ISSN 1415-6725
Número
69
mar/abr 2024

PUBLICAÇÃO OFICIAL DA **SBC**

REVISTA DA SOCIEDADE BRASILEIRA DE CANCEROLOGIA

Sociedade Brasileira de Cancerologia

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www.sbcancer.org.br
Reconhecida de utilidade pública federal:
Decreto nº 73.729 de 4 de março de 1974
CNPJ: 13.525.266/0001-08

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EDITORIAL

Revista da Sociedade Brasileira de Cancerologia

A Sociedade Brasileira de Cancerologia, através das suas publicações, procurou sempre estabelecer um caminho acadêmico no mundo complexo do mosaico oncológico. Neste número histórico, a Revista SBC alcança o processo da indexação, concretizando o seu reconhecimento tecno científico entre seus pares, na busca de novos espaços multidisciplinares. Assim, o seu futuro abre principalmente desafios fundamentais que envolvem o binômio Saúde x Doença, e em especial o Câncer.

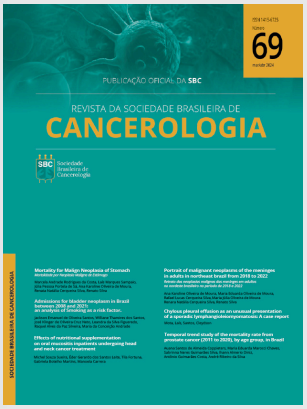
A revista continuará seguindo a velocidade dos conhecimentos nesta área, buscando conciliar a pesquisa com os pilares da bioética. A indexação de uma Revista científica representa um espaço de valor inestimável para reunir artigos da especialidade oncológica visando encontrar novos significados terapêuticos, desde a prevenção primária até a quaternária. A versão on-line da Revista também pode ser extremamente vantajosa, pois a velocidade das publicações sempre é maior do que a impressa.

Assim, este novo patamar cientifico, fruto do esforço de todos que trabalharam até o presente, será sem dúvida, potencializado para alcançar novos objetivos científicos fundamentais da Sociedade Brasileira de Cancerologia.

André M. Perdicaris, TCBC, SBC, FACS
Vice Presidente da Sociedade Brasileira de Cancerologia

Fundada em 25 de julho de 1946, sendo a mais antiga entidade de cancerologia da américa latina e uma das que se mantém em atividade na luta contra o câncer há mais tempo em todo mundo.

Sociedade Brasileira de Cancerologia



PUBLICAÇÃO OFICIAL DA SOCIEDADE BRASILEIRA DE CANCEROLOGIA, COM A PARTICIPAÇÃO DA SOCIEDADE BRASILEIRA DE PSICO-ONCOLOGIA

ISSN 1415-6725
Número 69
mar/abr 2024

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SUMÁRIO

ARTIGO ORIGINAL I *ORIGINAL ARTICLE*

Mortality for Malign Neoplasia of Stomach

Mortalidade por Neoplasia Maligna de Estômago

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RESUMO

Introdução: Neoplasia maligna de estomago é uma das principais causas de morte relacionada à neoplasias malignas. No Brasil é a terceira causa de câncer no sexo masculino e a quinta entre as mulheres. Esse câncer tem pico de incidência entre 50 e 70 anos, com interferência de diversos fatores ambientais, genéticos e de estilo de vida, caracterizando-o como complexo e multifacetado. **Objetivo**: Investigar a mortalidade por neoplasia maligna de estomago, examinando as tendências, os fatores de risco, os avanços no diagnóstico, na prevenção e no tratamento no período de janeiro de 2018 a fevereiro de 2023. **Métodos**: Estudo ecológico, retrospectivo, de séries temporais. Os dados foram obtidos através do Departamento de Informática do Sistema Único de Saúde (DATASUS). As variáveis consideradas foram: sexo raça, ano, faixa etária entre 30 e 69 anos e Unidade Federativa (UF) de residência e modalidade terapêutica. Foi dispensada a apreciação pelo Comitê de Ética em Pesquisa por serem utilizados dados públicos. **Resultados**: Entre o período de janeiro de 2018 a fevereiro de 2023, foram observados 3203 óbitos por neoplasias malignas de estomago em adultos no nordeste brasileiro. Quanto ao sexo, o masculino constitui a maioria (59,02%, n=1488). Na faixa etária, nota-se predominância de pessoas com 60 a 69 anos (42,36%, n=1357). No quesito cor/raça, 82,74% (n+2086) correspondiam aos óbitos na raça parda. Ao considerar a UF de residência dos pacientes, percebeu-se a maioria das notificações dos casos na Bahia (24,91%, n=798). **Conclusão**: Verificou-se prevalência de casos no sexo masculino, na faixa etária de 60 a 69 anos, de raça parda e no estado da Bahia.

