C. The extracts were provided by the Instituto de Química at Universidade de São Paulo (USP). To prepare the solutions, extracts were solubilized in Cremophor (0.1%) and diluted in distilled water to a concentration of 2.5 mg/mL. Serial dilutions were performed to obtain the desired concentrations[7]. *C. stenophyllum* (Meisn.) Vattimo-Gil, known as "*canela-vassoura*", is native to the Brazilian states of Minas Gerais, São Paulo, and Paraná[6,8]. Extracts from species of the genus *Cinnamomum* have been reported to possess astringent, carminative, blood-purifying, digestive, antiseptic, antifungal, antiviral, antibacterial, antioxidant, anti-inflammatory, immunomodulatory, hypolipidemic, and hypoglycemic properties[9]. Several chemical compounds have been reported in these species, including aldehydes, acetates, alcohols, terpenes, flavonoids, alkaloids, anthraquinones, coumarins, phenols, saponins, tannins, carboxylic acids, hydrocarbons, spathulenol, fatty acids, butanolides, lignans, steroids, propenoids, and kaempferol.

The *A. salina* assay was used to determine the acute toxicity[10]. A quantity of 0.3 g of *A. salina* cysts was incubated in synthetic seawater for 24 to 36 h under artificial lighting at 22° C. After hatching, ten nauplii were transferred to test tubes containing the extract solutions (1, 10, 100, and 1000 µg/mL) or the control (saline). After 24 and 48 h, the number of live and dead larvae was quantified. Larvae were considered dead when no active movement was observed for approximately 20 seconds. The median lethal concentration (LC_{50}) for each extract was determined using non-linear regression analysis based on the number of viable nauplii at each concentration. The assay was conducted in triplicate for each tested concentration.

Results were expressed as mean ± standard error of the mean (X ± s.e.m.) and analyzed using the t-test; a p-value < 0.05 was considered statistically significant. Analyses were performed using GraphPad Prism software.

RESULTS AND DISCUSSION

Tests using *A. salina* are commonly applied to investigate the potential toxic activity of plant-derived products and for the preliminary screening and assessment of therapeutic safety. Due to its ease of maintenance in laboratory environments, *A. salina* has become a standard model for toxicity testing[11,12]. The absence of cytotoxicity from the tested extracts in *A. salina* indicated that the plant material is well tolerated by this biological system.

Exposure to the Csf at different concentrations for 24 h did not affect *A. salina* viability compared with the control, indicating a lack of toxicity (Figure 1A). At 48 h of exposure, only the highest concentration (1000 g/mL) produced a statistically significant reduction in viability (Figure 1B). These results suggest that the stem of *C. stenophyllum* may contain active compounds that are not fully eliminated by the metabolism of *A. salina* when exposed to high concentrations, resulting in toxic effects.

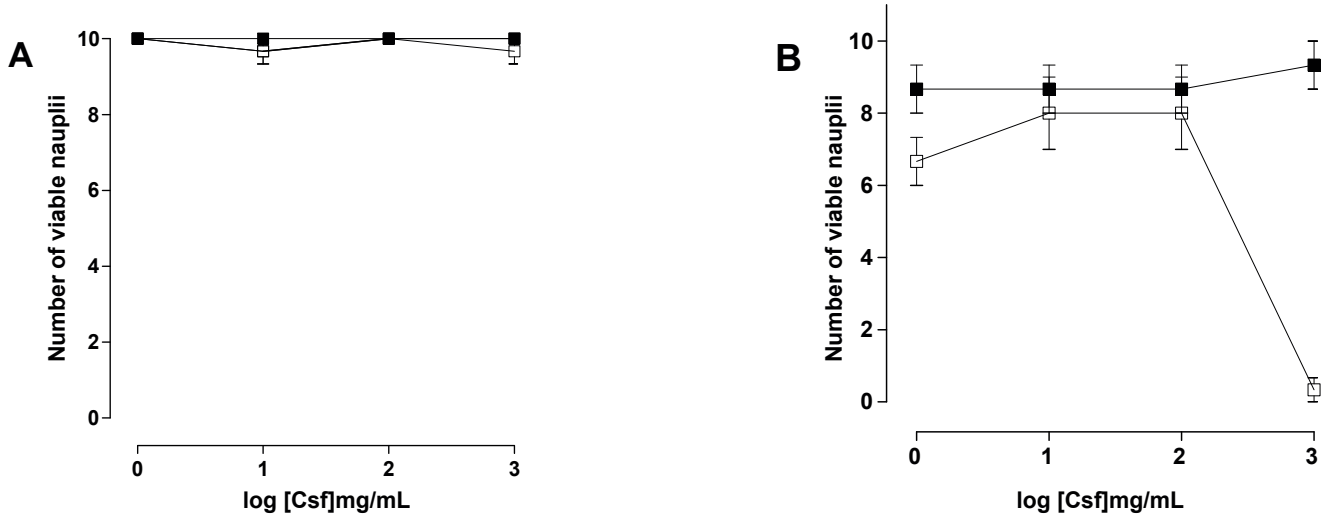

Figure 1. Viability of *Artemia salina* in the absence (■) or presence (□) of *leaf* extract (Csf) after 24 h (A) or 48 h (B) of exposure.

During the tests with the Csc (Figure 2), the mortality of *A. salina* was observed only after 48 h of exposure (Figure 2B); Csc produced an LC_{50} of 8.7 ± 0.7 g/mL, classified as highly toxic (LC_{50} < 100 g/mL)[10]. This toxicity was greater than that observed in the leaves and bark of *C. travancoricum*, *C. walaiwarense*, *C. wightii*, *C. verum*, *C. sulphuratum*, *C. riparium*, and *C. perrottetii*, and was performed in similar assays with *A. salina*[13]. The significant toxicity observed in the Csc suggests a potential for future cytotoxicity screening[14]. The greater toxicity of the Csc compared with the Csf of *C. stenophyllum* suggests that the active metabolites responsible for this effect may differ between plant parts or may occur at higher concentrations in the stem. Similar findings have been reported for bark extracts, which exhibited greater activity than the Csf of *C. travancoricum*, *C. walaiwarense*, *C. wightii*, *C. verum*, *C. sulphuratum*, *C. riparium,* and *C. perrottetii*[13].

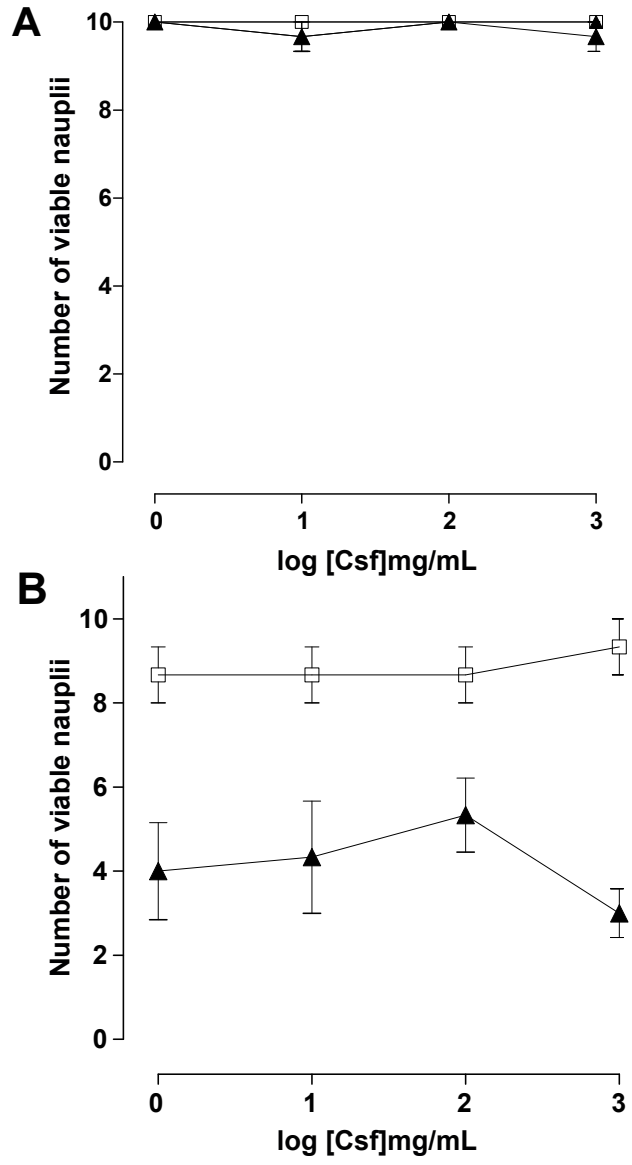

Figure 2. Viability of *Artemia salina* in the absence (□) or presence (▲) of stem extract (Csc) after 24 h (A) or 48 h (B) of exposure.

CONCLUSION

The leaves and stems of the *C. stenophyllum* contain active metabolites that cause toxicity to *A. salina* under prolonged exposure. The compounds responsible for this effect are probably different from those found in the leaves or are more concentrated in the stem. These are the first data reported for this plant specimen.

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ANATOMICAL VARIATION OF PULMONARY LOBULATION: A CADAVERIC STUDY

VARIAÇÃO ANATÔMICA DA LOBULAÇÃO PULMONAR: ESTUDO CADAVÉRICO

Pedro Henrique Leite Lima[1/*], Gilberto Cunha de Sousa Filho[2], Lucas Carvalho Aragão Albuquerque[3], Lucas dos Santos Accioly[3], Évellyn Bezerra Cordeiro[1], Fernando Augusto Pacífico[3]

[1] Student at the Faculdade de Medicina de Olinda - FMO, [2] Professor at the Departamento de Anatomia of the Universidade Federal de Pernambuco - UFPE. [3] Professor at the Faculdade de Medicina de Olinda - FMO.

ABSTRACT

Introduction: Surgeons must be aware of anatomical variations of the lungs during lobar or segmental resections. This knowledge prevents misinterpretation of radiological images when these variations are present. **Objectives:** To investigate the incidence of anatomical variations in the pattern of lobes and fissures of the lungs in human cadavers. **Methods:** Seventy-two human specimens were selected from the cadaveric collection of the Department of Anatomy at the Federal University of Pernambuco. Each lung was analyzed for laterality (right and left), presence of pulmonary fissures, and lobes. **Results:** Of the 72 lungs examined, 35 were right lungs, and 37 were left lungs. The left lungs did not present anatomical variations. Among the right lungs, two anatomical variations were identified in two distinct lungs. In the first case, the horizontal fissure was absent, resulting in only two pulmonary lobes. In the second case, an incomplete horizontal fissure was observed. No other variations were found in the remaining right lungs. **Conclusion:** Two anatomical variations in lobation and fissure patterns were found in the right lungs, corresponding to an incidence of 5.4%. No variations were found in the left lungs.

Keywords: Anatomy; Cadaver; Lung; Anatomic variation

RESUMO

Introdução: Os cirurgiões devem estar cientes das variações anatômicas do pulmão durante as ressecções lobares ou segmentares do pulmão. O conhecimento dessas variações impede a má interpretação das imagens radiológicas quando essas variações ocorrem. **Objetivo:** Investigar a incidência de variações anatômicas no padrão dos lobos e fissuras pulmonares em cadáveres humanos. **Método:** Setenta e dois humanos foram selecionados da coleção de partes de cadáveres do Departamento de Anatomia da Universidade Federal de Pernambuco. Em cada pulmão humano cadavérico foi analisado: lateralidade (direito e esquerdo), a presença de fissuras e lobos pulmonares. **Resultados:** Dos 72 pulmões humanos selecionados, 35 eram pulmões direitos e 37 pulmões esquerdos. Após a análise dos pulmões esquerdos, não foram observadas variações anatômicas quanto à lobulação pulmonar ou quanto às fissuras pulmonares. Na análise dos pulmões direitos, foram observadas duas variações em pulmões distintos. No primeiro caso, não foi observada a fissura horizontal e com isso o pulmão apresentou apenas dois lobos pulmonares, enquanto no segundo caso o pulmão apresentou uma fissura horizontal incompleta. Nos demais pulmões do lado direito não foram observados variações anatômicas quanto aos lobos e fissuras pulmonares. **Conclusão:** Foram observadas duas variações anatômicas no padrão lobar e das fissuras pulmonares no pulmão direito, correspondendo a uma incidência de 5,4%, bem como não foram encontradas variações nos pulmões esquerdos.

Palavras-chave: Anatomia; Cadáver; Pulmão; Variação anatômica

INTRODUCTION

The lungs are paired organs located laterally to the mediastinum, with distinct anatomical and morphological characteristics. The right lung typically presents horizontal and oblique fissures, dividing it into superior, middle, and inferior lobes. The horizontal fissure separates the superior lobe from the middle lobe, while the oblique fissure separates the middle lobe from the inferior lobe. The left lung is relatively smaller than the right due to the presence of the heart and has only the oblique fissure, which divides it into superior and inferior lobes.[1]

Although this is the most observed pattern[2,3], anatomical variations in lobar and fissural configuration must be anticipated and considered in lung morphology.[4,5]

In anatomical science, the term "normal" refers to the structure most often found in a sample population based on statistical data. According to Di Dio (1998), an anatomical variation is a deviation from the typical morphology that does not impair function and is considered within the normality limits.[6,7,12]

Anatomical variation in the arrangement of pulmonary lobes and fissures encompasses a wide range of possible configurations and positional differences. The most frequent alterations observed involve the oblique and horizontal fissures, which may be complete or incomplete, 8-10 potentially resulting in a reduced number of lobes or atypical division of lobes.[2] These variations can lead to misinterpretations or diagnostic errors during imaging examinations.[11] Studies have indicated that the presence of accessory fissures is associated with the spread of respiratory diseases to adjacent lobes due to the continuity of the pulmonary.

Thus, knowledge and disclosure of information regarding anatomical variations of the lungs are essential, as they enhance diagnostic accuracy and effective surgeries. Additionally, this information enriches academic understanding in the medical field, offering valuable insights for interpreting a wide range of clinical scenarios.[6,7]

Although many authors have investigated fissural and lobar variations using imaging techniques, few have done so via gross anatomical studies.[8]

Given the clinical and pathological relevance of these anatomical variations, this study aimed to report cases of morphological variation in the lobar and fissural patterns of the lungs based on a literature review and cadaveric dissection. The motivation for this report was further reinforced by the limited number of studies that describe or compare pulmonary anatomical variations using anatomical and morphometric approaches.

Based on these considerations, this study aimed to investigate the incidence of anatomical variations in the pattern of pulmonary lobes and fissures in human cadavers.

METHODS

Eighty human lungs were randomly selected from the cadaveric specimen collection of the Department of Anatomy at the Federal University of Pernambuco.

Lungs were included if they had dissected pulmonary lobes to allow its visualization, but without the removal of any lobe (i.e., lungs with intact lobes). Specimens were excluded if any pulmonary lobes had been removed or if fissures had been artificially created to expose the lung parenchyma for didactic purposes.

The study was conducted in two phases: (1) screening and selection of suitable lungs and (2) evaluation of pulmonary lobulation in the selected specimens.

Following the screening process, 72 cadaveric lungs were selected for analysis of lobulation. Each lung was assessed for laterality (right or left), and the presence and completeness of pulmonary fissures and lobes were recorded.

RESULTS

Of the 72 human lungs selected, 35 were right lungs, and 37 were left lungs; the latter did not present anatomical variations. Considering the right lungs, two anatomical variations were identified in two distinct specimens. In the first case, the horizontal fissure was absent, resulting in a lung with only two lobes. In the second case, an incomplete horizontal fissure was observed. No additional anatomical variations were found in the remaining right lungs.

Figure 1. Right lungs. A: Lung with normal lobes and fissures. B: Lung with an incomplete horizontal fissure. C: Lung with absence of the horizontal fissure and only two pulmonary lobes.

DISCUSSION

A study conducted in India analyzed variations in pulmonary fissures and lobes using 30 pairs of cadaveric lungs and reported that five right lungs lacked the horizontal fissure, while 19 exhibited a complete horizontal fissure. Additionally, 11 right and 14 left lungs presented incomplete oblique fissures. Two right lungs showed an absence of the horizontal fissure combined with an incomplete oblique fissure. Accessory fissures were observed in three left lungs and one right lung.[13]

A more recent study, conducted in southern India using 30 pairs of cadaveric lungs, identified 12 right lungs with incomplete fissures, seven left lungs with incomplete oblique fissures, two left and four right lungs with accessory oblique fissures, and five right lungs with an absent horizontal fissure. Compared with previous studies, a wide variation in major, minor, and accessory fissures was observed among different global populations.[14]

Bergmann, Afifi, and Miyauchi (2004), in one of their studies on the respiratory system, described a case in which a single pair of lungs was divided into 11 clearly defined lobes by fully developed pleural fissures. However, the lungs have the conventionally described five lobes, not separated by distinct fissures.[15]

Another frequent form of pulmonary variation is the absence of fissures. In a study of 277 lungs, the horizontal fissure was absent in 21% and incomplete in 67% of cases. Incomplete oblique fissures occurred in about 30% of both right and left lungs.[15]

CONCLUSION

Based on the findings, two anatomical variations in the lobar pattern and pulmonary fissures of the right lung were identified, corresponding to an incidence of 5.4%. No anatomical variations were observed in the left lungs.

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PREVALENCE OF SELF-MEDICATION AMONG SCHOOL ADOLESCENTS AGED FROM 15 TO 19 YEARS

PREVALÊNCIA DE AUTOMEDICAÇÃO ENTRE ADOLESCENTES ESCOLARES DE 15 A 19 ANOS

Luanna Kattaryna Penha de Araújo[1], Paulo Sávio Angeiras de Goes[1,2]

[1] Master's degree from Programa de Pós-graduação em Saúde da Criança e do Adolescente-UFPE, [2] Faculdade de Medicina de Olinda - FMO

ABSTRACT

Introduction: Studies focused on adolescents showed that they often practice self-medication; thus, the extent of this practice must be clarified. **Objectives:** To assess the prevalence of self-medication among school adolescents. **Methods:** This cross-sectional study was integrated with the "Study of oral and psychosocial health conditions among 15- to 19-year-old students in the municipality of São Lourenço da Mata - Pernambuco", the original study that was considered a baseline for a cohort with a primary data source. The study included adolescents enrolled in public schools. **Results:** A high percentage of adolescents practiced self-medication (64.7%). **Conclusion:** Self-medication was common among the population studied.

Keywords: Self-medication; Adolescents; Risk factors

RESUMO

Introdução: Estudos voltados para a população adolescente demonstram que a automedicação nesta faixa etária é frequente, sendo necessário conhecer em que medida estes indivíduos estão sujeitos a esta prática. **Objetivo:** Avaliar a prevalência da automedicação entre adolescentes em idade escolar. **Métodos:** Trata-se de um estudo de corte transversal, que se encontra integrada ao "Levantamento das condições de saúde bucal e psicossocial dos escolares de 15 a 19 anos do Município de São Lourenço da Mata – PE", sendo o estudo de origem um estudo de base para uma coorte com fonte de dados primários. A pesquisa foi realizada nas escolas públicas e incluídos os adolescentes de 15 a 19 anos, matriculados em escolas da rede pública de São Lourenço da Mata. **Resultados:** Os resultados apontam que um grande percentual da população adolescente local pratica a automedicação (64,7%). Conclusão: Pode-se concluir que a prática da automedicação é comum entre os adolescentes estudados.

Palavras-chave: Automedicação. Adolescente. Fatores de risco.

INTRODUCTION

Medication is an intervention accepted and used worldwide, recognized for its significant importance in health actions, and often plays a central role in current therapeutics. However, its use is not free of risks and may also be abused, causing as much harm as those caused by several drugs of licit or illicit use, such as dependence, withdrawal syndrome, and behavioral disorders.

Despite negative episodes, the relative "safety" offered by medication stimulates an immediate search for health through its common acquisition and use. This problem, according to Lefèvre (1987)[1], tends to confound the social, behavioral, cultural, and psychological determinants of diseases. Thus, in the context of a frequently unsatisfactory health system, the function of medication presupposes that diseases are organic phenomenons that may be solved using medication as a scientifically valid way of obtaining health, a highly desired value.