Palavras-chaves: Neoplasia maligna de estômago; câncer gástrico; tratamento de câncer.

ABSTRACT

Introduction: Stomach neoplasm is one of the types of most common cancers and has a high mortality due to hard early diagnosis. The first symptoms are inespecific, with an incidence apex between 50 to 70 years old. In Brazil, gastric cancer is the third cause of cancer in males and the fifth in females. **Objectives**: Trace the epidemiological profile of the patients with malignant stomach neoplasm who deceased from January 2018 to February 2023 in the brazilian Northeast. **Methods**: This is a retrospective research, on a temporary series, done using the data of the Statistics Department of the Unified Health System (DATASUS-Tabnet), using data related to stomach câncer deaths, in people with 30 to 69 years old, from January 2018 to February 2023 in brazilian northeast. The variables selected were: sex, age, and auto-declared race. The Google Scheets program was used to table and evaluate the data. The research dismisses the approval by the Ethical Committee due

Recebido: 13/12/2023
Aprovado: 28/12/2023

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DOI: 10.29327/258045.31.69-1

to the use of public data. **Results**: Between January 2018 and February 2023, was evaluate 2521 deaths. At the evaluation by sex, 59,02% of deaths were in males (n=1488). About race, 82,74% (n=2086) correspond to deaths in mixed race. Concerning age, 42,36% (n=1357) of cases were between 60 to 69 years old. **Conclusion**: After the comparative evaluation of the data, evidenced that mortality by malignant stomach neoplasm is prevalent in mixed race males between 60 to 69 years old.

Keywords: Stomach neoplasms; Stomach; Antineoplastic protocols.

INTRODUCTION

Gastric cancer, also known as malignant stomach neoplasia, is a matter of significant public health concern due to its high mortality rate, largely associated with the difficulty of early detection. This type of cancer stands out not only for its considerable global incidence but also for the significant impact it exerts on morbidity and mortality.[1]

According to global cancer statistics, gastric cancer is one of the leading causes of death related to malignant neoplasms, contributing to a substantial portion of the global burden of oncological diseases. In Brazil, gastric cancer ranks as the third most common cancer in males and the fifth in females. The initial symptoms are discreet and nonspecific, with a peak incidence between the ages of 50 and 70.[2]

Furthermore, the prevalence of gastric cancer varies considerably worldwide, with higher incidence observed in some regions, suggesting the influence of environmental, genetic, and lifestyle factors in the etiology of the disease. This heterogeneity in incidence also extends to population groups within the same country, making gastric cancer a complex and multifaceted challenge for public health and clinical research.[3]

Therefore, this scientific article aims to investigate mortality due to malignant stomach neoplasia, examining trends, risk factors, advances in detection and treatment, as well as the importance of prevention programs. A comprehensive understanding of this cancer is crucial for improving clinical management, reducing mortality, and developing effective prevention strategies. This study aims to outline the epidemiological profile of patients with malignant stomach neoplasia who died in the Northeast of Brazil from January 2018 to February 2023.

METHODOLOGY

Ecological, retrospective, time series study. In ecological studies, both exposure and disease occurrence are determined for groups of individuals. In this type of study, there is no information about individual exposure to the disease, but rather information about the population as a whole. One of its advantages is the ability to examine associations between exposure and disease at the collective level. On the other hand, while an ecological association can correctly reflect an association between the disease and exposure, the possibility of ecological bias is always considered limited compared to other types of studies such as cross-sectional, case-control, or prospective cohort studies.

The hospital morbidity information, available in the SIH/SUS (Hospital Information System of the Unified Health System) and provided by the Department of Informatics of the Unified Health System (DATASUS), comes from the Hospitalization Authorization Forms (AIH) filled out in public hospitals and consolidated by municipal and state health departments.

Data on deaths due to malignant stomach neoplasia were obtained from DATASUS for individuals aged 30 to 69 years in the Northeastern states of Brazil (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe) from January 2018 to February 2023. The selected variables were gender (male and female), age group (30-39, 40-49, 50-59, 60-69 years), and self-declared race (white, brown, yellow, black, no information). Spreadsheets were created for data processing and analysis using Microsoft Excel Office, 2007 version.

The study did not require ethical approval from the Research Ethics Committee as it used publicly available data from the DATSUS-Tabnet website and did not directly involve living beings, whether animals or humans.

RESULTS

Between January 2018 and February 2023, data from 3,203 deaths due to malignant stomach neoplasia were analyzed. Out of the 3,203 deaths, 1,488 (46.45%) were male, while 1,033 (32.25%) were female. The rest were reported as unknown. These data can be seen in **Figure 1**.

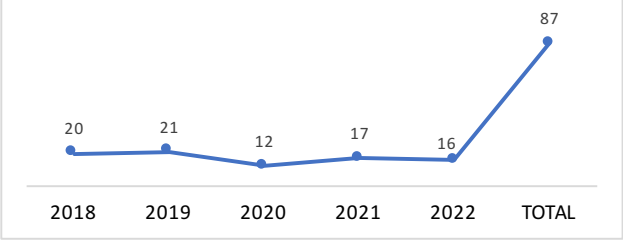

Figure 1: Number of deaths due to malignant stomach neoplasia by gender in the Northeast, from January 2018 to February 2023

SOURCE: Datasus. Teresina-PI, 2023.

In the analysis for the year 2018, there were 591 deaths (18.45%), with Bahia and Pernambuco showing the highest number of deaths. In 2019, there were 657 deaths (20.51%), representing the highest percentage for the period studied. In 2020, there were 580 deaths due to stomach neoplasia (18.10%). In the analysis for the year 2021, there were 646 deaths (20.16%), making it the second year with the highest mortality rate due to stomach neoplasia in the study period. In 2022, 606 deaths were reported (18.91%). In the last year analyzed, January and February 2023, 123 deaths (3.8%) due to stomach neoplasia were reported. The distribution of deaths by year can be seen in **Figure 2**.

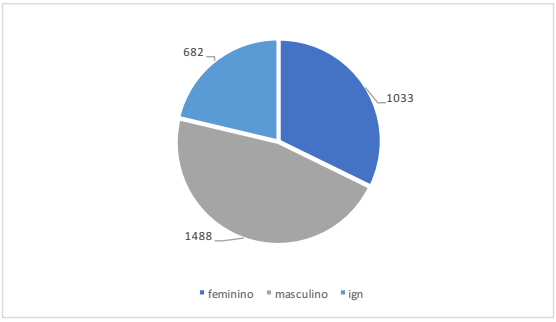

Figure 2: Number of deaths due to malignant stomach neoplasia by processing year in the Northeast, from January 2018 to February 2023

SOURCE: Datasus. Teresina-PI, 2023.

Regarding the distribution of deaths by race, 203 (6.33%) were white, 178 (5.55%) were black, 2,086 (65.12%) were brown, 53 (1.65%) were yellow, and 1 (0.03) were of indigenous race. The rest had no information about their race. The representation of these data can be found in **Figure 3**.

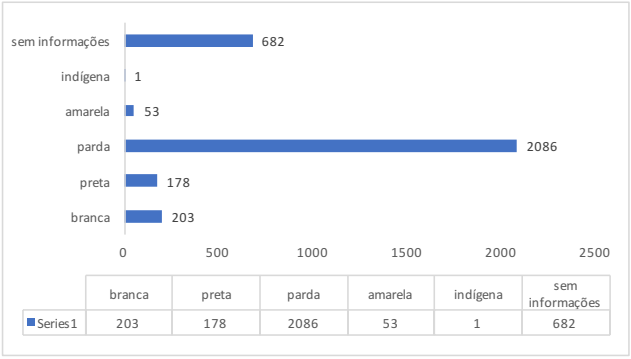

Figure 3: Number of deaths due to malignant stomach neoplasia by race in the Northeast, from January 2018 to February 2023

SOURCE: Datasus. Teresina-PI, 2023.