The pursuit of immediate health has increased rates of adverse effects associated with the inappropriate or unnecessary use of medications (or both). Therefore, economic, political, and cultural factors have contributed to the rise and disclosure of inappropriate medication use in Brazil and worldwide, characterizing it as a significant public health issue[2].

Self-medication is among the contributing factors to this issue. The term refers to the practice of an individual (or their responsible) choosing a medication and its administration for symptomatic relief or the perceived "cure" of a health problem without medical evaluation[3].

Therefore, self-medication represents the responsibility of the individual to improve their health and becomes problematic when it is generalized to all diseases[3,4].

Considering self-medication as a widespread practice, studies have attempted to elucidate its causes and consequences[2-4]. They observed a high prevalence among adults but a more cautious practice in older adults and young children populations, for whom the fear of undesirable reactions is greater due to their fragility.

In this context, the extension of this behavior among adolescents raises concern. A study conducted in the cities of Limeira and Piracicaba (São Paulo, Brazil) confirmed that children and adolescents often practice self-medication. The study reported that 56.6% of the adolescents interviewed had used medications in the 15 days preceding the study[4].

Understanding the mechanisms of medication usage among adolescents is important to identify negative influences caused by inadequate information and cultural aspects, as well as to verify how socioeconomic and emotional factors may increase self-medication. Thus, this study aimed to estimate the prevalence of self-medication among school adolescents.

METHODS

The study used data from the "Study of oral and psychosocial health conditions among 15- to 19-year-old students in the municipality of São Lourenço da Mata - Pernambuco" project. Developed in two stages, the project aimed to constitute a baseline for an adolescent cohort in a large urban center of the metropolitan region of Recife.

This cross-sectional study used primary data collection for a cohort investigation. This study design enabled the observation of the object of interest within the study population and the evaluation of its effects over time without influencing its course. The objective was to estimate the prevalence ratio of several oral health outcomes, and the prevalence of dental pain was used as a reference for the final sample calculation, estimated to be at 10% for this population according to local and regional studies.

According to the population census conducted by the Brazilian Institute of Geography and Statistics (IBGE) in 2011, the São Lourenço da Mata population (Pernambuco, Brazil) was estimated at 108,301 inhabitants, with an area of 264 km² and a population density above 100,000 inhabitants per km². The municipality has a mean Human Development Index of 0.653 and a GDP per capita of R$5,070.81 19.

Data provided by the Municipal Department of Education estimated that the public education system of São Lourenço da Mata has 49 municipal institutions (schools and daycare centers) and eight state schools.

Adolescents aged from 15 to 19 years (born between 1995 and 1999) of both genders enrolled in public state and municipal schools in the city of São Lourenço da Mata were evaluated. Data collection was conducted in 11 schools that had students within the age range, totaling 1,156 students, which represented 81.5% of the initially calculated sample. For sample calculation, the formula for comparing two proportions was used, a 1:1 ratio in the comparison groups, with a power of 80% to detect differences when presenting a random error of 2.5% and a 95% confidence interval.

Thus, based on a previously reported prevalence of self-medication among adolescents of 65.1%5, the sample was considered representative for estimating this practice in the target population.

The number of students from each school included in the sample was proportional to the number of students within the previously established age range of the respective school, setting a proportionality ratio. Adolescents were selected by sampling, starting with the first name on the list and alternating between a selected and a non-selected adolescent, excluding every twelfth selected name. This process resulted in the initial study sample.

Data quality control occurred by repeating the clinical examinations and questionnaires for every ten students. The results showed an acceptable degree of agreement for the questionnaire retest analyses ($r > 0.8$) and a satisfactory degree of agreement ($K = 0.8$ to 1.0) in clinical examinations for the different outcomes.

A minimum level of education and maturity was expected from the students included to respond to the self-administered questionnaire. Those with comprehension difficulties answering the questionnaire were excluded.

The original project was conducted follow-

ing Resolution no. 466/2012 of the National Health Council after the approval by the research ethics committee of the Universidade Federal de Pernambuco (CAAE: 45873515.1.0000.5208).

In this study, the dependent variable was self-medication, measured from the use (or not) of medications purchased and consumed without a prescription. Data collection was conducted at schools from September to December 2015 using non-clinical data obtained by a self-administered questionnaire. This test verified the presence or absence of self-medication and the factors related to this practice. Researchers discussed the questionnaire during its formulation and tested it on a small group of adolescents, later included in the sample, to verify the easiness of comprehension and correct information distortions and inconsistencies.

The instruments were applied in school environments that were available and reserved for the data collection, such as classrooms, auditoriums, libraries, or cafeterias. The application was made to groups of students after prior explanation and clarification of any doubts about the objectives and methods of the study.

Descriptive statistical analysis was performed using SPSS (version 21.0), employing absolute frequencies and percentages, with a 5% margin of error applied to statistical tests.

RESULTS AND DISCUSSION

Given the initial sample size (1,156 adolescents), some losses occurred during data collection. They were related to improperly completed questionnaires and students who refused to participate in the study or missed school on the day of application.

Thus, the final sample comprised 1,035 school adolescents. A sample loss of 21.72% of the initial sample was also observed in a similar study6, which was related to the absence of students on interview day, refusal to participate, and failure to submit the consent forms.

Therefore, given that the initial sample was calculated for a lower prevalence estimate (10%), the losses did not reduce statistical power for the predicted estimates.

The evaluation of the 1,035 valid questionnaires indicated the mean age of the students as being 15.63 years, with a standard deviation of 1.20 years and a median of 15.00 years.

The mean age of around 15 years old is an interesting fact when compared with the school grade that the adolescents occupy. Most (70.1%) of adolescents were enrolled between the first and fifth years of elementary school. This fact highlights an inconsistency regarding the guidelines of the Ministry of Education and Culture, which recommends that students finish their ninth year of middle school at the age of 14 years and start high school at 15 years[7].

Interestingly, when comparing this discussion with the number of adolescents who claim not to have failed any grades in their school curriculum (55.7%), the academic delay would not be related to the excessive number of failed grades but perhaps to dropping out and then returning later to school or late entry into basic education.

Table 1. Distribution of school adolescents according to sociodemographic data

Variable	n	%
Total	**1035**	**100.0**
Age		
14	176	17.0
15	365	35.3
16	256	24.7
17	161	15.6
18 or more	77	7.4
Gender		
Male	473	45.7
Female	562	54.3
Race		
White	226	21.8
Black	136	13.1
Brown (mixed race)	593	57.3
Yellow	34	3.3
Indigenous	46	4.4
Study years		
1st to 5th grades	726	70.1
6th to 9th grades	309	29.9
Failures at school		
Yes	459	44.3
No	576	55.7
Works?		
Yes	75	7.2
No	960	92.8

Regarding the education of mothers, only 15.6% have completed high school, and 19.1% have completed higher education. However, 22.2% of adolescents did not know the educational level of their mothers. Thus, this sample is homogeneous

when considering socioeconomic data.

Important aspects are related to the self-esteem of the adolescents (Table 2).

Table 2. Distribution of school adolescents according to sociodemographic data

Variable	n	%
Total	**1035**	**100**
Who works in the family?		
Only my father	410	39.6
Only my mother	226	21.8
Both works (father and mother)	311	30.0
None works	88	8.5
Education of mother		
Early middle school (1st to 4th grades)	148	14.3
Later middle school (5th to 8th grades)	285	27.5
High school (1st to 3rd grades)	161	15.6
Higher education	198	19.1
Never went to school	13	1.3
Do not know	230	22.2
Situation of the house		
Owned	887	85.7
Rented	117	11.3
Living as a guest	9	0.9
Alcohol consumption		
Yes	66	6.4
No	969	93.6
Practice of leisure activities		
Yes	340	32.9
No	695	67.1
Self-esteem Low		
Moderate	510	49.3
High	249	24.1

Most students had moderate self-esteem (49.3%), requiring special attention to these cases, especially those who reported low self-esteem. This condition may contribute to emotional instability and a sense of not belonging to the group in which they are inserted, potentially leading to depressive episodes. These episodes may result in harmful behaviors to health, such as alcohol consumption and tobacco use, as well as self-medication.

Studies have demonstrated how self-esteem can modulate behaviors, with this construct having been positively associated with high self-esteem with age and positive oral health behaviors, regardless of the gender of adolescents[8].

When these relationships are addressed, they reveal that substance use is a learned pattern of behavior motivated by the desire to reduce negative moods at the time. Therefore, other factors could be related to this process, such as the presence of conflicting relationships with parents and family, friends, and partners[9].

Habits related to the use of alcohol, tobacco, and medications are different forms of behavioral expression; however, they arise from the use of toxic substances with the potential to relieve stress and represent behaviors linked to adult life. Therefore, common motivations may elicit these behaviors represented by social circumstances[10].

In this sense, few adolescents consumed alcohol (6.4%), contradicting previous studies[9,10]. The lack of leisure activities may also influence this process, as 67.1% of the population studied did not practice leisure activities.

The present study estimated that 64.7% (670 of the 1,035) of adolescents used medications without a prescription from a qualified professional. In this sense, through the interval technique, our estimation with 95% reliability was that the percentage of adolescents who practice self-medication in the population studied varies from 61.8% to 67.6%. Thus, the result was slightly higher than that of other studies on the theme, whether they were conducted in a school environment or not. For example, a study conducted in Maringá (Paraná, Brazil) with adolescents from public and private schools reported a prevalence of 52.6%, with higher rates among females[6].

In another study, the prevalence of self-medication was estimated via a survey in the cities of Limeira and Piracicaba (São Paulo, Brazil), indicating a prevalence of 56.6%[4]. However, addressing adolescents aged 18 years living in the city of Pelotas (Rio Grande do Sul, Brazil), a third study found that self-medication corresponded to 65.1% (with a 95% confidence interval ranging from 62.8% to 67.4%)[5], corroborating our results. These variations may be multifactorial, being attributed to regional differences between the cities evaluated, as well as variations in age groups and environments used for data collection. Moreover, the first two studies adopted a recall period of 15 days prior to the interview, a fact that may have limited the number of references to the practice of self-medication compared with the present study, which had no limited period.

CONCLUSION

The findings of the present study are concerning, as the use of medications without proper guidance (driven by limited knowledge and low autonomy among adolescents) represents significant risks. These risks stem from factors, such as the questionable quality of pharmaceutical products, improper storage of the medications at home (i.e., often maintained without professional guidance and composed of leftovers from previous treatments), and the selection of inappropriate medications.

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ORIGINAL ARTICLE

AVAILABILITY OF INFORMATION TO THE POPULATION ON THE MAIN DRUGS USED FOR CHRONIC PAIN TREATMENT

DISPONIBILIDADE DE INFORMAÇÃO À POPULAÇÃO SOBRE OS PRINCIPAIS FÁRMACOS UTILIZADOS PARA O TRATAMENTO DA DOR CRÔNICA

Catarina Vidal de Moura, Sarah Silva Bezerra[1], Thais Milla Franco de Freitas[1], Joyce Ferreira Gomes de Oliveira[2], Raphaella Amanda Maria Leite Fernandes[3]

[1] Medical student at Centro Universitário Maurício de Nassau, [2] Student at Universidade de Pernambuco (UPE), Pernambuco, Brazil, [3] Academic coordinator of the Faculdade de Medicina de Olinda (FMO), Pernambuco, Brazil.

ABSTRACT

Introduction: Pain is defined as a sensory and emotional experience associated with actual or potential tissue damage or description of this damage. It is a common reason for seeking medical attention and negatively impacts daily activities. Also, pain is characterized as chronic when it persists for longer than three months, which does not require immediate tissue injury to trigger persistent painful stimuli. The lack of professional training and myths on pain management may lead to unwarranted fears, such as those related to the adverse effects of drugs. Therefore, adequate information is crucial for healthcare professionals and patients involved in managing chronic pain. **Objectives:** To evaluate the availability of information regarding pharmacological treatments of chronic pain for the general population, focusing on identifying limitations in patient information leaflets. **Methods:** Patient information leaflets were analyzed for indications related to chronic pain management, and four drug classes were included: anticonvulsants, tricyclic antidepressants, benzodiazepines, and selective serotonin reuptake inhibitors. **Results:** Of 62 drugs evaluated, 37 (59.68%) had publicly available information, whereas 25 (40.33%) did not. Among those with public information, 13 (35.14%) explicitly stated an indication for chronic pain management. **Conclusion:** A relevant knowledge gap exists among the general population due to limited or absent data on indications for chronic pain treatment in most patient information leaflets. Therefore, this topic requires further attention to enhance the understanding of health professionals and patients and improve chronic pain management.

Keywords: Chronic pain; Medicine package inserts; Access to information

RESUMO

Introdução: A dor é definida como uma experiência sensitiva e emocional, associada ao dano tecidual real ou potencial, ou à descrição desses danos. É uma causa frequente de busca ativa por atendimento médico, com impacto negativo nas atividades diárias. A dor é crônica quando tem duração maior que três meses e o seu mecanismo de ação não necessita de lesão instantânea para desencadear o estímulo álgico e contínuo. A falta de treinamento e os mitos podem levar, por exemplo, a medos descabidos dos efeitos adversos de medicações. Dessa forma, as informações adequadas são essenciais para todos os profissionais de saúde e pacientes envolvidos com o tratamento da dor crônica. **Objetivos:** Promover uma pesquisa da prevalência de informações disponíveis sobre o tratamento farmacológico das dores crônicas para a população em geral. Além disso, demonstrar a limitação dos dados contidos nas bulas medicamentosas e a disponibilidade de acesso da população a essas informações. **Métodos:** Foram analisadas bulas de medicamentos à procura de indicação para o tratamento da dor crônica. Foram consideradas 4 classes de fármacos utilizadas no tratamento da dor crônica, as quais são: anticonvulsivantes, antidepressivos tricíclicos, benzodiazepínicos e inibidores seletivos da recaptação de serotonina. **Resultados:** Dos 62 fármacos pesquisados, 37 (59,68%) estavam disponíveis para consulta gratuita, sendo 25 (40,33%) indisponíveis. Desses 37 disponíveis, 13 (35,14%) tinham indicação formal na bula para o tratamento de algum tipo de dor crônica. **Conclusão:** Existe um prejuízo para a população geral no conhecimento sobre condições dolorosas crônicas uma vez que as bulas, em sua maioria, têm restrição de dados ou a falta de indicações para o tratamento da dor crônica. Além disso, observa-se que é necessária uma melhor abordagem deste tema para os profissionais de saúde e pacientes, em especial, objetivando um manejo mais bem conduzido.

Palavras-chave: Dor crônica; Bulas de medicamentos; Acesso à informação

INTRODUCTION

According to the International Association for the Study of Pain, pain is defined as a sensory and emotional experience associated with actual or potential tissue damage or description of this damage. It is a prevalent, subjective, and personal symptom that ranks among the most common reasons for seeking medical attention and negatively affects daily activities, including work and leisure.[1-5]

Severe pain demands substantial investment from healthcare systems and commitment from patients and society, being recognized as a public health priority.[5,6]

In this sense, untreated chronic pain or inadequate treatment becomes a critical health issue due to the impairment of the quality of life and worsening of patients diseases, compromising their functionality.[7] Therefore, effective chronic pain management requires the identification of underlying pathophysiological mechanisms of pain and accurate diagnosis to ensure appropriate pharmacological strategies.[4,8]

In addition to the conventional analgesics, benzodiazepines, tricyclic antidepressants, anticonvulsants, and selective serotonin reuptake inhibitors (SSRI) are often employed in the chronic pain management.[8] Despite substantial evidence supporting the efficacy of numerous drugs for chronic pain treatment, many of them do not list chronic pain among their formal indications in the patient information leaflets.[1]

In this context, the lack of formal indication in patient information leaflets may lead to treatment nonadherence since patients may infer that the drug should not have been prescribed, abandoning the recommended treatment. Also, the lack of health professional training on chronic pain treatment may lead to inadequate management due to insecurity in prescribing these drugs.[7,9]

The limited availability of patient information leaflets for public consultation may hinder treatment adherence. Also, some leaflets have incomplete information, without a formal indication for chronic pain treatment.

This study aimed to evaluate the availability of public information on pharmacological treatments for chronic pain.

METHODS

This review analyzed publicly available patient information leaflets of drugs for chronic pain treatment. Four pharmacological classes were analyzed: benzodiazepines, anticonvulsants, tricyclic antidepressants, and SSRI.

Data were collected by retrieving patient information leaflets in full text or summary, in English or Portuguese. Data were analyzed using direct counting, and results were presented as comparative graphs.

RESULTS

This study evaluated benzodiazepines, anticonvulsants, tricyclic antidepressants, and SSRI. A total of 62 drugs were investigated; 37 (59.68%) had publicly available patient information leaflets, whereas 25 (40.33%) did not. Of the 37 drugs with available patient information leaflets, only 13 (35.14%) presented a formal indication for chronic pain treatment.

A categorical analysis using pharmacological classes revealed that the SSRI had the highest availability of patient information leaflets (100%), followed by anticonvulsants (70.58%), tricyclic antidepressants (57.14%), and benzodiazepines (46.87%).

Most drugs (64.86%) across all pharmacological classes had no formal indication for chronic pain treatment in their patient information leaflets. Moreover, of the six (100%) SSRI, only one (16.6%) mentioned the formal indication for chronic pain treatment, and of the twelve (70.58%) anticonvulsants with publicly available patient information leaflets, only five (29.41%) presented this formal indication. Of the four (57.14%) tricyclic antidepressants with available information, two (50%) presented indication for chronic pain treatment, and of the fifteen (46.87%) benzodiazepines, six (40%) presented an indication.

Discrepancies were observed between the number of drugs with indications for chronic pain treatment in patient information leaflets and scientific literature. Although all six (100%) SSRI had literature support for chronic pain treatment, only one (16.6%) included this indication in its patient information leaflet. For anticonvulsants, eight (66.66%) of twelve (70.58%) available drugs presented support in the literature for chronic pain treatment, whereas only five (41.66%) had a formal indication

in patient information leaflets. All four tricyclic antidepressants with publicly available patient information leaflets (57.14%) had literature support for chronic pain, but only two (50%) presented this indication in the patient information leaflets. Of the 15 (46.87%) benzodiazepines, 9 (60%) had recommendations supported by literature, whereas six (40%) presented formal indication for chronic pain in patient information leaflets.

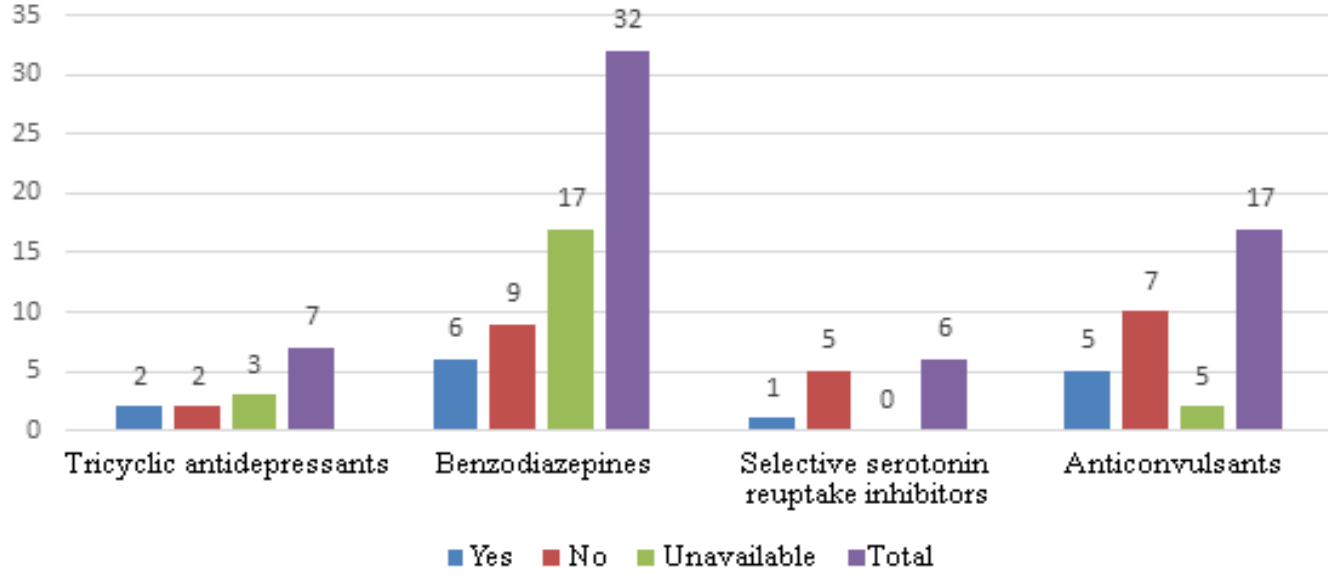

Figure 1. Prevalence of drugs with formal indication for chronic pain treatment. Blue: indication for chronic pain treatment stated in the patient information leaflet. Red: indication for chronic pain treatment supported by literature. Green: number of patient information leaflets unavailable for public consultation. Purple: total number of drugs in each pharmacological class.