Finally, in terms of age distribution, it was observed that, during the study period, the age group of 60 to 69 had the highest number of deaths due to malignant stomach neoplasia, accounting for 1,357 (42.36%). In contrast, the age group of 30 to 39 had only 271 (8.46%) cases. All age groups and their respective numbers of deaths can be studied using **Figure 4**.

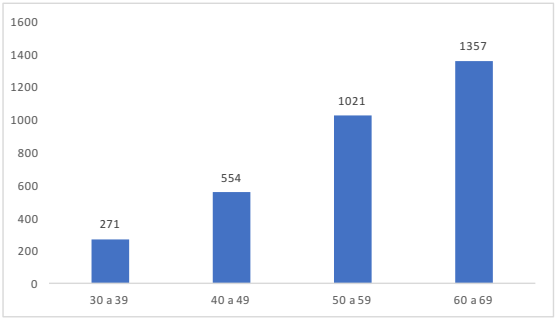

Figure 4: Number of deaths due to malignant stomach neoplasia by age group in the Northeast, from January 2018 to February 2023

SOURCE: Datasus. Teresina-PI, 2023.

DISCUSSION

The analysis of data collected between January 2018 and February 2023 provides valuable information about the studied deaths. Interpreting these data is essential for understanding the dynamics of mortality in a specific population. The prevalence of the disease is still significant, and Brazil continues to report a considerable number of new cases annually.[4]

In terms of gender, a significant proportion of deaths were observed among males, accounting for 46,45% of the total deaths analyzed. This result aligns with previously observed epidemiological patterns, where men tend to have higher mortality rates compared to women for various health conditions, including cancer-related causes. However, for a more comprehensive understanding, additional analyses are crucial to assess whether differences in exposure patterns or specific risk factors are contributing to this gender disparity.[5]

Regarding race/ethnicity, the results indicate that a substantial portion of deaths, specifically 65,12%. This result suggests a possible inequality in the distribution of deaths concerning race/ethnicity, with the brown population being more affected. However, it's important to remember that the association between race/ethnicity and health is complex and multifaceted, involving socio-economic factors, access to healthcare, and other social determinants.

Therefore, these results underscore the need for further investigations to better understand the underlying factors contributing to this disparity.[6]

As for age, it is notable that 42.36% of deaths occurred in the age group of 60 to 69 years. This finding is relevant as it suggests a concentration of deaths in this age group, indicating a possible trend associated with the aging of the population. Additionally, it is important to explore whether factors such as the presence of comorbidities or specific characteristics of the elderly population may be contributing to this pattern. This information can guide the allocation of resources and prevention strategies aimed at specific age groups.

CONCLUSION

After a comparative analysis of the data, among the 3,203 deaths, it was observed that mortality due to malignant stomach neoplasia is prevalent among brown males aged 60 to 69 and was highest in 2019. It is evident that mortality is not early but late, predominantly affecting the elderly population. Therefore, it is in this age group and this patient profile (elderly brown males) that public health policies should be focused, whether for early diagnosis or not delaying proper treatment.

REFERENCES

1. Guerra MR, Bustamante-Teixeira MT, Corrêa CSL, et al. Magnitude e variação da carga da mortalidade por câncer no Brasil e Unidades da Federação, 1990 e 2015. Revista Brasileira de Epidemiologia, v. 20, n. Supl. 1, p. 102-115, mai. 2017.

2. Barbosa IR, Souza DL, Bernal MM, CCC I. Cancer mortality in Brazil: Temporal Trends and Predictions for the Year 2030. Medicine (Baltimore) 2015 Apr; 94(16): e746.

3. Marinho F, Passos VMA, França EB. Novo século, novos desafios: mudança no perfil da carga de doença no Brasil de 1990 a 2010. Epidemiol Serv Saúde 2016 Dec; 25(4): 713-24.

4. Azevedo e Silva G, Gamarra CJ, Girianelli VR, et al. Tendência da mortalidade por câncer nas capitais e interior do Brasil entre 1980 e 2006. Rev Saúde Pública 2011; 45(6): 1009-18.