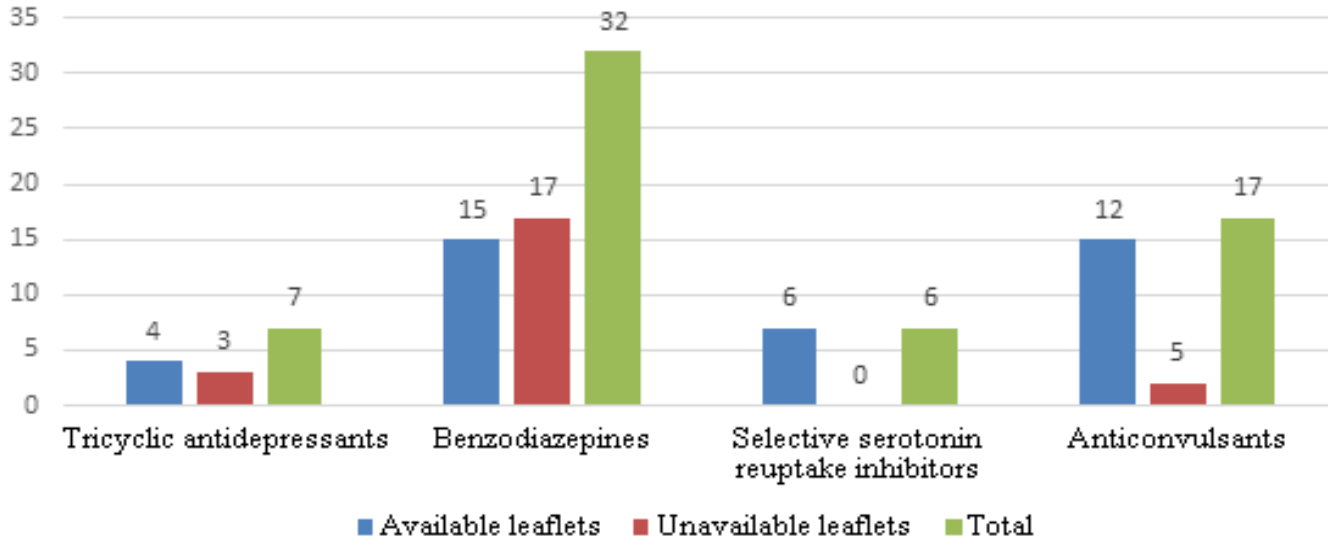

Figure 2. Public availability of patient information leaflets. Blue: number of drugs with publicly available patient information leaflets. Red: number of drugs without publicly available patient information leaflets. Green: total number of drugs per pharmacological class.

DISCUSSION

This study examined patient information leaflets from four major pharmacological classes commonly used in the treatment of chronic pain (i.e., benzodiazepines, anticonvulsants, tricyclic antidepressants, and SSRI). Also, a comparative analysis was conducted between the formal indications documented in the patient information leaflets and recommendations supported by scientific literature. Thus, this approach allowed a critical analysis of the importance of these drugs in chronic pain treatment and potential consequences of the lack of information and guidance for healthcare teams and the general population in managing this condition.

Adequate information regarding the mechanism of action of each drug is essential since many drugs used in chronic pain treatment require one or more weeks of continuous use to induce analgesic effects.[10] Thus, the absence of clear instructions may cause overdose or discontinuation of the treatment since patients may misinterpret a delayed therapeutic response as inefficacy. This issue is particularly exacerbated in countries or settings with limited resources, where health literacy levels are typically low.[11] Therefore, improved access to treatment indications in patient information leaflets is needed for understanding clinical management, nature of the disease, and adverse effects of the drugs, particularly tricyclic and tetracyclic antidepressants.

Tricyclic antidepressants

Tricyclic antidepressants are one of the most used adjuvant drugs in the chronic pain treatment. Also, amitriptyline, clomipramine, and nortriptyline at low doses exert direct analgesic effects in chronic pain and enhance the analgesia provided by other drugs.[3]

According to Hirsch and Birnbaum (2017)[10], the prescription of these drugs should consider their common adverse effects, the need to take them as prescribed rather than on an as-needed basis, and the expectation that a response or remission may not occur in less than four weeks after reaching the therapeutic dose. Amitriptyline, imipramine, desipramine, and nortriptyline are the most frequently prescribed tricyclic antidepressants in the United States, while clomipramine is commonly prescribed in Europe. Tricyclic antidepressants have different ranges of adverse effects, which are often considered when selecting the drug. Notably, nortriptyline and desipramine are generally better tolerated.[10]

The selection of a tricyclic antidepressant is generally guided by its adverse effects characteristics, which differ among the many available drugs. The tertiary tricycles, such as amitriptyline, clomipramine, doxepin, imipramine, and trimipramine, typically produce more adverse effects than other tricyclic antidepressants. Nortriptyline and desipramine generally have the best overall tolerability.[10]

Most antidepressants are dangerous in overdose, with toxicity generally linked to QT interval prolongation, which may lead to arrhythmia. An overdose of tricyclic antidepressants may also result in anticholinergic toxicity and seizures. In addition, these drugs are highly lipophilic and protein-bound; thus, they are not effectively removed by hemodialysis. Consequently, clinicians should avoid prescribing tricyclic antidepressants to outpatients at possible high risk for intentional overdose.[12]

In this context, tricyclic antidepressants provide actual therapeutic benefits for chronic pain conditions when properly prescribed (i.e., adequate treatment duration and dosage) since 100% of the drugs evaluated in the present study had indications documented in scientific literature. However, a relevant limitation was observed; only slightly over 50% of patient information leaflets were publicly available, distancing the information in literature from public access, especially for the affected population.

Selective serotonin reuptake inhibitors

SSRI are drugs that inhibit the serotonin reuptake, reducing the action of presynaptic serotonin reuptake transporter by 60% to 80%, which increases the availability of serotonin in the synaptic cleft and enhances the occupancy of postsynaptic serotonin receptors. Also, SSRI have little or no effect on the reuptake of other neurotransmitters, such as norepinephrine. The drug should not exert an effect on other reuptake mechanisms, receptors, or enzymes to be fully effective.[13] Escitalopram, citalopram, fluoxetine, fluvoxamine, paroxetine, and sertraline are some examples of SSRI.[14]

In recent years, SSRI have emerged as potential alternative treatments for chronic pain due to their favorable profile and fewer adverse effects than other classes of antidepressants, particularly tricyclic antidepressants.[15]

Overall, SSRI have good tolerability, and

adverse effects include headache, nausea, gastrointestinal disturbances, fatigue, insomnia, anxiety, and depressive symptoms. The reviewed studies indicated that adverse effects occurred in 20% to 84% of patients; however, treatment was limited in only 0% to 41% of cases.[16]

This study analyzed patient information leaflets of six SSRI, revealing that only one (16.67%) had a formal indication for chronic pain. Although all SSRI are clinically used for chronic pain treatment, five (paroxetine, sertraline, escitalopram, fluvoxamine, and citalopram - 83.33%) lacked formal indications for this condition in the patient information leaflets. Thus, although all patient information leaflets of SSRI were publicly available, the findings underscored a critical need for alignment between scientific literature and regulatory documents since the absence of an indication for chronic pain treatment may contribute to patient nonadherence.

Anticonvulsants

Anticonvulsants act on ion channels, such as sodium and calcium, by blocking synaptic transmission involved in epileptic seizures and neuropathic pain since they have similar pathophysiological and biochemical mechanisms, such as N-methyl-D-aspartate receptor activation. Drugs that block sodium channels act by reducing the active phase of neuronal firing, inhibiting the rapid generation of action potentials during depolarization. In addition, the synaptic blockade limits fluctuations in neuronal ionic gradients. This class includes carbamazepine, phenytoin, and lamotrigine.[3]

Calcium channel blockers include gabapentin and pregabalin.[17] These drugs present specific therapeutic indications based on their mechanism of action. In this case, they play a key role by prolonging the refractory period between nerve impulses, limiting high-frequency firing induced by persistent depolarization that causes paroxysmal pain and enhancing central synaptic inhibition.[3]

According to Park and Moon (2010)[8], anticonvulsants have had an important role in pain management since the 1960s and remain one of the most clinically relevant classes in chronic pain treatment, along with antidepressants. Thus, neuropathic pain, trigeminal neuralgia, and postherpetic neuralgia can be adequately managed, particularly by alleviating intense, paroxysmal, and lancinating pain, such as that in cancer. This class of drugs tends to be more effective for these conditions than for pain related to paresthesia, such as burning sensations and allodynia.[8]

According to Longo et al. (2013)[18], carbamazepine and phenytoin were the first drugs shown to alleviate pain related to trigeminal neuralgia. Also, Alves Neto et al. (2009)[3] identified carbamazepine as the drug of choice for treating this condition and reported its use in managing neuralgic symptoms in diabetic neuropathy, especially when patients described electric shock-like pain. However, Goodman (2006)19 stated that this therapeutic effect is often limited to initial relief, with only 70% of patients achieving lasting symptom control.

Carbamazepine is also indicated for other types of neuropathic pain, including peripheral neuropathy, postherpetic neuralgia, myofascial pain, complex regional pain syndrome, central neuropathic pain, and idiopathic glossopharyngeal neuralgia.[18] However, the present study found that the patient information leaflet of carbamazepine has no indication for several conditions, such as peripheral neuropathy, myofascial pain, complex regional pain syndrome, and central neuropathic pain.

This study evaluated the patient information leaflets of 17 anticonvulsants, but only 12 (70.58%) were available for consultation. Of these, only 5 (41.66%) mentioned chronic pain. Thus, more than half of the available patient information leaflets have no indication for chronic pain, which may compromise the understanding of patients on the therapeutic purpose of their prescribed drugs.

None of the patient information leaflets distinguished dosage regimens for epilepsy and chronic pain treatment. Therefore, this lack of guidance may contribute to incorrect dosing since different pathologies require different dosages.

Anticonvulsants may require high doses to achieve efficacy, which may cause sedation if not appropriately dosed.[18] Older adults are particularly vulnerable to adverse effects due to their physical frailty and common comorbidities, which may interfere with drug metabolism. Therefore, the availability of comprehensive information through all communication channels is essential to properly inform about the risks and benefits of these drugs.

The lack of adequate information in patient information leaflets may add a further barrier to effective treatment: functional impairment from inad-

equate drug use due to inappropriate dosing intervals or high dosages. Despite these limitations, anticonvulsants remain one of the drug classes with the highest rates of publicly available patient information leaflets (70.58% of availability). However, more than half of the patient information leaflets (66.66%) had no formal indication for chronic pain treatment.

Benzodiazepines

Benzodiazepines are drugs that act on the central nervous system by modulating the GABA receptor complex, increasing presynaptic inhibition of afferent fibers from the spinal cord. Generally, they act as tranquilizers or anxiolytics and have muscle-relaxant activity. Thus, benzodiazepines have been mainly used as adjuvant therapy to enhance the effects of drugs for analgesia and manage emotional manifestations (common in patients with chronic pain) without causing excessive sedation. Currently, benzodiazepines are often prescribed for the treatment of some conditions, such as fibromyalgia syndrome.[2]

In this sense, a relevant obstacle was observed in providing information on the indications of benzodiazepines for chronic pain treatment. Of the 31 benzodiazepines analyzed, only 15 (46.87%) had publicly available patient information leaflets. Of these, only six (40%) had a formal indication for chronic pain treatment, whereas nine (60%) were supported by scientific literature.

A previous study indicated that patients using benzodiazepines should be warned about decreased attention, which may increase the risk of accidents involving vehicles and other psychomotor activities.[21] Thus, the importance of information related to chronic pain treatment in the patient information leaflets of benzodiazepines becomes evident since patients with chronic pain may consider the dose prescribed by the physician insufficient due to their prolonged suffering. Consequently, they may use increased doses or reduced administration intervals, leading to intense central nervous system or respiratory depression.

Another concern regarding the benzodiazepines includes the high number of drugs commercialized, but with the lowest rate of publicly available patient information leaflets. Moreover, this class may have difficult management due to the potential adverse effects in cases of overdose, tolerance, and serious harm to the health of patients if misused, especially by those poorly informed.

CONCLUSION

Access to information about treatment options for chronic pain conditions is currently limited since the main source of information is the patient information leaflet. The information available for the population is limited due to the lack of publicly available patient information leaflets and their limited content (usually incomplete) since more than half of those publicly available had no indication for chronic pain treatment.

In this context, the myths and lack of knowledge on drugs may foster unwarranted fears related to adverse effects and misconceptions about dependency risks.

The pharmaceutical industry must review its practices to improve disclosure related to the indication of drugs for chronic pain treatment and provide free access to patient information leaflets containing comprehensive information to achieve adequate therapeutic outcomes.

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BACTERIOLOGICAL PROFILE OF LOWER RESPIRATORY TRACT INFECTIONS IN PATIENTS ADMITTED TO THE PULMONOLOGY WARD AT A TERTIARY HOSPITAL REFERENCE IN LUNG DISEASES IN THE STATE OF PERNAMBUCO

PERFIL BACTERIOLÓGICO DAS INFECÇÕES DO TRATO RESPIRATÓRIO INFERIOR EM PACIENTES INTERNADOS NA ENFERMARIA DE PNEUMOLOGIA EM HOSPITAL TERCIÁRIO DE REFERÊNCIA EM DOENÇAS PULMONARES NO ESTADO DE PERNAMBUCO

Sérgio Manoel Lemos de Carvalho[1/*], Joyce Ferreira Gomes de Oliveira[2], Liana Gonçalves Macedo[3], Lucas dos Santos Accioly[3], Raphaella Amanda Maria Leite Fernandes[4]

[1] Discente da Faculdade de Medicina de Olinda (FMO), Discente da Universidade de Pernambuco (UPE), Médico Pneumologista, [2] Coordenadora Acadêmica da Faculdade de Medicina de Olinda (FMO).

ABSTRACT

Introduction: Respiratory tract infection is responsible for high morbidity and mortality, and frequent use of antibiotics. It is important to understand the bacteriological profile according to the evaluated location and condition of the patient since, on many occasions, the treatment of these infections is initiated empirically. **Objective:** The aim was to identify the bacteriological profile of cultures of sputum and bronchoalveolar lavage and verify the underlying lung disease of patients hospitalized in the pulmonology ward of the reference hospital in lung diseases of the state of Pernambuco. **Methods:** In this retrospective study, cultures of sputum, bronchoalveolar lavage, or both of 70 patients were analyzed. **Results:** The most prevalent bacteria in sputum cultures were *Pseudomonas sp*. (24%) *and Klebsiella sp.* (21%). Any pathogen was predominant in the cultures of bronchoalveolar lavage. Bronchiectasis was the most prevalent pulmonary disease with pulmonary tuberculosis after-effects, and a significant relationship between their presence and the infection by *Pseudomonas sp.* ($p < 0.05$) was found. **Conclusion:** The finding of *Pseudomonas sp.* as the most common bacteria, particularly in patients with bronchiectasis by pulmonary tuberculosis after-effects and *Klebsiella sp.* as the second most common, although not associated with any underlying lung disease, may assist in selecting empirical therapy of patients admitted to the pulmonology ward.

Keywords: Bacteria; Culture media; Bronchiectasis; Chronic Obstructive Pulmonary Disease. Pneumonia

RESUMO

Introdução: A infecção do trato respiratório é responsável por elevada morbimortalidade, além de levar ao uso frequente de antibióticos. É importante o conhecimento do perfil bacteriológico de acordo com o local avaliado e a doença de base do paciente, uma vez que, em muitas ocasiões, o tratamento dessas infecções é iniciado empiricamente. Objetivo: Identificar o perfil bacteriológico das culturas de escarro e dos lavados broncoalveolares e verificar a doença pulmonar de base dos pacientes internados na enfermaria de Pneumologia de um Hospital Terciário referência em doenças pulmonares do estado de Pernambuco. **Métodos:** O estudo consistiu de uma série de casos retrospectiva, onde foram analisadas as culturas de escarro e/ou do lavado broncoalveolar de 70 pacientes. **Resultados:** Os patógenos mais prevalentes nas culturas de escarro foram a *Pseudomonas sp.* e a *Klebsiella sp.*, presentes, respectivamente, em 17 (24%) e 15 (21%) pacientes. Não houve predomínio de qualquer patógeno nas culturas dos lavados broncoalveolares. A doença pulmonar de base mais prevalente foi a bronquiectasia por sequela de tuberculose pulmonar, havendo relação significativa entre a sua presença e a infecção por *Pseudomonas sp.* ($P < 0,05$). **Conclusão:** O encontro de *Pseudomonas sp.* como a bactéria mais prevalente, principalmente em pacientes que apresentam bronquiectasia por sequela de tuberculose pulmonar, assim como o achado de *Klebsiella sp.* como o segundo patógeno mais frequente, ainda que não associado a alguma doença pulmonar de base, poderão auxiliar na escolha da terapia empírica de pacientes internados na enfermaria de Pneumologia de um Hospital Terciário de Referência em doenças pulmonares.

Palavras-chave: Bactéria. Meios de cultura. Bronquiesctasia. Doença Pulmonar Obstrutiva Crônica. Pneumonia

IINTRODUCTION

Acute respiratory tract infections highly increase morbidity and mortality rates, leading to frequent antibiotic use.[1]

Due to diverse etiologies and the time required for bacteriological diagnosis, the treatment is often initiated empirically.[2]

Knowing the local bacteriological profile is essential since the prevalent bacterial flora and the pattern of antimicrobial resistance may vary according to the geographic region [1] and of the patient underlying disease.

The bacteriological predominance described in the literature, according to the underlying pulmonary pathology, shows that the most frequently isolated bacteria in patients with exacerbations of chronic obstructive pulmonary disease (COPD) are non-typable *Haemophilus influenzae*, *Moraxella catarrhalis*, and *Streptococcus pneumoniae*[3]. *Pseudomonas aeruginosa* and *Enterobacteria* are also commonly isolated, particularly in patients with severe COPD[3,4]. In patients with bronchiectasis, the most frequently bacteria include *H. influenzae*, *M. catarrhalis*, *Staphylococcus aureus*, *P. aeruginosa* (especially the mucoid type), and, to a lesser extent, *S. pneumoniae*[5]. Approximately one-third of these patients are chronically colonized by *P. aeruginosa*[6]. In relation to community-acquired pneumonia (CAP), the most frequent are *S. pneumoniae*, followed by atypical bacteria such as *Mycoplasma pneumoniae* and *Chlamydophila pneumoniae*[7].

Few studies describe the bacteriological profile of patients admitted to pulmonary wards, considering the most prevalent diseases in these specific sectors. Also, many of these studies focus on patients with CAP[8-12]. The most comprehensive study on the bacteriological profile of lower respiratory tract diseases was conducted in Egypt, evaluating 360 patients with CAP, 318 with hospital-acquired pneumonia, and 376 with acute exacerbations of COPD.

While no studies have been published on the prevalence of underlying lung diseases among patients admitted to the pulmonology ward of tertiary hospital reference in lung disease in Pernambuco, hospitalizations due to exacerbations of COPD and bronchiectasis due to pulmonary sequelae of previous infections, mainly pulmonary tuberculosis, seem to predominate. The number of patients with CAP is lower in comparison to other etiologies. To date, no studies have examined the bacteriological profile in patients admitted to this ward. Therefore, this study aimed to identify the bacteriological profile of sputum cultures and bronchoalveolar lavage (BAL) in patients admitted to the pulmonology ward of a tertiary hospital reference in lung diseases and to evaluate the underlying lung diseases in these patients.

METHODS

A retrospective case series study was conducted in the pulmonology ward of a tertiary hospital reference in lung diseases in the state of Pernambuco, Brazil. The results of the sputum and BAL cultures of the patients were analyzed.

The inclusion criteria comprised patients with available results of sputum and BAL culture, or both, and complete medical records. Patients whose culture results were available but whose medical records were inaccessible, or incomplete, were excluded.

The study was conducted in four stages. In the first, results of sputum and BAL culture were retrieved from the bacteriology laboratory. Next, the electronic medical records of the patients identified in the first stage were retrieved. For those whose electronic records could not be located, printed medical records were requested in the third stage. Finally, in the fourth stage, data on age, underlying pulmonary disease, and comorbidities were collected based on the information obtained in the previous stages.

A standardized form was created for each bacteriological result and its corresponding patient, including the variables of interest: underlying pulmonary disease, comorbidities, number of hospitalizations, results of sputum, and BAL culture for nonspecific bacteria and fungi.

Descriptive analysis was performed using absolute and relative frequencies for qualitative variables. The measure of association used was the odds ratio (OR), with a 95% confidence interval (CI).

For quantitative variables, the mean and standard deviation were calculated, and Student's *t*-test was applied. The software Epi Info version 7 was used for analysis.

RESULTS

A total of 110 cultures, including sputum and BAL, were performed in 73 patients in the pulmonology ward. Of these, two were excluded due to the unavailability of electronic or printed medical records and one due to a mismatch between the name and the information provided by the microbiology laboratory. Therefore, 70 patients were included in the final analysis, of whom 58 were men (83%). The mean age was 54.8 ± 13.6 years, ranging from 18 to 87 years. Most patients (80%) had only one underlying pulmonary disease, with bronchiectasis secondary to tuberculosis sequelae being the most frequent (47%), followed by COPD (11%). Regarding comorbidities, 41% of patients had one comorbidity, while 39% had two or more.

Of sputum cultures, 69% were positive for pathogenic bacteria and 20% for fungi. BAL culture was performed in 23 patients (33%), with nonspecific bacterial growth in 21 samples (30%) and fungal growth in 3 samples (4%).

The most frequently isolated bacteria in sputum cultures belonged to the genera *Pseudomonas* (24%) and *Klebsiella* (21%) (Table 1). Within the *Pseudomonas* genus, the predominant species was *Pseudomonas aeruginosa*, while *Klebsiella pneumoniae ssp. pneumoniae* was the main species within the *Klebsiella* genus. All fungal isolates from sputum cultures were identified as *Candida albicans*.

In BAL cultures, due to the smaller number of samples, no predominant nonspecific bacteria were identified. *P. aeruginosa* and *Klebsiella* sp. were each isolated in four patients. Among the three BAL cultures positive for fungi, two isolates were *C. albicans*, and one was *Candida dubliniensis*.

Among patients whose sputum cultures were positive for *Pseudomonas* sp., 14 (82%) were male, with a mean age of 53.3 ± 16.5 years. Fourteen patients (82%) had one underling pulmonary disease, and three (18%) had two or more.

The *Pseudomonas* genus was significantly more frequent in patients with bronchiectasis (36%) ($p < 0.05$). No significant associations were observed between the presence of *Pseudomonas* sp. and the other variables analyzed (Table 2).

Table 1. Clinical parameters in patients hospitalized in the pneumology ward who underwent sputum or BAL culture.

Variables	n (%)
Age (years)	**54.8± 13.6**
Sex	
Male	58 (83)
Female	12 (17)
Number of PD[1]	
1	56 (80)
≥ 2	14 (20)
PD	
Abscess	07 (10)
Bronchiectasis	33 (47)
COPD	11 (16)
Neoplasia	10 (14)
Pneumonia	04 (6)
Active pulmonary tuberculosis	02 (3)
Others	15 (21)
Comorbidities	
0	12 (17)
1	29 (41)
2	27 (39)
3	02 (3)
Sputum (pyogenic)	
Positive	48 (69)
Negative	22 (31)
Sputum (fungi)	
Positive	14 (20)
Negative	56 (80)
BAL (pyogenic)	
Positive	21 (30)
Negative	02 (3)
Unrealized	47 (67)
LBA (fungi)	
Positive	03 (4)
Negative	20 (29)
Unrealized	47 (67)
Positive sputum	
Pseudomonas sp.	17 (24)
Klebsiella sp.	15 (21)

* Mean± standard deviation
1 DPB = underlying lung disease
PD = pulmonary disease
COPD = chronic obstructive pulmonary disease

Table 2. Clinical parameters in patients admitted to the pulmonology ward with positive sputum culture for the genus *Pseudomonas sp.*

Variables	*Pseudomonas sp.* Positive n (%)	Negative n (%)
Age (years)*	53.3 ±16.5	55.3 ±12.7
Sex		
Male	14 (24)	44 (76)
Female	03 (25)	09 (75)
Number of PD[1]		
1	14 (25)	42 (75)
≥ 2	03 (21)	11 (79)
PD[1]		
Abscess	01 (14)	06 (86)
Bronchiectasis		
Yes	12 (36)	21 (64)[a]
No	05 (14)	32 (86)
COPD	03 (27)	08 (73)
Neoplasia	01 (10)	09 (90)
Pneumonia	01 (25)	03 (75)
Others	01 (7)	14 (93)
Number of comorbidities		
0	03 (25)	09 (75)
1	07 (24)	22 (76)
2	07 (26)	20 (74)
3	0 (0)	02 (100)
Comorbidities		
Alcoholism	05 (28)	13 (72)
Diabetes mellitus	03 (30)	07 (70)
HIV2 / AIDS	0 (0)	03 (100)
Smoking	07 (19)	30 (81)

* Mean ± standard deviation
PD = pulmonary disease
1 COPD = chronic obstructive pulmonary disease
2 HIV = human immunodeficiency virus
3 AIDS = acquired immunodeficiency syndrome
*p-value < 0.05

Table 3. Clinical parameters in patients hospitalized in the pneumology ward with sputum culture positive for the genus *Klebsiella sp.*

Variables	*Klebsiella sp.* Positive n (%)	Negative n (%)
Age (years)*	51.8 ± 16.1	55.7 ± 12.9
Sex		
Male	14 (24)	44 (76)
Female	01 (8)	11 (92)
Number of PD [1]		
1	11 (20)	45 (80)
2		
PD[1]	04 (29)	10 (71)
Abscess	03 (43)	04 (57)
Bronchiectasis	05 (15)	28 (85)
COPD	03 (27)	08 (73)
Neoplasia	03 (30)	07 (70)
Pneumonia	0 (0)	04 (100)
Others	04 (27)	11 (73)
Number of comorbidities		
0	06 (50)	06 (50)
1	01 (3)	28 (9 7)
2	08 (30)	19 (70)
3	0 (0)	02 (100)
Comorbidities		
Alcoholism	04 (22)	14 (78)
Diabetes mellitus	0 (0)	10 (100)
HIV2 / AIDS	01 (33)	02 (67)
Smoking	09 (24)	28 (76)

* Mean ± standard deviation
PD = pulmonary disease
1 COPD = chronic obstructive pulmonary disease
2 HIV = human immunodeficiency virus
3 AIDS = acquired immunodeficiency syndrome

Table 4. Clinical parameters in patients admitted to the pneumology ward with sputum culture positive for fungi.

Variables	Fungi	
	Positive	Negative
	n (%)	n (%)
Age (years)*	52.0± 9.7	55.5 ± 144
Sex		
Male	14 (24)	44 (76)
Female	0 (0)	12 (100)
N º de PD1		
1	10 (18)	46 (82)
≥ 2	04 (29)	10 (71)
PD¹		
Abscess	02 (29)	05 (71)
Bronchiectasis	07 (21)	26 (79)
COPD	02 (18)	09 (82)
Neoplasia	03 (30)	07 (70)
Pneumonia	01 (25)	03 (75)
Others	01 (7)	14 (93)
Number of comorbidities		
0	03 (25)	09 (75)
1	05 (17)	24 (83)
2	06 (22)	21 (78)
3	0 (0)	02 (100)
Comorbidities		
Alcoholism	04 (22)	14 (78)
Diabetes mellitus	0 (0)	10 (100)
HIV2 /SIDA3	0 (0)	03 (100)
Smoking	08 (22)	29 (78)

* Mean ± standard deviation
PD = pulmonary disease
'COPD = chronic obstructive pulmonary disease
2 HIV = human immunodeficiency virus
3AIDS = acquired immunodeficiency syndrome
p-value < 0.05

Among the patients with sputum cultures positive for *Klebsiella sp.*, 14 (93%) were male, with a mean age of 51.8 ± 16.1 years (Table 3). No statistically significant differences were observed in the analyzed variables in relation to the presence of *Klebsiella sp*.

All cases of positive sputum cultures for fungi occurred in male patients (100%), with a mean age of 52 ± 9.7 years. However, no significant differences were identified between the groups with and without positive fungi cultures (Table 4).

DISCUSSION

This case series revealed two main findings. First, the most prevalent bacterial genera were *Pseudomonas sp.* and *Klebsiella sp* respectively. Second, the most common underlying pulmonary disease was bronchiectasis resulting from pulmonary tuberculosis sequelae.

Within the *Pseudomonas* genus, *P. aeruginosa* was the predominant species, especially in patients with bronchiectasis. This observation aligns with previous studies involving patients with bronchiectasis, in which *P. aeruginosa* was found in approximately one-third of cases. Also, *Haemophilus influenzae* is a frequently reported pathogen in patients with bronchiectasis, according to other studies. However, in the microbiology laboratory where the present study was conducted, *H. influenzae* was not considered pathogenic and was not included in the data, limiting comparative analysis.

Klebsiella sp., the second most frequently isolated genus, is a nosocomial pathogen capable of causing pulmonary infections, particularly hospital-acquired pneumonia. Also, it is associated with other respiratory conditions, such as lung abscesses, and is more common in immunocompromised individuals, including those with diabetes mellitus and malignancies. Nevertheless, in this study, no statistically significant association was observed between the presence of *Klebsiella* sp. and any specific underlying pulmonary disease or comorbidities.

Regarding the fungal profile, all positive cultures involved *Candida* species, primarily *C. albicans*, except for one instance of *C. dubliniensis*. Airway colonization or contamination of respiratory secretions with *Candida* from the oropharynx is a frequent finding. Moreover, previous studies have demonstrated that the growth of *Candida* species in respiratory specimens, including BAL, has limited predictive value for diagnosing lower respiratory tract infections. In fact, fungal diseases of the lungs, such as pneumonia or abscesses caused by *Candida*, are rare and typically occur through hematogenous dissemination rather than through aspiration of contaminated secretions.

The second notable finding of this study was the high prevalence (47%) of bronchiectasis among hospitalized patients. While previous studies in the United Kingdom and Spain reported that the most frequent etiology of bronchiectasis is post-infectious, often originating in childhood and more commonly affecting women, the present study diverged in two aspects. First, bronchiectasis was more com-

mon among men, and second, its etiology was predominantly linked to sequelae of *Mycobacterium tuberculosis* infection rather than childhood infections. Except for three patients whose bronchiectasis had undefined causes, all others presented traction bronchiectasis as a post-tuberculosis complication. Consistent with this, pulmonary tuberculosis is a serious public health problem in Brazil, considered one of the 22 countries responsible for 80% of all cases in the world. Pernambuco is one of the Brazilian states with the highest incidence and the second highest mortality rate. Thus, many patients develop lasting pulmonary structural damage, including bronchiectasis.

The second most frequent disease reported was COPD (16%), often in combination with other respiratory diseases. In these cases, no predominant microorganism was identified, diverging from other studies.

CAP affected 6% of patients in this study, in contrast to other studies where *Streptococcus pneumoniae* was the primary bacteria in these patients . The current study found *Pseudomonas aeruginosa* in two of the four patients with CAP, and no microbial growth was observed in the remaining two. These findings are inconsistent with prior research that has frequently associated CAP with *S. pneumoniae* and atypical pathogens in patients outside the intensive unit care.

Furthermore, the bacteriology laboratory does not consider common flora bacteria as pathogenic, even when the growth is predominant, not being possible to properly evaluate the most involved bacteria. Furthermore, the laboratory does not perform serological testing for atypical pathogens such as *Mycoplasma pneumoniae*, a method used in other studies to characterize the bacteriological profile of CAP. Additional limitations include the lack of blood cultures and urinary antigen testing. The retrospective design, based on the review of medical records, also represents an inherent limitation. Finally, it is worth mentioning that cultures were analyzed qualitatively since colony counts were not reported.

CONCLUSION

This retrospective study evaluated the bacteriological profile of lower respiratory tract infections in hospitalized patients. *Pseudomonas aeruginosa* was the most frequent bacteria, particularly among patients with bronchiectasis, a condition predominant in adult men.

Klebsiella sp. was the second most prevalent bacterium, corroborating with other studies, although no significant association was found with any specific pulmonary disease or comorbidity.

Among the underlying pulmonary diseases, tuberculosis emerged as a significant public health concern in Brazil. Pernambuco, specifically, presents one of the highest incidence rates and the second-highest mortality rate. COPD was the second most frequent disease, with no clear association with any predominant microorganism.

Thus, knowing the bacteriological profile of the various health services, such as the pneumology ward, facilitates developing more directed empirical therapies. Consequently, this approach may contribute to reducing therapeutic failures and shortening hospital stays, ultimately improving patient outcomes.

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REVIEW ARTICLE

INCREASED MAGNESIUM INTAKE IN THE DIET ASSOCIATED WITH CHRONIC PAIN REDUCTION: A SYSTEMATIC REVIEW

AUMENTO DA INGESTA DE MAGNÉSIO NA DIETA ASSOCIADA À REDUÇÃO DA DOR CRÔNICA: UMA REVISÃO SISTEMÁTICA

Sérgio Manoel Lemos de Carvalho[1/*], Gabriella Caroline de Carvalho Gomes[1], Ana Roberta de Vasconcelos Mororó Wanderley[1], Lívia Dhayany Alexandre da Costa Lima[1], Joyce Ferreira Gomes de Oliveira[2], Raphaella Amanda Maria Leite Fernandes[3]

[1] Student at the Faculdade de Medicina de Olinda (FMO) and members of the Liga Acadêmica de Clínica Médica Aplicada (LACMA), [2] Student at the Universidade de Pernambuco (UPE), [3] Academic coordinator at the FMO and counselor at the LACMA.

ABSTRACT

Objectives: To perform a systematic review that addressed the association between increased intake in the diet of magnesium (Mg) and chronic pain reduction. **Methods:** A systematic review was developed from August to September 2018 using PubMed, BIREME, and LILACS databases through DeCS/MeSH descriptors; studies in English, Portuguese, and Spanish languages addressing the Mg intake in the diet of individuals with chronic pain were included. **Results:** Of the total studies selected, three met the inclusion criteria; of these, one was not significant ($p > 0.05$). In women with fibromyalgia aged between 18 and 60 years, Mg and calcium intake were positively correlated with the pain threshold ($r = 0.25$, $p = 0.01$ and $r = 0.32$, $p = 0.01$, respectively) and negatively correlated with tender points ($r = -0.23$, $p = 0.02$ and $r = -0.28$, $p = 0.03$, respectively). The intensity of migraine pain was significantly reduced in the supplementation group (Mg, riboflavin, and coenzyme Q10) compared with the placebo group ($p = 0.03$). Of the 90 women with rheumatoid arthritis, the nutrient intake and disease activity scores were not significantly correlated. **Conclusion:** The increased Mg intake was correlated with chronic pain reduction, reinforcing the relevance of nutritional care to improve the quality of life.

Keywords: Chronic pain; Diet; Magnesium.

RESUMO

Objetivos: Realização de uma revisão sistemática que aborda a associação entre o aumento da ingesta de magnésio, através da dieta, com a redução da dor crônica. **Métodos:** Foi desenvolvida uma revisão sistemática a partir das bases de dados, PubMed, BIREME e LILACS, via descritores DeCS/MeSH; incluindo estudos que abordassem a temática da ingesta de magnésio na dieta de indivíduos com dor crônica. Utilizando os idiomas inglês, português e espanhol. O levantamento bibliográfico foi realizado no período entre agosto e setembro de 2018. **Resultados:** Do total de artigos selecionados, 3 atenderam aos critérios de inclusão, sendo que em 1 não houve significância ($p>0,05$). Em mulheres com fibromialgia (FM), entre 18-60 anos, a ingestão de magnésio e cálcio apresentou correlação positiva com o limiar da dor ($r=0,25$; $p=0,01$ e $r=0,32$; $p=0,01$, respectivamente) e correlação negativa com os TP ($r=-0,23$; $p=0,02$ e $r=-0,28$; $p=0,03$, respectivamente). A intensidade da enxaqueca foi significativamente reduzida no grupo de suplementação (magnésio, riboflavina e coezima Q10), comparado ao placebo ($p = 0,03$). Nas 90 mulheres com artrite reumatoide (AR), não houve significativa relação entre a ingestão de nutrientes e escore de atividade da doença. **Conclusão:** Definiu-se que há uma correlação no aumento da ingesta de magnésio com a redução da dor crônica, reforçando a relevância do cuidado nutricional para melhora da qualidade de vida.

Palavras-chave: Dor crônica. Dieta. Magnésio.

INTRODUCTION

Chronic pain is associated with certain chronic pathogenic processes, ranging from months to years; pain is the primary complaint in many cases, impairing the quality of life of individuals[1]. Some authors report that patients with chronic pain often exhibit inadequate intake of vitamins and minerals[2].

Recent studies have emphasized the importance of including magnesium (Mg) supplementation in improving the quality of life of individuals with chronic pain. As the second most abundant intracellular ion, Mg plays a key role in ATP synthesis and is involved in numerous metabolic functions, participating in the activity of over 300 enzymes[3,4].

In this context, Mg is also important in cell membrane permeability, electrical activity, bone mineralization, muscle relaxation, and neurotransmission. Its deficiency reduces energy levels, promoting excessive muscle tension that causes spasms and contributes to muscle fatigue[5].

Mg deficiency has been associated with several conditions, including headache disorders, migraines, fibromyalgia (FM), as well as metabolic and cardiovascular alterations[5].

For individuals with chronic pain, Mg supplementation is being discussed to establish stronger evidence of its efficacy. However, consistent data remains scarce in the literature. Therefore, this systematic review aimed to examine the association between increased dietary Mg intake and chronic pain reduction.

METHODS

As part of the systematic review research strategy, the search was conducted using the following databases: Latin American and Caribbean Health Sciences Literature (LILACS), US National Library of Medicine/National Institutes of Health (PubMed), and Virtual Health Library (VHL-BIREME) using the Descriptors in Health Sciences (DeCS) and Medical Subject Headings (MeSH) terms. The search was conducted between August and September 2018.

The descriptors used were chronic pain, diet, and magnesium. The inclusion criteria comprised studies examining dietary Mg intake in individuals with chronic pain published in English, Portuguese, and Spanish languages. Only those involving individuals aged 20 years or older were considered. Exclusion criteria included studies that evaluated the efficacy of Mg administered intravenously or that focused on conditions other than chronic pain.

For data analysis, the studies across different databases were selected in three stages. In the first stage, titles of the studies identified by the combination of descriptors were screened, and those that did not meet the inclusion criteria or were deemed ambiguous were excluded. In the second stage, abstracts of the remaining studies were reviewed, and those not aligned with the inclusion criteria were excluded. In the third stage, the full texts of the remaining studies were read to determine their inclusion in this review.