5. Ferlay J, Soerjomataram I, Dikshit R, et al. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. Int J Cancer 2015 Mar 1; 136(5): E359-86.

6. Conceição MBM, Boing AF, Peres KG. Time trends in prostate cancer mortality according to major geographic regions of Brazil: an analysis of three decades. Cad Saúde Pública 2014; 30(3): 559-66.

7. Malta DC, Abreu DM, Moura LD, et al. Trends in corrected lung cancer mortality rates in Brazil and regions. Rev Saúde Pública 2016 Jun 27; 50: 33

ARTIGO ORIGINAL I *ORIGINAL ARTICLE*

Admissions for bladder neoplasm in Brazil between 2008 and 2021: an analysis of Smoking as a risk factor.

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ABSTRACT

This epidemiological study analyzed hospital admissions due to Bladder Cancer (BC) in Brazil from 2008 to 2021, exploring the relationship between smoking and this neoplasm. BC poses a significant threat to global public health, is more common in men, and is often diagnosed late due to nonspecific symptoms. The study revealed 193,381 BC admissions, with over 70% occurring in men. There was a significant correlation between smoking and BC admission rates, indicating that states with a higher prevalence of smokers, such as Rio Grande do Sul, had higher admission rates. States with lower smoking rates, like Pará, had lower BC admission rates. These findings emphasize the need for effective prevention policies and awareness campaigns, aiming not only for early diagnosis but also for reducing smoking to decrease BC admissions.

Keywords: Neoplasms, Urinary Bladder, Tobacco Use Disorder, Epidemiology.

INTRODUCTION

The bladder is the organ of the urinary system responsible for storing urine after the production process in the kidneys. Furthermore, the contraction of the bladder detrusor muscle, controlled by the parasympathetic nervous system, promotes the elimination of urine to the external environment through the urethra[1]. Histologically, this organ comprises a mucosa, a muscular layer, and an adventitia[2]. The mucous layer is covered by a transitional epithelium or urothelium, which is constantly renewed by mitotic activity, which promotes disordered growth, increasing the possibility of tumor development[3].
In the world, Bladder Cancer (BC) is the 9th most common, ranking 13th in annual cancer deaths, thus representing a significant threat to public health[4]. Concerning distribution between the sexes, it is predominant in men, being the 7th most common cancer in men worldwide. Regarding histological subtypes, the most common is urothelial carcinoma, responsible for approximately 90% of cases[5].

The main signs of this neoplasm are dysuria, hematuria, and urinary frequency[3,5]. However, the low specificity of these signs contributes to a late diagnosis in many cases, which raises the alarm for further investigation in patients who present these signs[3,6,7].

Recebido: 13/12/2023
Aprovado: 28/12/2023

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Bladder cancer investigation is not restricted to analyzing symptoms but also risk factors[6,8]. In this sense, lifestyle habits, such as smoking and work occupation, stand out in their association with bladder cancer. Therefore, this article, when analyzing such factors, emphasizes smoking as one of the leading lifestyle habits that predispose to BC[9]. Given this, in the medical professional's complete assessment of a patient with suspected bladder neoplasia, research into these factors is essential for the diagnostic investigation. Understanding these associations plays a crucial role in the early diagnosis and effective treatment of this condition, directly impacting patients' quality of life.

JUSTIFICATION AND OBJECTIVES

The objective of this study is to analyze the relationship between active users of tobacco products and the rates of hospital admissions for BC per 100 thousand inhabitants in Brazilian states between 2008 and 2021. By better understanding this complex disease and its risk factors, It is possible to move towards more efficient diagnostic methods, more effective treatments, and, ultimately, a better quality of life for patients affected by this condition.

METHODS

That is a cross-sectional epidemiological study whose data were obtained from the Datasus database and information from the National Health Survey (PNS) on the Brazilian Institute of Geography and Statistics (IBGE) platform for 2019.

Initially, data regarding the rates of hospital admissions for Bladder Cancer in Brazilian states between 2008 and 2021 were collected in Datasus. After this collection, for comparison purposes, the distribution of consumption of tobacco products among the population of each federative unit was analyzed.