In the PubMed database, 11 articles were retrieved. Of these, seven were excluded based on their titles. The abstracts of the remaining four studies were reviewed, and two were excluded, leaving two eligible abstracts. In the BIREME database, three studies were initially identified, with one excluded after title screening. The remaining two abstracts were examined, and only one was included for full-text review. No relevant studies were found in the LILACS database after descriptor cross-referencing.

RESULTS

Table 1 presents the main information from the three included studies. Andretta (2015)[5] analyzed serum levels of Mg and calcium (Ca) in women with FM aged from 18 to 60 years. The study was conducted in two phases and included anthropometric assessment via body mass index, physical examination to determine pain perception threshold and count of tender points (TP), blood collection to measure Mg, Ca, and C-reactive protein (CRP), completion of the Fibromyalgia Impact Questionnaire and the Patient Health Questionnaire-9, and submission dietary record from the last three days. In the FM group, dietary intake of Mg and Ca were positively correlated with pain threshold ($r = 0.25$, $p = 0.01$ and $r = 0.32$, $p = 0.01$, respectively) and negatively correlated with the number of TP ($r = –0.23$, $p = 0.02$ and $r = –0.28$, $p = 0.03$, respectively). CRP levels were inversely correlated with serum Mg ($r = –0.29$, $p = 0.03$). The study concluded that women with FM consumed less Mg and Ca than the control group, indicating a direct relationship between their intake and the pain threshold. Additionally, Mg and Ca intake and the number of TP were inversely correlated[5].

In another study, Hejazi et al. (2011)[6] studied

90 women with rheumatoid arthritis (RA), randomly selected from 200 individuals. Using questionnaires, they provided information about their diets and underwent a clinical examination by a rheumatologist. A Disease Activity Score (DAS-28) was calculated, which included the number of tender and swollen joints, a visual analogue scale, and CRP serological testing. The study found that the individuals consumed lower than recommended amounts of several micronutrients, including Mg. However, no significant association was observed between the intake of various nutrients or food groups and DAS-28, malondialdehyde levels, total antioxidant capacity, or CRP values ($p > 0.05$)[6].

Gaul et al. (2015)[7], in a multicenter, randomized, double-blind, placebo-controlled study, evaluated the use of Mg combined with riboflavin and coenzyme Q10 to assess potential reductions in migraine incidence (frequency and intensity) and their impact on pain. The number of migraine days per month decreased from 6.2 days during the baseline period to 4.4 days in the supplementation group and from 6.2 to 5.2 days in the placebo group ($p = 0.23$ compared with placebo). Migraine pain intensity was significantly reduced in the supplement group compared with the placebo group ($p = 0.03$). The total score on the Headache Impact Test (HIT-6) decreased by 4.8 points, from 61.9 to 57.1 in the supplementation group, compared with a 2-point reduction in the placebo group ($p = 0.01$). Patient-reported efficacy ratings were also significantly higher in the supplementation group than in the placebo group ($p = 0.01$). Although no significant difference was observed in the reduction of migraine days between groups, the supplement group showed statistically significant improvements in pain intensity and migraine-related life impact compared with the placebo group[7].

Table 1. Selected studies, their respective objectives, and results.

Author/year	Sample size	Assessment of the procedure studied	P-value of the study	Individualized p-value	
Gaul *et al.* (2015)[7]	130	Improvement in migraine with supplementation (Mg, CoQ10, and riboflavin)	P = 0.01	Intensity	P = 0.03
				Nº of days	P = 0.23
				Effectiveness	P = 0.01
Andretta (2015)[5]	103	Relationship between serum levels of Mg and Ca in women with FM	P = 0.01	Mg	
Hejazi *et al.* (2011)[6]	90	Nutritional relationship with RA	P > 0.05	No statistical significance observed	

DISCUSSION

Based on the results, few studies addressed the relationship between Mg intake and chronic pain reduction. The included studies exhibited considerable heterogeneity, complicating direct comparisons due to divergent variables. Nevertheless, with one exception, these studies demonstrated that increased dietary Mg intake led to statistically significant reductions in chronic pain in individuals.

FM, a rheumatic disorder characterized by widespread chronic pain and multiple symptoms, such as fatigue and headache, appears to have Mg as an important factor in its pathogenesis, making it potentially effective in managing chronic pain[8]. Andretta (2015)[5] observed that Mg and Ca intake was significantly lower in women with FM than control individuals ($p = 0.03$ and $p = 0.003$, respectively). No significant differences were found in serum levels of Mg and Ca between groups. In the FM group, dietary intake of Mg and Ca showed an inverse correlation with the number of TP ($r = -0.23$, $p = 0.02$ and $r = -0.28$, $p = 0.03$, respectively) and a direct correlation with pain threshold ($r = 0.25$, $p = 0.01$ and $r = 0.32$, $p = 0.01$, respectively). CRP levels were inversely correlated with serum Mg levels ($r = -0.29$, $p = 0.03$)[5].

Hejazi et al. (2011)[6] demonstrated that the consumption of micronutrients, particularly Mg, among individuals was substantially below the recommended levels. These results are consistent with those of Andretta (2015)[5], who reported a reduced dietary intake of Mg among women with FM, sug-

gesting that individuals with chronic pain, including FM and RA, may exhibit decreased Mg levels in their diets. However, Hejazi *et al.* (2011)[6] found no significant associations ($p > 0.05$) between the intake of various nutrients or food groups, DAS-28, and biochemical markers, including malondialdehyde, CRP, and total antioxidant levels.

Gaul et al. (2015)[7] demonstrated that the treatment reduced the number of migraine days from 6.2 days at baseline to 4.4 days after three months of treatment, representing a reduction of 1.8 days. However, this reduction was not statistically significant compared with the placebo group ($p = 0.23$). Nevertheless, migraine intensity significantly reduced after three months of treatment compared with the placebo group ($p = 0.03$). The percentage of individuals reporting severe pain was lower, and the percentage reporting mild pain was higher at the end of the treatment phase in the active group than in the placebo group. The HIT-6 score in the active group decreased significantly by 4.8 points ($p = 0.01$). Patient-reported treatment efficacy was also statistically superior to the placebo group ($p = 0.01$) after three months. The incidence of adverse effects was higher in the active group (23.8%) than in the placebo group (4.8%), with gastrointestinal disorders being the most common in the active (17.7%) and placebo (3.2%) groups. Although the supplementation did not significantly reduce the number of migraine days, the combination of Mg, riboflavin, and coenzyme Q10 effectively reduced migraine intensity and the overall impact of pain in individuals from the active group[7]. A limitation of this systematic review is that the included studies did not isolate the influence of dietary Mg intake in individuals with chronic pain. Rather, they evaluated Mg consumption combined with other micronutrients. Therefore, future studies must be conducted to specifically evaluate the impact of increased dietary Mg intake in individuals with chronic pain, with or without correlation to improvements in pain symptoms.

CONCLUSION

The analysis established a correlation between increased Mg intake and chronic pain reduction, reinforcing the importance of nutritional care in improving quality of life.

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REVIEW ARTICLE

CORRELATION OF FRACTION OF INSPIRED OXYGEN IN THE INTRAOPERATIVE AND IMMEDIATE POSTOPERATIVE PERIODS WITH THE LOWEST INCIDENCE OF SURGICAL SITE INFECTION: A SYSTEMATIC REVIEW OF THE LITERATURE

CORRELAÇÃO DA FRAÇÃO INSPIRADA DE OXIGÊNIO NO INTRAOPERATÓRIO E PÓS-OPERATÓRIO IMEDIATO COM A MENOR INCIDÊNCIA DE INFECÇÃO DO SÍTIO CIRÚRGICO: UMA REVISÃO SISTEMÁTICA DA LITERATURA

Ana Roberta de Vasconcelos Mororó Wanderley[1/*], Sérgio Manoel Lemos de Carvalho[1], Rafael Bueno de Andrade[1],Gabriella Caroline de Carvalho Gomes[1], Raphaella Amanda Maria Leite Fernandes[2]

[1] Medical Student at FMO and member of LACMA, [2] Academic Coordinator at FMO and supervisor of LACMA

ABSTRACT

Objectives: Identify the optimal fraction of inspired oxygen (FiO_2)administered in the intraoperative and postoperative periods to reduce the incidence of surgical site infection (SSI). **Methods:** A systematic review was performed in LILACS, PUBMED, and SCIELO databases to answer the guiding question: correlation of FiO_2 in the intraoperative and immediate postoperative periods with the lowest incidence of SSI. **Results:** Three of the six studies included did not prove a relevant improvement in SSI after use of high FiO_2. However, three studies showed a lower incidence of SSI in patients who received high FiO_2 in the intraoperative and postoperative periods. **Conclusion:** A high FiO_2 administered in the intraoperative and postoperative periods was positively correlated with a lower incidence of SSI. However, further research is needed considering the limited number of studies available, the heterogeneity of study populations, and the variety of surgical procedures.

Keywords: Oxygen therapy; Surgical site infection; Intraoperative; FiO_2; Postoperative

RESUMO

Objetivos: Identificar nos artigos revisados a FiO2 no intraoperatório e pós-operatório ideal para reduzir a incidência de ISC. **Métodos:** Desenvolveu-se uma revisão sistemática da literatura, com busca nas bases de dados: LILACS, PUBMED e SCIELO para responder a seguinte questão norteadora: Correlação da FiO2 no intraoperatório e pós-operatório imediato com a menor incidência de ISC. **Resultados:** Na avaliação dos 6 artigos estudados, 3 não comprovaram relevante melhoria na ISC após a utilização de altas FiO2. Porém, 3 estudos evidenciaram menor incidência desta infecção nos pacientes que receberam altas concentração de oxigênio suplementar no intraoperatório e pós-operatório. **Conclusão:** Existe correlação entre o aumento da FiO2 no intraoperatório e pós-operatório com a menor incidência de ISC. Entretanto, diante da pequena quantidade de estudos disponíveis na literatura, da heterogeneidade das populações e dos procedimentos cirúrgicos conclui-se que são necessárias mais pesquisa.

Palavras-chave: Oxigenoterapia; Infecção de sítio cirúrgico; Intraoperatório; Fração inspirada de oxigênio; Pós-operatório

INTRODUCTION

Surgical site infection (SSI) is caused by surgical incisions or tissue spaces penetrated during or after surgery. This complication may be caused by several factors, increasing hospital length of stay and treatment costs[1,2]. SSI is the most prevalent among those related to health care and can be prevented. In addition, 14% to 16% of these infections occur in hospitalized patients[3].

The administration of high oxygen levels in the perioperative and postoperative periods is associated with a decreased incidence of SSI. Oxygen is a protective factor against pathogens due to the oxidative destruction caused by neutrophils in a mechanism dependent on the partial pressure of tissue oxygen[1].

In 2016, the World Health Organization recommended that all intubated patients receive an oxygen concentration of 80% of the fraction of inspired oxygen (FiO2) during surgery and the first six hours of the immediate postoperative period. This recommendation sparked debate, and some studies have suggested that a high FiO2 concentration may increase the risk of adverse effects[4].

The FiO_2 set at 80% may cause atelectasis, systemic vasoconstriction, pulmonary inflammation. Additionally, free radicals generated by oxygen may oxidize proteins, DNA, or lipids, resulting in cellular oxidative stress[4].

Thus, the optimal FiO_2 in the intraoperative and immediate postoperative period to prevent SSI without increasing the adverse effects remains under debate. Additionally, few studies on this topic investigated the prevention of surgical complications. This systematic review aimed to identify the optimal intraoperative and postoperative FiO2 levels to minimize surgical site complications without harming the patient.

METHODS

This systematic review was performed using Latin American and Caribbean Literature in Health Sciences (LILACS), US National Library of Medicine/National Institute of Health (PubMed), and Scientific Electronic Library Online (SciELO) databases to answer the guiding question: correlation of FiO_2 in the intraoperative and immediate postoperative periods with the lowest incidence of SSI.

The study adopted the following inclusion criteria: (a) articles, dissertations, or theses; (b) free available and full text (original, review, experience report, update, or case study); (c) studies that addressed specific mathematics on FiO_2 with the lowest incidence of SSI; (d) published between 2007 and 2018; and (e) studies available in Portuguese, English, or Spanish. The exclusion criteria encompassed (a) texts that did not answer the guiding question of the research, and (b) duplicates in more than one database[5]. The search terms "oxygen therapy", "surgical site infection", "intraoperative", "FiO_2", and "postoperative" were used in combination using the Boolean operator AND.

The research was performed by three researchers who independently selected and screened eligible studies. In PubMed, the search terms "oxygen therapy", "surgical site infection", and "intraoperative" were used; 11 studies were found, and after reading, 1 was suitable for the review. Using the keywords "oxygen therapy", "surgical site infection", and "postoperative", 27 studies were found, and 4 were suitable for the study. In LILACS, the search terms "FiO2" and "surgical site" were used; two studies were found, and one was suitable for the study. The search in SciELO did not return results for any of the search terms. The search in SciELO did not return results for any of the search terms.

RESULTS

Given the findings, one study is from 2007, two from 2013, one from 2014, one from 2015, one from 2016, and one from 2018.

Morkane et al. (2018) conducted a retrospective observational study with 378 patients from 29 hospitals with a mean age of 66. The FiO_2 used intraoperatively ranged from 25% to 100%. The results showed that postoperative complications may increase depending on the dose of hyperoxia, potentially increasing morbidity and mortality. Despite the limitations, an FiO_2 of 50% was recognized as the standard used by anesthesiologists in the United Kingdom[4].

Williams et al. (2013) conducted a randomized controlled study with 160 women. In this study, the correlation between SSI and cesarean sections was assessed based on FiO_2 (30% to 80%) during surgery and two hours after labor. Twenty-two cases of SSI were identified (13.8%). The following covariates were analyzed: ethnicity, marital status, body mass index, maternal parity, and operation

time. The infection rate was associated with three covariates (ethnicity, body mass index, and operation time). FiO_2 did not show any interdependence with the incidence of SSI[2].

Mejia J et al. (2007) performed a meta-analysis correlating SSI, admission to intensive care unit, mortality, hospital length of stay, first oral food intake in the postoperative period, and time to suture removal. This study found no correlation between FiO_2 and the reduction of SSI in patients who underwent elective abdominal surgery[1].

Schietroma et al. (2016) conducted a prospective randomized study with 81 patients who underwent elective open infraperitoneal surgery for colorectal cancer. An oxygen or air mixture with an FiO_2 of 30% (n = 41) or 80% (n = 40) was administered to the patients and was maintained from the induction of anesthesia until six hours after surgery. Among the patients who received FiO_2 of 30%, 11 (26.8%) had a wound infection, compared with 6 (15%) who received 80%. Thus, FiO_2 80% decreased the risk of SSI by 41% compared with FiO_2 30%, a factor related to the lower incidence of SSI. In addition, the increased FiO_2 reduced the hospital length of stay and the probability of mortality[6].

Schietroma et al. (2014) conducted a prospective randomized study that correlated FiO_2 perioperative with SSI after surgery for acute sigmoid diverticulitis. They evaluated 85 patients perioperatively; 43 received FiO_2 at 30% and 42 received FiO_2 at 80%. The mean duration of surgery was 195 and 200 minutes for patients who received FiO_2 30% and 80%, respectively. Of the total, 14 patients who received FiO_2 at 30% had SSI, compared with 7 who received FiO_2 at 80%. Thus, the incidence of SSI was lower in patients who received FiO_2 at 80% than in those who received FiO_2 at 30% ($p < 0.05$). The risk of SSI was 43% lower in the group receiving FiO_2 80% (relative risk of 0.68 with 95% confidence interval [0.35 to 0.88])[7].

Stall et al. (2013) presented a study on oxygen supplementation regarding SSI after open bone fracture fixation. This study evaluated 217 patients, in which one group received FiO_2 at 80% and another FiO_2 at 30% throughout the intraoperative period until two hours postoperatively. The incidence of SSI was 12% in the group that received FiO_2 80% and 16% ($p = 0.31$) in the FiO_2 30% group. High FiO_2 levels showed a correlation with reduced SSI in patients undergoing bone fracture correction surgery.[8]

Table 1. Characteristics of patients in the literature

Author Year	Sample size	Evaluation of the Studied Procedure	p Value	Conclusion
Morkane *et al.* 2018	378	Intraoperative oxygenation in adult patients undergoing surgery (IOPS): a retrospective observational study across 29 United Kingdom hospitals	0.001	A FiO_2 50% currently represents standard intraoperative practice in the United Kingdom
Williams *et al.* 2013	339	Randomized controlled trial of the effect of 30% versus 80% fraction of inspired oxygen on cesarean section surgical site infection	0.82	FiO_2 did not show any interdependence with the incidence of SSI
Donado *et al* . 2007	989	Supplemental oxygen and perioperative surgical site infection: meta-analysis of controlled clinical trials	0.58	High FiO_2 in the management of elective abdominal surgery patients does not reduce SSI
Schietroma *et al.* 2016	85	High-concentration supplemental perioperative oxygen and surgical site infection following elective colorectal surgery for rectal cancer: a prospective, randomized, double-blind, controlled, single-site trial	< 0.05	FiO_2 of 80% during and after open surgery for acute sigmoid diverticulitis reduces postoperative SSI

DISCUSSION

SSI is a serious surgical complication, as it increases the hospital length of stay. Improving perioperative conditions in the first hours of bacterial contamination is essential to prevent SSI. In this period, tissue oxygen is usually low, which reduces the response to oxidative recovery of neutrophils and decreases collagen formation, neovascularization, and epithelialization. Therefore, a high FiO_2 may reduce the incidence of SSI[5].

The serious consequences imposed on patients who develop SSI require efforts to create strategies to prevent this infection. One strategy employed is the identification of risk factors, which enables the detection of situations or clinical conditions that predispose patients to SSI development. In this sense, identifying risk factors contributes to adopting interventions that aim to minimize complications[8].

Therefore, studies were analyzed to correlate the FiO_2 in the intraoperative and immediate postoperative periods with the lowest incidence of SSI. The results showed that few studies investigated the benefits and limitations of protecting the FiO_2 in preventing SSI. Also, the included studies presented heterogeneity in the study populations, different diseases, and surgical procedures.

The results suggest a lack of studies that conclude a correlation between FiO2 and lower SSI incidence. The literature is heterogeneous, thus presenting different variables that hinder comparisons. However, three of the six studies evaluated did not prove a relevant improvement in SSI after high use of FiO_2.

The retrospective and observational study by Morkane et al. (2018) found that administering FiO2 at 80% perioperatively and postoperatively did not achieve a significant change in the prevention of SSI compared with the standard fraction of FiO2 at 30%[4]. This finding corroborates with the Williams et al. (2013), a randomized clinical trial that concluded no difference in the incidence of SSI in FiO_2 80% and 30%[2].

In contrast, Schietroma et al. (2014) demonstrated, in a prospective and randomized study, that an FiO2 of 80% reduced the incidence of SSI in the postoperative period of elective colorectal surgery for rectal cancer[6]. The same author (prospective and randomized study conducted in 2016) also concluded that SSI was reduced with FiO_2 at 80% in surgery for acute sigmoid diverticulitis[7]. Corroborating with Stall et al. (2013), which found that using high FiO_2 during the perioperative period was safe and tended to reduce SSI in surgeries to fix severe trauma in fractures of the lower extremities[8].

CONCLUSION

A positive correlation was found between the increased FiO_2 intraoperative and postoperative and a lower incidence of SSI. However, further research is needed, given the limited number of studies, the heterogeneity of the study populations, and the diverse surgical procedures.

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UNCONVENTIONAL FOOD PLANTS AS FUNCTIONAL FOOD: LITERATURE REVIEW

PLANTAS ALIMENTÍCIAS NÃO CONVENCIONAIS COMO ALIMENTO FUNCIONAL: UMA REVISÃO BIBLIOGRÁFICA

Paulo Roberto da Silva Júnior[1/+], Thayane Araújo Lima[1], Marcella Olímpia Quintino Silva[1], Israel de Lima França[2], Schirley Cristina Almeida Pereira[3], Thárcia Kiara Beserra de Oliveira[3]

[1] Undergraduate student in Medicine at Centro Universitário Unifacisa, [2] Undergraduate student in Medicine at Centro Universitário Tocantinense Presidente Antônio Carlos, [3] Faculty member at Faculdade de Medicina de Olinda; 4Faculty member at Faculdade de Medicina de Olinda and Centro Universitário Unifacisa. PhD from the Universidade Federal de Campina Grande

ABSTRACT

Introduction: Unconventional food plants (UFP), whether spontaneous, cultivated, native, or exotic, have one or more edible parts that are not included in our daily menu. **Objectives:** This study aimed to discuss UFP as a functional food for the population, disseminate knowledge of these species in food culture, and encourage their consumption. **Methods:** Data were summarized from 30 recent articles in Portuguese and English retrieved from databases (SciELO and PubMed) and books in the health field. **Results:** The UFP addressed in this study participates in several metabolic processes, including anti-inflammatory, antibacterial, wound-healing, antineoplastic, and antiscorbutic activities. Significant concentrations of calcium, iron, zinc, potassium, and magnesium were found in their compositions. The high protein and fiber content also facilitates gastrointestinal processes. **Conclusion:** UFP are still poorly known by the Brazilian population. In contrast, its composition, nutritional values, and safety in daily diet are already well known. Besides having a pleasant taste, they contain high concentrations of fiber, vitamins, and minerals, essential to maintain the body homeostasis.

Keywords: Food plants; Effects; Functional food

RESUMO

Introdução: As plantas alimentícias não convencionais (PANC) destacam-se como plantas que possuem uma ou mais partes comestíveis, sendo elas espontâneas ou cultivadas, nativas ou exóticas que não estão incluídas em nosso cardápio cotidiano. **Objetivo:** Este trabalho visa abordar as plantas alimentícias não convencionais como alimento funcional para a população, de forma a promover a disseminação do conhecimento dessas espécies na cultura alimentar e o incentivo ao seu consumo. **Métodos:** Foram sumarizados dados de 30 artigos recentes em português e inglês provenientes de bases de dados (SciELO e PubMed), cadernos de saúde e livros. **Resultados:** As PANC estudadas demonstraram atuar nos mais diversos processos metabólicos, apresentando atividades anti-inflamatórias, antibacterianas, cicatrizantes, antineoplásicas e antiescorbúticas. Além disso, constatou-se a presença de concentrações significativas de cálcio, ferro, zinco, potássio e magnésio em suas composições. Aliado a isso, tem-se o alto teor de proteínas e de fibras, servindo no auxílio de processos gastrointestinais. **Conclusão:** As plantas alimentícias não convencionais ainda são pouco conhecidas pela população brasileira. Suas composições e valores nutricionais já são bem conhecidos, bem como a segurança de seu emprego na alimentação diária. Além de sabor agradável, elas possuem altas concentrações de fibras, vitaminais e minerais, necessários na manutenção da homeostase corporal.

Palavras-chave: Plantas alimentícias; Efeitos; Alimento funcional

INTRODUCTION

Approximately 390,000 plant species are currently known worldwide.[1] However, despite the remarkable biodiversity, only about 300 species are actively used for human purposes (e.g., food production, pharmaceuticals, construction, and bioenergy).[2,3] Among these, only fifteen species account for 90% of the global food consumption, reflecting the underutilization of native species and the overreliance on exotic plants.[4]

This perspective is also observed in Brazil, which has vast biological wealth and significant agricultural potential; however, the native biodiversity remains insufficiently explored, particularly in terms of its use as food. Consequently, the Brazilian diet tends to be limited to a few staple food groups (e.g., rice, beans, and coffee) and some regionally consumed items, including cassava.[5]

Within this context, unconventional food plants (UFP) are defined as cultivated, wild, native, or exotic species that are edible in one or more parts. UFP represents viable alternatives for expanding the nutritional options available to the population and enhancing food security and autonomy.[3]

These plants typically develop in natural environments without the need for inputs or deforestation. As they are local, they are more resistant and do not require pesticides. However, despite their low cost and ecological benefits, a significant portion of the population remains unaware of these species, leading to underutilization.[3,6]

Therefore, this study aimed to explore UFP as a functional food source, promoting awareness and integration of these species into the local food culture and encouraging their consumption as part of a more sustainable and diverse diet.

METHODS

This exploratory and descriptive study summarized the recent literature available in English and Portuguese. A total of 30 scientific studies addressing UFP as a potential component of the human diet were selected from SciELO, PubMed, public health journals, and books, and analyzed.

The following keywords were used for the literature search: UFP, family farming, food security, *Rumex acetosa L.*, *Talinum paniculatum*, *Tropaeolum majus*, *Erechtites valerianifolius*, *Amaranthus viridis L.*, and *Pereskia aculeata Miller*.

DISCUSSION

The UFP is part of a group of edible species that grow in natural environments without the need for agricultural inputs or advanced cultivation techniques, making them particularly suitable for family farming. Furthermore, UFP contributes to promoting dietary diversification, which has been compromised by the increasing consumption of convenience and ultra-processed foods.[3,7]

Among the wide variety of UFP, six species were highlighted to discuss their nutritional value and culinary applications.

Azedinha

Commonly known as "*azedinha-da-horta*" in Brazil, *Rumex acetosa L.* is an herbaceous leafy vegetable from the Polygonaceae family, characterized by round green leaves and a texture similar to watercress.[8]

Although not widely known in urban centers, this vegetable is cultivated in household gardens of rural areas from the Southeast and South of Brazil and is very common in family gardens.[9] Its acidic flavor (hence the popular name) makes it suitable for use in salads and juices.

R. acetosa has a low lipid content and is rich in vitamins, dietary fibers, and essential minerals. It also contains a range of biological properties, including antioxidant, anti-inflammatory, antibacterial, wound-healing, antineoplastic, and antiscorbutic activities, and contributes to the immune system modulation. Its regular consumption may be associated with human health benefits.[7,10-12]

Beldroegão

Talinum paniculatum, an herbaceous plant from the Talinaceae family, is known in Brazil by various names (e.g., "*erva-gorda*", "*cariru*", or "*majorgomes*") and has a high nutritional potential due to the elevated protein content and significant levels of calcium, iron, zinc, potassium, and magnesium.[13]

Due to its compact size, it can be cultivated in small pots and shaded environments, yielding multiple harvests throughout the year.[13,14]

Capuchinha

Known as "*capuchinha*" in Portuguese, the *Tropaeolum majus* is a small herbaceous plant suitable for cultivation in moist and shaded areas.[14] The leaves, flowers, fruits, and stems are edible and can

be used raw in the preparation of salads. The mature seeds, which have a pungent flavor, are also used in cooking. The plant is rich in iodine, iron, potassium, and vitamin C.[1,15,16]

Capiçoba

In Brazil, known as "*cariçoba*" or "*capiçova*", the *Erechtites valerianifolius* is a member of the Asteraceae family.[17] This plant is a source of iron, zinc, phosphorus, and vitamin A[15] and is commonly consumed as a cooked ingredient in soups and sauces.[3] It is also considered a novel edible specimen that may encourage healthier dietary habits.[18]

Caruru

Commonly referred to as "*caruru*" in Portuguese, the *Amaranthus viridis L.* is also known by other local names in Brazil (e.g., "*caruru-de-cuia*", "*caruru -roxo*", "*caruru-de-mancha*", "*caruru-de-porco*", "*caruru-de-espinho*", "*bredo-de-chifre*", "*bredo-de -espinho*", "*bredo-vermelho*", or simply "*bredo*"). It is frequently found and consumed in Asia, especially Pakistan.[19]

The plant is rich in phenolic compounds, including flavonoids, vegetable tannins, and phenolic acids, which confer its antioxidant activity. It exhibits antimicrobial effects, contains high levels of vitamins from the A and B complex, and has been used for treating diarrhea, dysentery, heavy menstrual bleeding, ulcers, and intestinal hemorrhages.[7,20,21]

Ora-pro-nóbis

Pereskia aculeate Miller, commonly known as *ora-pro-nóbis*, is a native leafy vegetable from Central and South America and the southern United States.[22] In Brazil, it is found mainly in the Northeast and Southeast regions. This plant propagates easily, requires low water input, and has a low susceptibility to diseases, making it ideal for domestic cultivation as a low-cost nutritional resource.[23]

The plant is important for the human (soups, stir-fries, scrambled eggs, omelets, salads, cookies, and savory pies) and animal nutrition due to its high protein content, mucilaginous dietary fibers, and the absence of toxicity in its leaves.[24]

Ora-pro-nóbis is also present in flour, savory dishes, and pasta formulations. In the food industry, a tagliatelle-type pasta enriched with dehydrated *ora-pro-nóbis* has been developed and approved with a consumer acceptance rate over 70%.[25]

Nutritionally, this plant is distinguished by its exceptionally high iron content (14.18 mg per serving), exceeding common iron-rich foods, such as raw beetroot (1.43 mg), cooked beetroot (2.13 mg), kale (2.70 mg), spinach (4.48 mg), beef liver (12.89 mg), raw chickpeas (6.16 mg), and raw lentils (7.91 mg).[26]

Edible compounds of unconventional food plants

Table 1. Edible parts of unconventional food plants.

Author	Objective	Findings
Viana *et al*., 2015	To evaluate the phytochemical composition of plant species classified as unconventional leafy vegetables.[7]	The leaves of *Rumex acetosa* ("*Azedinha*") can be consumed raw, cooked, or as a seasoning and may be used to prepare salads, purees, and soups.[7]
Oliveira *et al*., 2019	To evaluate the production of *T. triangulare* and *T. paniculatum* in response to different doses of organic fertilizer.[27]	The leaves, stems, and sprouts of *Talinum paniculatum* (*Beldoegrão*) are commonly used in culinary preparations.[27] The leaves can be eaten raw but are preferably used in sautés and soups. These parts may also be combined with meats, fish, and shrimp.[28]
Moraes *et al*., 2008	To study the flower production of *Tropaeolum majus* and cabbage heads grown in monoculture and intercropping systems.[32]	All aerial parts of *Tropaeolum majus* ("*capuchinha*") are edible, including stems, leaves, flowers, flower buds, and unripe fruits. Its flowers and leaves are rich in vitamin C and can be used in salads.[16]
Brazil, 2008	Manual of Unconventional Leafy Vegetables	*Erechtites valerianifolius* ("*capiçoba"*) has slightly bitter leaves that are usually consumed sautéed and typically served with rice and beans.[29]
Fink *et al*., 2018	To gather knowledge through a bibliographic review	All parts of *Amaranthus viridis* ("*caruru"*) are edible. The seeds can be ground into flour, and the leaves are commonly used in salads. It is a UFP with high protein content.[30]

CONCLUSION

Numerous UFP have well-established nutritional values and can be safely incorporated in daily diets. However, they are little known and underused by the Brazilian population. Most of these plants have a pleasant flavor and high concentrations of fiber, vitamins, and minerals necessary for maintaining body homeostasis. They can also be used in various daily food preparations, whether in family meals or large gastronomic centers.

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REVIEW ARTICLE

EFFECTS OF DEPRESCRIBING OF PROTON PUMP INHIBITORS

EFEITOS DA DESPRESCRIÇÃO DE INIBIDORES DE BOMBA DE PRÓTONS

Rebeca Martins de Paula da Mota Silveira[1/+], Fábio Menezes de Melo[2]

[1] Medical Student at the Faculdade de Medicina de Olinda – FMO; [2] Gastroenterology Specialist and Professor at the Faculdade de Medicina de Olinda - FMO

ABSTRACT

Introduction: Proton pump inhibitors (PPI) are the most prescribed medications worldwide due to their effectiveness in treating gastric diseases, low toxicity, and ability to inhibit acid secretion. However, prolonged use of PPI may lead to serious complications and health risks for patients. Increasing attention has been given to the deprescription of PPI to reduce dosage or discontinue medications that may cause harm — considering the benefits, treatment purpose, convenience, age of the patient, and cooperation. **Objective:** To conduct a literature review on the positive and negative effects of deprescribing PPI. **Methods:** A narrative review was conducted using the Brazilian Virtual Health Library, SCIELO, and LILACS databases, with the following descriptors: deprescription, toxicity, gastric acid, and esophagitis. A total of 15 articles published in the last 12 years were selected, focusing on three main themes: PPI effect on gastric secretion, complications associated with prolonged use, and the importance of deprescription. **Results:** Several patients self-medicate or continue previous treatments without medical supervision. Moreover, using multiple medications without prior analysis for pathology may lead to complications. In this context, deprescription (especially of PPI) plays a key role in preventing adverse effects, worsening of diseases, and complications of pre-existing conditions. Deprescription also enhances patient safety by reducing exposure to adverse drug reactions, medication errors, drug interactions, and unnecessary hospitalizations. **Conclusion:** PPI are unnecessary for all digestive disorders but effective for gastric conditions. Therefore, a multidisciplinary team is essential for evaluating treatment and implementing safe deprescription strategies. Deprescription should follow a comprehensive therapeutic approach aimed at minimizing harm to the health and well-being of the patient.

Keywords: Deprescription; Toxicity; Gastric acid; Esophagitis.

RESUMO

Introdução: Entre os medicamentos mais prescritos mundialmente encontram-se os inibidores da bomba de prótons (IBPs), amplamente utilizados no tratamento de doenças gástricas por sua eficácia, baixa toxicidade e ação sobre a secreção ácida. No entanto, o uso prolongado desses fármacos pode causar sérias complicações e prejuízos à saúde dos pacientes que os utilizam de forma contínua. Com o intuito de reduzir a dose ou interromper o uso de medicamentos potencialmente prejudiciais, tem-se investido na desprescrição de IBPs, processo que deve considerar os benefícios, a finalidade do tratamento, a comodidade, a idade e a cooperação do paciente. **Objetivo:** Realizar uma revisão de literatura sobre os efeitos negativos e positivos da desprescrição dos inibidores da bomba de prótons. **Métodos:** Revisão narrativa realizada nas bases de dados da Biblioteca Virtual em Saúde (BVS), SCIELO e LILACS, utilizando os descritores: desprescrição, toxicidade, ácido gástrico e esofagite. Foram selecionados 15 artigos publicados nos últimos 12 anos, abordando três núcleos temáticos: ação dos IBPs sobre a secreção gástrica, complicações decorrentes do uso prolongado e a importância da desprescrição. **Resultados:** Muitos pacientes recorrem à automedicação ou mantêm tratamentos anteriores sem acompanhamento médico. Além disso, o uso simultâneo de múltiplos fármacos, sem análise adequada da patologia, pode resultar em diversas complicações. Nesse contexto, a desprescrição, especialmente dos IBPs, surge como estratégia para prevenir efeitos indesejados, agravamento de doenças e complicações associadas a condições pré-existentes. Sua importância reside em evitar o uso prolongado e indiscriminado desses medicamentos, garantindo a segurança do paciente e minimizando riscos como reações adversas, erros de medicação, interações medicamentosas e hospitalizações.

Conclusão: Embora os IBPs sejam eficazes no tratamento de doenças gástricas, são desnecessários em

alguns casos de patologias digestivas. Assim, destaca-se a relevância da atuação de uma equipe multidisciplinar na avaliação do tratamento e na condução da desprescrição. Conclui-se que essa prática requer uma abordagem integral, voltada à escolha terapêutica que cause o menor impacto possível à saúde e à qualidade de vida do paciente.

Palavras-chave: Desprescrição. Toxicidade. Ácido gástrico. Esofagite.

INTRODUCTION

Using multiple medications is effective and sometimes necessary for addressing specific clinical conditions. However, the potential harm of polypharmacy often outweighs the benefits, raising concerns that have been included among the three priority areas of the Third Global Patient Safety Challenge of the World Health Organization.[1]

This challenge seeks to dismantle the concept of polypharmacy, commonly seen in the treatment of conditions such as gastric disorders, through strategies such as deprescription. Deprescription is one of the key approaches used to reduce polypharmacy and, consequently, its associated risks.[2,3]

Among the most prescribed medications worldwide are proton pump inhibitors (PPI). These drugs have been widely used to treat gastric conditions due to their efficacy in suppressing acid secretion and relatively low toxicity.[4]

Although effective in short-term use, long-term PPI therapy has been related to serious complications since it hinders the absorption of vitamins and minerals that depend on gastric acidity. Moreover, the altered gastric pH may impair the absorption of other medications, potentially compromising their therapeutic effect[5].

To reduce exposure to potentially harmful medications, significant efforts have been made to deprescribe PPIs. This process must consider the benefits and purpose of treatments, patient convenience, age, and cooperation.[6]

Deprescribing is not a random decision and requires identifying and discontinuing the use of unnecessary, ineffective, unsafe, or potentially inappropriate medications. Although PPI may be beneficial, simultaneous use with other drugs may render them ineffective and lead to harmful effects.

This study is justified by scientific evidence and empirical observation suggesting that despite being intended for short-term treatment, patients often continue taking PPI indefinitely without knowing their long-term consequences. The present study is a narrative review aiming to compile secondary data on PPI use and discuss its implications.

This research highlights current knowledge, presenting new perspectives on the topic, and supporting the notion that inappropriate PPI prescription may be harmful and compromise patient health.

METHODS

This study is a narrative review. The data presented are based on scientific articles published between 2007 and 2019. Books, doctoral theses, and a manual published by the Brazilian Ministry of Health were also considered to support the theoretical and historical foundation and enrich the discussion.

The literature search used the Brazilian Virtual Health Library SCIELO, and LILACS databases. The following descriptors were used: deprescribing, toxicity, gastric acid, and esophagitis. Abstracts were reviewed, and articles were selected according to the following inclusion criteria: publications from the last 12 years, available online, and written in English.

From this perspective, three thematic areas emerged: PPI effect on gastric secretion, complications associated with prolonged use, and the importance of deprescribing PPI.

RESULTS AND DISCUSSION

PPI effect on Gastric Secretion

The H^+/K^+ ATPase enzyme (proton pump) is responsible for secreting hydrochloric acid into the stomach lumen. These enzymes are activated by different stimuli generated by histamine, gastrin, and acetylcholine, and are involved in the acid production process using hydrogen (H^+) and potassium (K^+) ions exchange, a process that requires ATP.[4]

PPI inhibits gastric acid production, making the gastric pH more alkaline. These drugs block the final step in the hydrochloric acid production pathway in gastric disorders. This mechanism provides strong acid suppression, making PPI the first-line therapeutic option.[7]

Moreover, the covalent binding of the drug to the enzyme occurs at the cysteine residue, leading to irreversible inhibition. After this interaction, the proton pump is not regenerated, and acid production resumes only after synthesizing a new enzyme. This irreversible inhibition ensures an effect that lasts between 24 and 48 hours.[6]

Complications: Long-Term Use of PPI

The currently available PPI in the pharmaceutical market include omeprazole, lansoprazole, pantoprazole, esomeprazole, dexlansoprazole, and rabeprazole.[3] Among these, omeprazole is the most prescribed drug[8] for treating digestive system disorders, such as gastric and duodenal ulcers, gastroesophageal reflux disease, and erosive esophagitis.[9]

A study conducted in Germany with 74,000 individuals aged 75 years or older found a high prevalence of dementia among patients undergoing continuous PPI treatment. The most frequently used PPI included omeprazole, esomeprazole, lansoprazole, pantoprazole, and rabeprazole.[10]

Chronic PPI usage might increase the risk of fractures,[11] as PPI may inhibit the proton pumps in osteoclasts, thus interfering with bone metabolism.[12]

A retrospective study in Pennsylvania showed that prolonged PPI use reduces calcium absorption and bone integrity. Patients who used PPI for more than one year had a 44% increased risk of fractures in the coccygeal region.[13]

Research by Herzin and colleagues revealed that reduced gastric acidity may lead to bacterial overgrowth and subsequent pneumonia in outpatient and hospitalized patients.[12] This microbial proliferation occurs because the elevated gastric pH (above 4) facilitates their growth. On the other hand, when the stomach pH returns to its normal acidic state, microbial growth is suppressed.

Regarding gastric alterations, PPIs are indicated for treating peptic ulcers (duodenal and gastric), reflux esophagitis, and Zollinger-Ellison syndrome. However, a controversy regarding their use exists, as PPI has been associated with proliferative changes in the gastric mucosa.[14]

Additionally, when combined with medications to treat *Helicobacter pylori*, PPI may contribute to gastric cancer due to the change from an antral-predominant chronic gastritis to a corpus-predominant chronic gastritis, which increases the risk of gastric neoplasia.[15]

Due to reduced gastric acidity, long-term use of PPI also affects absorbing other micronutrients, such as vitamin B12 and iron.[15] In older patients who may already suffer from gastric atrophy, often caused by *H. pylori* infection, chronic PPI use may further reduce serum vitamin B12 levels.[15] Vitamin B12 deficiency exacerbates conditions, such as dementia, especially in older adults.[10]

As for iron absorption, heme and non-heme iron may be affected during long-term PPI treatment.[16] However, this effect is generally mild and has not been directly linked to an increased risk of iron deficiency.[15]

Importance of PPI Deprescription

Several patients self-medicate- or continue previous treatments without medical supervision. Furthermore, the use of multiple drugs without prior analysis of patients conditions may lead to several complications, as previously discussed.

Therefore, deprescribing medications, particularly PPI, is one of the strategies to avoid undesirable effects, new illnesses, and conditions worsening. Deprescription must follow specific steps and needs to be a medical decision that should be planned and supervised, since dose reduction or abrupt discontinuation may also lead to adverse consequences, such as symptom relapse.[3]

Thus, this approach also aims to bring together interdisciplinary healthcare teams in the process and to ensure monitoring for adverse withdrawal reactions, especially in older patients.[11]

The importance of deprescription lies in preventing PPI from being prescribed for an indefinite period, often without the awareness of patient of the reasons for the treatment. It also promotes patient safety by avoiding exposure to adverse reactions, medication errors, drug interactions, and hospitalizations resulting from such complications.[2]

Deprescription should be considered particularly in older patients who have completed at least four weeks of PPI therapy. Tapering the daily dose, discontinuing treatment, or switching to an as-needed basis is advisable. An H2 receptor antagonist may also be considered as an alternative to PPI.[5]

FINAL CONSIDERATIONS

PPIs are used empirically, either by prescrip-

tion or self-medication, to treat or prevent digestive diseases.

PPI is the most advanced pharmacotherapeutic option for treating digestive disorders (the most potent inhibitors of acid secretion), playing a key role in managing several gastric pathologies.

However, PPI use is unnecessary for some digestive disorders. These findings highlight the importance of a multidisciplinary team during treatments to reduce the prescription of gastric secretion inhibitors.

Finally, to implement deprescription, we suggest adopting a comprehensive approach to treatment and selecting the least harmful option to their health.

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SUSTAINABLE DEVELOPMENT GOALS AND HEALTH PROMOTION: AN ESSENTIAL ALLIANCE AGAINST CHRONIC DISEASES

OBJETIVOS DO DESENVOLVIMENTO SUSTENTÁVEL E PROMOÇÃO DA SAÚDE: UMA ALIANÇA NECESSÁRIA AO ENFRENTAMENTO DAS DOENÇAS CRÔNICAS

Simone Tetu Moyses[1/*,2], Paulo Sávio Angeiras de Goes[2,3]

[1] Full professor at the Pontifícia Universidade Católica do Paraná (PUC), Brazil, [2] Associate professor at the Universidade Federal de Pernambuco (UFPE)/Faculdade de Medicina de Olinda, Brazil, [3] PhD in Epidemiology and Public Health from University College London (UCL), England.

ABSTRACT

The Sustainable Development Goals (SDG) have been a priority agenda for building an equal and just society, which will directly impact the approach to chronic health conditions. This study aimed to analyze how the SDG outline the adoption of health promotion measures capable of impacting chronic diseases. This narrative literature review was based on the theoretical framework of the SDG and recommendations from global conferences on health promotion held over the last decades. The SDG can be approached from two perspectives: contextual, which is represented by the challenges of contemporary society; and discussions about the role of health professionals. Considering the complexity of health and its social determinants, effective health promotion should not rely solely on the dissemination of information and self-care from an individual perspective.

Keywords: Health promotion; Health determinants; Sustainable development

RESUMO

Os Objetivos do Desenvolvimento Sustentável (ODS) têm sido apontados como uma agenda prioritária para a construção de uma sociedade mais igualitária e socialmente justa. Constituem-se numa agenda cujos resultados terão repercussão direta na abordagem das condições crônicas. O objetivo do presente estudo foi analisar como os ODS delineiam a adoção de medidas de promoção de saúde capazes de produzir impacto nas doenças crônicas. Trata-se de uma revisão de literatura narrativa a partir do referencial teórico dos ODS e das recomendações das conferências mundiais de promoção de saúde realizadas nas últimas décadas. Conclui-se que os ODS podem ser trabalhados em duas dimensões: uma contextual, representada pelos desafios postos pela contemporaneidade, e outra relativa à discussão sobre o papel dos profissionais de saúde. Considerando a saúde na sua complexidade, envolvida e relacionada com determinantes sociais, reforça-se que não é possível promover a saúde apenas transmitindo informação e buscando o autocuidado numa perspectiva individual.

Palavras-chave: Promoção de saúde; Determinantes de saúde; Desenvolvimento sustentável

CHALLENGES OF THE CONTEMPORARY PERIOD FOR HEALTH

Considering the new Anthropocene era characterized by significant human impact on the planet at a socio-environmental level, discussing the Sustainable Development Goals (SDG) and health promotion is crucial for professional training and individual life to highlight opportunities and challenges in protecting life and health.

Challenges related to health include epidemiological, demographic, and nutritional transitions in the current generation. Increased life expectancy, premature mortality rates, and decreased fertility rates highlight new profiles for healthcare. Also, nutritional transition reflects lifestyle changes, including increased sedentary behavior, changes in dietary patterns and food production methods and distribution, and a tendency to reduce malnutrition and increase obesity. In Brazil, overweight affects 54% of adults and 34% of children, significantly impacting chronic diseases[1].

Additional challenges are involved in the

transitional processes, including urbanization and industrialization and their impacts on the lives of individuals and health of the Brazilian population. In Latin America, 80% of the population resides in urban areas, and nearly 90% of Brazilians are expected to live in these areas by 2050, representing a considerable demographic increase. This increase intensifies the demand for essential resources for adequate living (e.g., access to water, sewage, security, and healthcare services) and results in behavioral changes. Thus, these changes may lead to excessive consumption, exploitation of natural resources and workers, and loss of protections for social security.

Violence is another significant health-related challenge. Epidemiological data revealed a sharp increase in chronic health conditions associated with insecurity and domestic and traffic-related violence. For example, traffic accidents are the leading cause of death among Brazilians aged 15 to 29 years.

Environmental degradation, evidenced by increased pollution, wildfires, floods, and droughts, is among the challenges that must be addressed. Climate change (which is not merely in weather patterns) reflects the impact of human activity on the environment and is emerging as a distinct risk factor for the development of chronic health conditions and diseases.

Beyond inequalities, inequities (i.e., unjust inequalities that could be addressed through collective protection policies) represent a contemporary challenge with impact on health and the incidence of chronic health conditions. A recent World Bank report warned about the increase in poverty in Brazil, where over 43 million people live with less than $5.00 per day, with numbers continuing to increase. This situation requires a critical evaluation of public policies or the lack thereof. Inequities within urban spaces should be observed, tackling what some authors have called urban penalty[2], which exacerbates risks and health issues within city living spaces. For instance, individuals living in the periphery of São Paulo (Brazil) die about 20 years earlier than individuals living in central areas of this city. This disparity reflects not only biological risk factors but also unequal access to quality healthcare services and inequities in the distribution of power, information, financial resources, and access to and availability of technologies.

Inequities in access to health technologies are evident among healthcare professionals and the general population. Despite significant advances, the distribution of these technologies is inversely related to health needs and remains concentrated among the wealthiest[3]. These inequities impact access to science, technology, and innovation, including new drugs, diagnostic tools, new ideas, institutional arrangements, and practical innovations.

Basu and Stuckler (2014)4, in their book entitled "The Body Economic: Why Austerity Kills", discussed how inhumane economic policies, such as economic austerity, have harmed public health across different contemporary societies. Also, their analysis of the global financial crisis, income distribution, and healthcare investments demonstrated how economic decisions affect health worldwide, including Brazil.

In this sense, understanding contemporary global challenges allows for a broad contextualization of healthcare, highlighting new questions, opportunities, and responsibilities for health professionals and their role in society.

HEALTH AGENDAS AND THE ROLE OF HEALTH PROFESSIONALS

Effective and high-quality healthcare practices require that the training of health professionals goes beyond the treatment of acute diseases and emergency care. In Brazil, healthcare professionals often manage acute and chronic conditions within the same outpatient unit; thus, competencies need to be developed to address chronic health conditions adequately.

In this article, the term chronic health conditions was used to expand the concept of chronic diseases since many chronic conditions requiring specialized healthcare are not diseases, such as pregnancy. Considering that pregnancy requires person-centered care focusing on women health throughout its course, it is described as a chronic health condition.

Regarding the global rise in chronic health conditions, the impact of poverty and health inequities should be considered on their development and management. Growing evidence have supported health institutions in reconsidering the direct relationship and impact of life context, development, and socio-environmental determinants on population health. Also, the World Health Organization has promoted international agendas that focus on the im-

pacts of these factors on health, encouraging international mobilization of efforts to develop healthcare systems based on socio-environmental determinants of health and disease.

In this context, the SDG[5] emerged as a strategy reflecting the converging agendas that have worked over the past few years toward the eradication of the main determinants of living conditions. The SDG are presented as an action plan to eradicate poverty, safeguard the planet, and promote human development in an environment of prosperity and peace.

Member states of the United Nations defined this global agenda in September 2015 and signed an agreement to intentionally develop proposals and practices for modifying poverty profiles and promoting sustainable human development. This agenda has spread worldwide, aiming to address 17 goals, 169 associated targets, and 231 indicators, directing governments, societies, and international organizations to develop concrete action plans. The SDG were designed around five critical dimensions for the protection of life: people, focused on poverty eradication, hunger control, and access to quality education to ensure dignity and equity; planet, focused on safeguarding the planet, natural resources, and climate; prosperity, ensuring fulfilling lives in harmony with nature; peace, focused on promoting peace in just and inclusive societies; and partnership, focused on developing partnerships for implementation of solid global action. Thus, the SDG agenda is focused on collective and intersectional approaches to improve equity. Also, it recognizes that addressing the risks associated with how humans currently live on the planet requires the development of strategies that involve different sectors of society to mitigate global inequities, which have a significant impact on the potential for human development and health. The SDG are often called the 2030 agenda since they are defined to be reached by 2030.

In 2018, a Brazilian commission was organized to discuss and adapt these goals and associated targets. Thus, the commission expanded the associated targets from 169 to 175 for the Brazilian context, with technical support from the Institute for Applied Economic Research. Also, the Brazilian Institute of Geography and Statistics committed to monitoring advances and tracking indicators on a dedicated page on its website.

The central role of health in the SDG agenda is highlighted by the three core dimensions of sustainable human development (i.e., social, environmental, and economic) and other dimensions of development (e.g., psychological and relational), requiring commitment and intersectional approaches. Therefore, health professionals and citizens living from the South to Northeast of Brazil must engage in collective action plans, identifying potentialities to reduce inequities and construct a promising future for life on the planet.

Health professionals should emphasize the connection between health and human development by focusing on individuals and their lives within this context. In addition, they should evaluate how each individual experiences their development process, analyzing their potential to build a positive life with culture and protection of peaceful contexts, including a life without violence and with a supportive perspective.

In this sense, recognizing the complexity of health implies addressing the social determinants of health and understanding the factors that influence staying healthy or falling ill in the contemporary world. Therefore, addressing socio-environmental determinants as key factors in health is a complex task and the main challenge in healthcare.

A variety of international and national health agendas and movements have addressed issues related to the social determinants of health, outlining strategies for addressing inequities. Key discussions included the importance of primary health care in Alma-Ata (Alma-Ata Declaration of 1978), First International Conference on Health Promotion, starting in 1986, development of the principles of the Brazilian Unified Health System (SUS) in the Brazilian Constitution, and recommendations from international and Brazilian commissions on social determinants of health and National Health Promotion Policy. These movements have reinforced the importance of comprehensive, intersectoral actions that prioritize equity, ensuring quality of life and health for all.

Chart 1 highlights some of these movements with significant resonance in Brazil and their recommendations for addressing health inequities.

Chart 1. Movements and events on social determinants of health and recommendations for addressing health inequities.

Year	Event	Recommendations
2000	International commission affiliated with the World Health Organization to discuss health inequalities and inequities.	Recommended actions guiding efforts on social determinants and reducing inequities: improve daily living conditions; address the unequal distribution of power, money, and resources; and analyze and understand the problem by assessing the impact of actions.
2000	Brazilian Commission on Social Determinants of Health.	Recommend working in three major areas to reduce health inequities in Brazil: focus on intersectoral work; strengthen social participation as a central issue; and develop actions based on scientific evidence.
2006/2014	National Health Promotion Policy	Recommended promoting structural changes in environments and establishing legislative and regulatory measures and policies to guarantee access to health in Brazil.
2016	9th International Conference on Health Promotion – China.	Recommended focusing on the key areas for health promotion: good government, health literacy, and healthy cities.
2016	22nd International Union on Health Promotion and Education World Conference on Health Promotion – Curitiba.	Recommended expanding the discussion on health promotion and building equity.

The principles of SUS (i.e., universality, integrality, and equity in care and social participation) are the foundation for the National Health Promotion Policy. This policy guides actions that target the social determinants of health, the pursuit of equity, respect for diversity, sustainable development, and inclusive and solidarity-based promotion of health and care.

The World Conference on Health Promotion held in Curitiba in 2016[6] was another important milestone for health promotion and equity. It highlighted for professionals involved in health promotion the urgent need to change care practices, from a biomedical model to a socio-environmental perspective, considering social justice and democracy as essential values for health promotion. In this comprehensive perspective, promoting health and sustainable development in Brazil requires defending SUS, democracy, and equity. Thus, contemporary health professionals must learn to address new and longstanding issues in diverse contexts, recognize vulnerable individuals, reconsider health technologies, cities, and collective living spaces, and collaborate with different people and institutions to influence social determinants of health. This perspective for developing professional competencies highlights not only technical skills but also critical reflection and transformative action within society.

Health professionals must evaluate the impact of economic factors and austerity policies on health outcomes and develop models for care and service management that address vulnerabilities to propose new strategies and ensure the quality of health services. Moreover, they must analyze the value and impact of health promotion practices with effectiveness within the local context and engage in intersectoral actions that extend health promotion efforts beyond traditional sector boundaries.

As researchers, contemporary health professionals must commit to producing knowledge that transforms reality and addresses the challenges faced by society. Therefore, scientific production must result in knowledge that contributes to sustainable development and health promotion without losing time.

Academic training should be centered on health promotion and sustainable development, which requires overcoming conceptual imprecision, particularly regarding inequities, sustainable development, and health determinants and promotion. Health professionals can no longer view health promotion solely as health education and behavior change since this is only one dimension of health promotion. Health should be understood as a complex phenomenon strongly influenced by social determinants. Thus, promoting health and sustainable development involves supporting empowered and resilient individuals, building people-centered health systems, and acting comprehensively to transform living environments.

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PREVENTION AND MONITORING OF PATIENTS WITH SYSTEMIC ARTERIAL HYPERTENSION AT THE FAMILY HEALTH UNITY OF PAULISTA-PE

PREVENÇÃO E ACOMPANHAMENTO DOS PORTADORES DE HIPERTENSÃO ARTERIAL SISTÊMICA DA UNIDADE DE SAÚDE DA FAMÍLIA, LOCALIZADA EM PAULISTA-PE

Rebeca Martins de Paula da Mota Silveira[1/*], Débora Maria Azevedo Silva[1], Maria Laura Guedes de Siqueira[1], Túlio Gabriel Araújo Alves[1], Elizabethe Carolina Pedra Rica de Jesus Pereira[2]

[1] Students at the Faculdade de Medina de Olinda, [2] Professor at the Faculdade de Medicina de Olinda

ABSTRACT

In primary health care, the Health Ministry recommends that hypertensive patients with uncontrolled arterial pressure who follow the recommended treatments attend monthly medical appointments until they achieve the target blood pressure. Therefore, the proposed intervention occurred in a community of 8000 users with high hypertension populational rates, lack of information, low socioeconomic status, and poor commitment to medical appointments and Hiperdia (Brazilian protocol to deal with high blood pressure). Actions directed to the awareness and prevention of hypertension impairments were conducted to reduce the new cases of hypertension. This experience report aimed to enhance engagement in the treatment and follow-up of hypertensive patients registered at the Family Health Unit (FHU) of Francisco Marcelo Dias in Paulista, Pernambuco. The problematization strategy based on Maguerez Arch theory was used to identify the main problems of the area, theorization, solution hypothesis prediction, and plan of action. The actions prioritized prevention and awareness to achieve a better quality of life and prevent the development of hypertension and disease progression. The activities conducted at the FHU included blood pressure measurements and conversation circles about the importance of a healthy diet and the continuous use of medications. These actions positively impacted the number of patients attending medical appointments, Hiperdia, as well as treatment adherence. Additionally, the expected outcome of the motivations for changes in lifestyle habits in the long term is a decrease in new hypertensive patients in the area. The promotion of adequate health for hypertensive patients in this community, along with interventions for preventing and treating systemic arterial hypertension, increased treatment adherence and led to changes in lifestyle habits. These actions improved the health quality of diagnosed hypertensive patients and prevented disease development.

Keywords: Primary Health Care; Health Education; Hypertension.

RESUMO

Na atenção primária à saúde, o Ministério da Saúde recomenda que pacientes hipertensos que estiverem com a pressão arterial descontrolada, mas que estejam cumprindo os tratamentos recomendados, deverão realizar consulta médica mensal para reavaliação, até atingirem a meta pressórica estabelecida. Baseado nisso, o projeto aplicativo aconteceu em uma comunidade com 8000 usuários, onde há uma elevada taxa de hipertensão entre a população, associada à falta de informação, baixa condição socioeconômica e falta de adesão às consultas e ao Hiperdia. A partir desse cenário, foram realizadas ações que implicassem na conscientização e prevenção das complicações da hipertensão e na redução do número de novos hipertensos na área. Melhorar a adesão ao tratamento e acompanhamento dos hipertensos cadastrados na FHU Francisco Marcelo Dias, em Paulista-PE. Estudo descritivo do tipo relato de projeto aplicativo. Utilizou-se a metodologia da problematização, baseado no Arco de Maguerez para identificação do problema base da área, teorização, criação de hipóteses de solução e um plano de ação. As ações prezaram a prevenção e conscientização para uma melhor qualidade de vida, evitando assim tanto o desenvolvimento da hipertensão como também a evolução da doença. Para isso, as atividades realizadas na FHU foram aferição da pressão arterial e rodas de conversa sobre a importância da alimentação saudável e o uso contínuo dos medicamentos. Essas ações tiveram um bom impacto ao modo que aumentaram o número de pacientes nas consultas e no Hiperdia, aumentaram a

quantidade de adeptos ao tratamento, e através do incentivo à mudança nos hábitos de vida, espera-se que a longo prazo haja uma diminuição no número de novos hipertensos na área. A promoção de saúde adequada para os pacientes hipertensos da comunidade, assim como a intervenção para a prevenção e tratamento da hipertensão arterial apresentou implicações clínicas importantes, uma vez que foi capaz aumentar a adesão ao tratamento e a mudança nos hábitos de vida, prevenindo futuros pacientes hipertensos e melhorando a qualidade de vida dos hipertensos já diagnosticados da área.

Palavras-chave: Atenção Primária a Saúde; Educação em Saúde; Hipertensão.

INTRODUCTION

Usually known as high blood pressure, systemic arterial hypertension (SAH) is characterized by blood pressure equal to or greater than 140 by 90 mmHg. The pressure rises mainly due to contractions in the vessels in which the blood circulates. The heart and vessels can be compared to an open tap connected to several nozzles; if the ends of the nozzles are closed, the pressure inside increases. The same happens when the heart pumps blood; if the vessels are narrowed, the pressure rises.

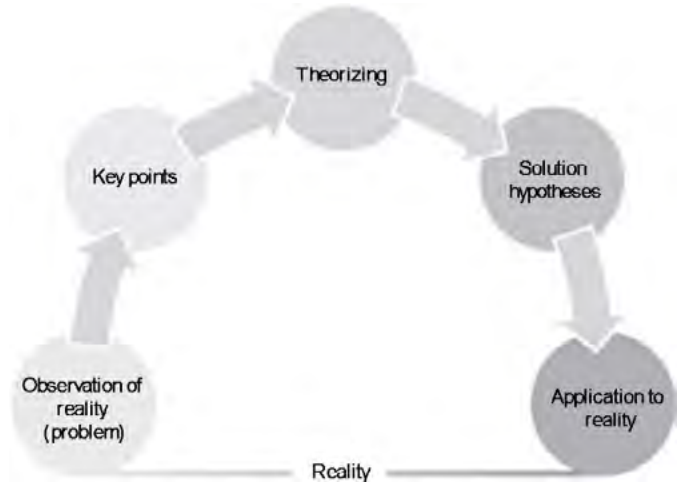
The heart is an efficient pump that beats 60 to 80 times a minute, transporting 5 to 6 liters of blood throughout the body. Blood pressure is the force that the heart uses to pump blood through the vessels, determined by the volume of blood leaving the heart and the resistance it encounters while circulating through the body.

Blood pressure can be modified by variations in blood volume or viscosity, heart rate, and vessel elasticity. The hormonal and nervous stimuli that regulate blood pressure are influenced by internal and environmental factors, as well as poverty. The latter affects health strongly and consistently as tobacco, alcohol, sedentary lifestyle, hypertension, obesity, and diabetes.

The Brazilian Society of Hypertension estimates that 25% of the Brazilian population suffers from SAH, and in people over 60 years, the percentage rises to over 50%.

METHODS

Based on the Maguerez Arch theory, the problematization methodology was used to explore the content of the work. Using this methodology, the entire learning process begins with contact and reading of reality.



The students from the Faculdade de Medicina de Olinda identified the main problem to work on, which consisted of controlling and improving the hypertension profile among users of the Francisco Marcelo Dias Family Health Unity (FHU). Workshops were organized to provide tools for constructing interventions to transform reality. These plans were defined based on the solution hypothesis defined by a theoretical and reflective study about the explanatory chain of causes and consequences of the problems identified. The main advantage of this methodology is the possibility for actors who identify unsatisfactory aspects in reality to conduct qualified interventions supported by references from situational strategic planning g.

The situational diagnosis enabled the understanding of the studied area and the main problems faced by FHU. It allowed for the collection of information and identification of potential resources for planning response actions within a short period and at minimal cost, enabling the population to pinpoint their needs and problems.

In the theorization stage, SAH was considered one of the most important public health problems at the moment; this disease has a high prevalence and low control rates and is one of the main modifiable risk factors. Since SAH is an asymptomatic disease, individuals are not aware of the need to control it and of the importance of treatment to sta-

bilize blood pressure levels and minimize its effects.

Developing possible solutions hypotheses consisted of drawing up an action plan for the problem identified as a priority. The action involved students from the Faculdade de Medicina de Olinda, community health workers, and the Francisco Marcelo Dias FHU population in the municipality of Paulista, Pernambuco.

Plan of Intervention

Strategy	Actions	Activities	Responsibles	Participants	Human Resources	Materials	Chronogram
An action plan to increase treatment adherence and improve follow-up by the family health team to prevent complications from hypertension at the Francisco Marcelo Dias FHU.	Prevention and awareness-raising for a better quality of life, avoiding the development of hypertension and its progression.	Blood pressure checks, conversations about the importance of healthy eating, and the continuous use of medicines.	Students: Débora Maria Azevedo, Maria Laura Guedes, Rebeca Martins, Túlio Gabriel.	FHU Francisco Marcelo Dias team, hypertensive patients and at-risk population in the community, students: Débora Maria Azevedo, Maria Laura Guedes, Rebeca Martins, Túlio Gabriel.	Nurse Nurse technician Doctor Community health workers	Blood pressure measurement: stethoscope and sphygmomanometer. Conversation circles: banners, posters, booklets, and breakfast.	10.12.2018 8:30: breakfast 9:30: conversation circle about the importance of a healthy diet, prevention, and continuous use of medicines. 10:30: pressure measurement.

To prevent the development of SAH and disease progression, preventive measures and awareness-raising initiatives were proposed to improve quality of life, including regular blood pressure checks, conversation circles on the importance of a healthy diet, and the continuous use of medication.

Implementation Challenges (Viability)

The biggest challenge was to reach the target public effectively, as the visit to the FHU did not coincide with the day of patient attendance for SAH. Another factor that hindered the progress of the project was the absence of the FHU nurse due to her weekly leave.

CONCLUSION

In conclusion, the objectives were gradually achieved throughout the implementation period.

Promoting adequate health for SAH patients using an intervention to prevent and treat arterial hypertension presented important clinical implications. These actions may reduce or even eliminate the need for antihypertensive drugs, avoiding the adverse effects of drug treatment and lowering the cost of treatment for patients and healthcare institutions.

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THE LAWS OF MEDICINE: FIELD NOTES FROM AN UNCERTAIN SCIENCE

Paulo Sávio Angeiras de Goes[1], Tereza Adriana Miranda de Almeida[2]

[1] Professor Associado da UFPE, Coordenador de Pesquisa da FMO, [2] Diretora de Relações Institucionais da FMO

Siddhartha Mukherjee, a renowned professor and researcher at Columbia University in New York, offers reflections in his book The Laws of Medicine: Field Notes From an Uncertain Science (Editora Alaúde, 2019) as part of the TED collection. A specialist in the field of oncology, his laboratory's mission is to discover innovative medications for cancer treatment. His career includes the authorship of the non-fiction book The Emperor of All Maladies (Editora Companhia das Letras, 2012), for which he won the Pulitzer Prize in 2011, one of the most prestigious awards, as well as publishing studies in important medical journals.

In The Laws of Medicine: Field Notes From an Uncertain Science, Mukherjee proposes the idea that medicine, as a science, would need to have laws, pointing out that science with immutable laws is very common in physics and mathematics but less so in chemistry, and rare in biology. From reading the book The Youngest Science: Notes From a Medicine-Watcher, written by fellow doctor Lewis Thomas, who describes his internship and residency period in the 1930s as a student at Harvard Medical School.

Reflecting on the evolution of medicine, especially clinical medicine in recent years, Mukherjee adds what he considers to be the laws of medicine. Initially, he recognizes that his book deals with information, imperfections, and uncertainties. Furthermore, the author problematizes that around 25 years ago, when he reached the fourth year of medical school, he had acquired enormous knowledge, but reflects that he lacked the knowledge of what to do with it, which is now just a click away from the computer. Mukherjee considers that the challenge is even greater when this knowledge is accompanied by imperfect, incomplete, and uncertain data.

Based on properly worked, historically situated, relevant, and paraphrased clinical cases to ensure the anonymity of patients and allow the author's rhetorical freedom, as well as an elaborate use of clinical medicine, genetics, and especially epidemiology, the author draws attention to what he considers the key to the problem when announcing the laws: the reconciliation between knowledge (certain, fixed, perfect, concrete) and clinical wisdom (uncertain, fluid, imperfect, abstract).

For Mukherjee, the three laws that govern medicine include: 1) a strong intuition is much more powerful than a weak examination; 2) the normal ones teach us rules, the "outliers" teach us laws; and 3) for every perfect medical experiment, exists a perfect human bias. With his robust background in oncology, it is natural that he draws his attention to the genetic and molecular aspects of patients' problems. However, this does not prevent him from having a keen eye on the world around the patient.

The author ends his narrative by declaring that medicine is not limited by only three rules. With a peculiar, easy-to-understand but rigorous erudition, the author quotes Voltaire when referring to doctors: "They are men who prescribe medicines about which they know little, to cure diseases about which they know even less, in human beings about whom they know nothing." Mukherjee concludes by stating that the "youngest science is also the most human science", therefore a science of great complexity.

AUTHOR GUIDELINES

Journal title: **Annals of Olinda Medical School Acronym: afmo**

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SCOPE

The Journal Annals of Olinda Medical School reflects the thinking and commitment to the production of knowledge based on the social responsibility that we assume as protagonists, and as part of the Institutional Development Project of the Faculdade de Medicina de Olinda (FMO). Aiming to strengthen the inseparability of teaching, research and extension, in addition to consolidating quality education, anchored in scientific bases and ethical values, the journal was created in light of an editorial line committed to a sustainable world and focused on medicine as a profession with a strong social and humanized component.

The Journal Annals of Olinda Medical School - Health Social Responsibility, was created in 2018. Since then, it has been the official vehicle of the Olinda School of Medicine to support its principles, especially those related to encouraging research, teaching, and professional medical practices. It is an important instrument for disseminating knowledge, allowing exchange with other areas that favor medicine and the community, and enabling improvement of the standard care provided to the population. Since its inception, Anais FMO has faithfully complied with the requirements for biannual online and printed periodicity for scientific publication, following the recommendations of the International Committee of Medical Journal Editors (www.icmje.org) , which are commonly used in the areas of medicine and related sciences. Currently, Anais FMO is duly registered as a journal in the ISSN system. Articles are published in a continuous flow and all are free and open access, offered through the link https://afmo.emnuvens.com.br. By publishing their article in Anais FMO, authors transfer copyright to the journal and grant it the right of first publication. Manuscripts are submitted online through the platform, available at https://afmo.emnuvens.com.br/afmo/about/submissions.

POLICIES OF THE JOURNAL ANNALS OF OLINDA MEDICAL SCHOOL

Research Ethics Committee Approval

All publications submitted to the Annals of Olinda Medical School must have followed the research ethics recommendations of the Declaration of Helsinki and the standards of Resolution no. 466/2012 (http://conselho.saude.gov.br/resolucoes/2012/Reso466.pdf http://conselho.saude.gov.br/resolucoes/2016/Reso510.pdf) of Brazilian National Health Council. Studies that analyze aggregated data without identify- ing participants, such as those available in offi- cial databases in the public domain are exempt from research ethics committee approval.

Following the guidance of the National Research Ethics Commission, National Health Council, Ministry of Health (CONEP/CNS/MS), no institution is superior to the research ethics committee to analyze the nature of research proposals. The research ethics committee that approves the research must be registered with CONEP.

Research ethics committee must also ap- prove case reports, following the provision no. 166/2018, of the Research Ethics Committee/CONEP/CNS, (http://conselho.saude.gov.br/images/comissoes/conep/documentos/CARTAS/CartaCircular166.pdf).

Case reports involving cadaveric parts must also have a research ethics committee approv al. Reports that use parts from cadavers destined for medical schools or similar areas for teaching and research purposes, in addition to

ethical approval, must have authorization from the responsible institution to conduct the research.

It is mandatory to send a copy of the research ethics committee approval before submission.

Peer Review

Annals of Olinda Medical Schools recognizes that peer review is important in the publication process.

Therefore, we analyze the submitted manuscripts with ethics and maximum scientific rigor, following the steps below:

Every manuscript received is analyzed for suitability to the scope of the journal, its contribution to knowledge advancement, its originality, the methodological rigor with which the study was conducted, and the adequacy of the conclusions in relation to the results presented. In addition, the formatting is evaluated according to the standards of the journal. If any inaccuracy is identified, the manuscript is returned to the corresponding author, indicating the necessary adjustment. Only manuscripts that meet all the criteria described in the "Author Guidelines" undergo peer review.

Peer review is performed by at least two reviewers with extensive competence to evaluate the manuscript. The entire process is double-blinded; that is, reviewers and authors do not know each other's identities.

The editorial decision is made based on the comments from the reviewers. It may follow one of the following outcomes: (1) rejection, (2) new submission chance by addressing the comments received, or (3) approval with or without changes.

Manuscripts falling under outcome (1), rejection, will be returned to the authors. In the case of outcomes (2) and (3), more than one round of review may be necessary. Conflicting opinions will have a third opinion requested or will undergo editorial arbitration. Failure by authors to comply with the review deadlines stipulated by the journal may result in the submission being archived. Approved manuscripts may receive layout changes as long as they do not alter the merit of the work.

The final editorial decision is recorded and is the responsibility of the editorial board. The manuscript content is the sole responsibility of the authors.

TYPES OF MANUSCRIPTS ACCEPTED FOR PUBLICATION

Original article: a full paper of a clinical or experimental investigation with unpublished research results (limit of 3,400 words, seven authors, and 30 references).

Integrative, systematic review, and me- ta-analysis: they should address topics of in- terest in health. Narrative reviews will not be accepted. Authors must include the study mo- tivation in the Introduction. Summary and ab- stract must be formatted as a single paragraph in a block format with up to 250 words (limit of 3,400 words, seven authors, and 45 referenc- es).

Short Communication: short communication of original research results. In general, short communications are leaner analyses with a brief discussion of the results (summary and abstract must be formatted as a single paragraph in a block format with up to 120 words; the manuscript must be up to 1,000 words with Introduction, Methods, Results, and Discussion sections; up to two tables/figures can be included in up to three pages combined; references are limited to six).

Case reports: description of clinical cases of interest due to their rarity, presentation, innovative diagnosis, or treatment (summary and abstract must be formatted as a single paragraph in a block format with up to 120 words; the manuscript must be up to 2,000 words with Introduction, Case Report, and Discussion sections; up to two tables/ figures can be included in up to three pages combined; references are limited to fifteen; limit of seven authors).

Experience reports: detailed description of a successful or unsucessful experience of an author or a team, which contributes to the discussion, exchange, and proposition of ideas for improving health care. It must include an introduction with a theoretical framework for the experience, objectives of the experience, methodologies used (including a description of the context and procedures), results, and final considerations. Summary and abstract must be formatted as a single paragraph in a block format with up to 120 words; the manuscript must have

up to 2,000 words and up to two tables/figures; limit of 15 references and seven authors).

Methodological paper and theoretical/ tech- nical essays: manuscripts that deal with tech- niques or theories used in epidemiological stud- ies or that portray an original clinical observation or description of technical innovations. Manu- script should be concise, limited to 1,500 words, five references, two illustrations, four authors, summary and abstract in must be formatted as a single paragraph in a block format with up to 120 words.

Critical review: restricted to a book or film in the medical field and related sciences. Argumentative manuscript in which the author describes and analyzes a social production aiming to influence his readers by recommending the work for its qualities or rejecting it for its flaws. It must be presented as follows: (1) presentation - summary of the work analyzed with both technical information and information about the book or film content; (2) analysis – interpretation and analysis of the work highlighting its main points, whether positive or negative, and the critical analysis from the author; (3) conclusion - opinion on the work, resuming the main points analyzed (up to 1000 words and two authors);

Letters to the Editor: comments from readers on works published in the Annals of Olinda Medical School (500 to 700 words).

Editorial: It is the initial article of a volume and is generally requested by the Chief and Deputy Editors to guests with recognized technical and scientific skills.

The word count includes Introduction, Methods, Results, and Discussion (title page, summary, abstract, references, tables, and figures are not included in the word count).

Manuscripts submitted must be intended exclusively for the Annals of Olinda Medical School, and simultaneous submission to another jour nal is prohibited. The information and concepts presented in the manuscript, as well as the ve- racity of the research content, are the sole re- sponsibilities of the author(s).

FORMATTING

Manuscripts are accepted in Portuguese or English and must have an abstract in the original language of the manuscript and English. Manuscripts in English must have an abstract in English and Portuguese.

Manuscripts must be sent in Word, dou- ble-spaced, and Arial font size 12. Do not use line breaks. Do not use force manual hyphenations. The full term must follow abbreviations cited for the first time in the document. Title and abstract must not contain abbreviations.

TITLE PAGE

Title of the manuscript in Portuguese and English (up to 25 words for each title);

Author information (full name, email, ORCID, affiliation, city, state, and country — do not include title and position);

Indication of the corresponding author, with their full address and email;

Conflicts of interest, in accordance with the Resolution of the Federal Council of Medicine (CFM) no. 1595/2000, which prohibits the publication of works for advertisement purposes of medical products and equipment, available at https://sistemas.cfm.org.br/normas/visualizar/resolucoes/BR/2000/1595. Conflicts of interest must be presented as follows: “The author(s) (name them) received financial support from the private company (mention its name) to conduct this study”. If there are no conflicts of interest, the authors must declare: “The authors have no conflicts of interest to declare”.

Source of financing, stating whether public or private; if there is none, mention that the study was not funded;

Number of the Certificate of Presentation for Ethical Assessment (CAAE) or number of Research Ethics Committee approval;

Authors contribution to the manuscript.

On the following pages, always starting on a new page, the following sections must be presented:

SUMMARY AND ABSTRACT

Summaries must comply with the recommenda- tions for each category of manuscript. In gen- eral, it must contain up to 250 words and be in structured format, covering the sections Ob- jective, Methods, Results, and Conclusion. The same rule applies to the abstract.

Authors must include a minimum of four and a

maximum of six keywords in both English and Portuguese regardless of the language in which the manuscript was submitted.The key- words must be standardized according to the Health Sciences Descriptors (DeCS), available at http://decs.bvs.br/.

REFERENCES

References must be numbered consecutively according to the first mention in the manuscript and using superscript Arabic numerals in accordance with Vancouver style (www.icmje.org). The reference list must follow the numerical order of the manuscript, ignoring the alphabetical order of authors. Journal titles must follow the Index Medicus/Medline. The name of the first six authors must appear, followed by the expression et al. when this number is exceeded. Whenever available, the Digital Object Identifier (DOI) must be provided (see examples below). Personal communications, unpublished or ongoing work, citations from books, thesis, and dissertations should be avoided. The accuracy of references is the responsibility of the authors.

EXAMPLES

Reference to a journal publication:

Ng OT, Marimuthu K, Koh V, Pang J, Linn KZ, Sun J, et al. SARS-CoV-2 seroprevalence and transmission risk factors among high-risk close contacts: a retrospective cohort study. Lancet Infect Dis. 2021 Mar; 21(3):333-343. doi: 10.1016/S1473-3099(20)30833-1

Jardim BC, Migowski A, Corrêa FM, Azevedo e Silva G. Covid-19 no Brasil em 2020: impacto nas mortes por câncer e doenças cardiovasculares. Rev Saude Publica. 2022; 56:22. https://doi.org/10.11606/s1518-8787.2022056004040.

Reference to a World Health Organization Report

World Health Organization. Clinical Care for Severe Acute Respiratory Infection—Toolkit—Update 2022. Genebra: World Health Organization; 2022.

Reference to electronic documents

Brasil. Casos de aids notificados no SINAN, declarados no SIM e registrados no SISCEL/SICLOM, segundo capital de residência por ano de diagnóstico. Brasil, 1980-2021 [Internet]. 2021 [acessado em 12 abr. 2022]. Available at: http://www2.aids.gov.br/cgi/deftohtm.exe?tabnet/br.def

FIGURES AND TABLES

Figures and tables must be inserted at the end of the manuscript, followed by their respective captions. Submission in separate files is not permitted. There must be page breaks between each one, respecting the maximum number of three pages for tables and figures combined. Do not format tables using the TAB key.

Figures must be up to 15 cm wide in Portrait orientation and 24 cm wide in landscape orientation and be presented within the requested margin (Normal Word setting). Colored figures are accepted. Figures must be provided in high resolution, plots in editable format, and tables, equations, charts, and flowcharts must be sent in an editable file (Word or Excel), never as an image.

CONTACT METHODS

Physical address: R. Dr. Manoel de Almeida Belo, 1333. Bairro Novo, Olinda, PE, Brazil. Zip code: 53030-030.

Phone: +55 81 3011–5454

Website: https://afmo.emnuvens.com.br/afmo

E-mail address: anaisfmo@fmo.edu.br