In the third stage, the data obtained were tabulated in the Microsoft Excel 2016 program, where the rates and measurements of the linear regression test (Pearson correlation coefficient and p-value) were calculated. The research was exempt from approval by the Research Ethics Committee (CEP).

RESULTS

During the period studied, there were 193,381 hospitalizations for malignant bladder neoplasia in Brazil. The analysis showed that more than 70% of those admitted were male (n=136,985), while 56,396 were women. Regarding the age groups affected, 147,334 cases were over 60 years of age, corresponding to 76.18% of all hospitalizations in the country in the period analyzed. Furthermore, 1,667 hospitalizations were reported in individuals up to 24 years of age, corresponding to 0.86% of total cases.

When analyzing the race/color variable, around 53% of cases affect the white population (n= 102,767), followed by mixed race (n= 50,826), black (n= 7,357), yellow (n= 1,824) and indigenous (n = 47); It is worth noting that 30,560 hospitalizations do not have information regarding color/race.

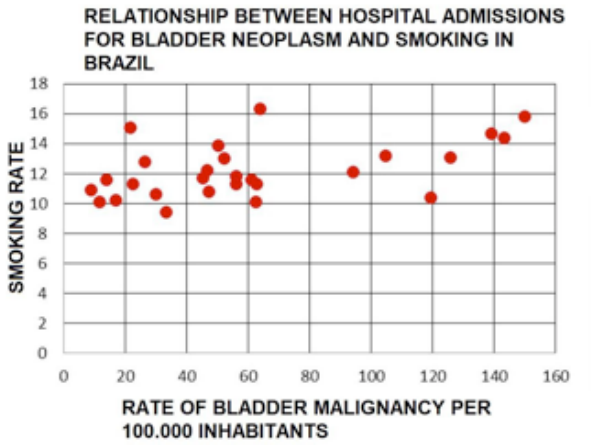
Among the Brazilian states, according to Table 1, the three with the highest rates of hospitalizations per 100 thousand inhabitants were Rio Grande do Sul (n= 149), São Paulo (n= 143), and Paraná (n= 139). These states are among the five with the highest smoking rates in the country, a ranking led by Mato Grosso do Sul with 16.3% of smokers, followed by Rio Grande do Sul (15.8%), Acre (15.1%), Paraná (14.7%) and São Paulo (14.4%).

On the other hand, the states with the lowest percentages of smokers were Sergipe (9.4%) and Pará (10.1%), both presenting a significantly lower number of hospitalizations for bladder cancer than the three states that led the analysis: Sergipe n = 33 and Pará n= 11.

Table 1: Number of hospitalizations for Bladder Cancer by states in Brazil.

State	Cases / 100.000	State	Cases / 100.000
Acre	21,58	Pará	11,67
Alagoas	30,14	Paraíba	56,07
Amapá	8,82	Paraná	139,10
Amazonas	16,85	Pernambuco	62,80
Bahia	62,64	Piauí	45,22
Ceará	46,62	Rio de Janeiro	94,29
Distrito federal	61,21	Rio Grande do Norte	56,17
Espirito Santo	119,44	Rio Grande do Sul	149,86
Goiás	50,19	Rondônia	47,26
Maranhão	22,60	Roraima	13,94
Mato Grosso	52,27	Santa Catarina	125,89
Mato Grosso do Sul	63,96	São Paulo	143,36
Minas Gerais	104,67	Sergipe	33,47
		Tocantins	26,54

The linear regression test revealed a significant correlation between the percentage of users of tobacco products and hospitalization rates for BC (r=0.496 and p= 0.008), as shown in **Graph 1**.



Graph 1: Correlation between smoking and hospital admissions for malignant bladder neoplasia in Brazil.

DISCUSSION

The role of tobacco in the carcinogenesis of bladder neoplasms is well reported in the literature, with smoking being one of the main risk factors for the disease10. This association is supported by the positive correlation found in the present study when comparing hospitalization rates for BC with the percentage of smokers in Brazilian states.

The epidemiological distribution of neoplasia in the Brazilian population agrees with other studies in demonstrating an increase in the number of hospitalizations associated with aging, with most cases occurring above 60 years of age[11]. Furthermore, the low percentage of hospitalizations in individuals up to 24 years of age shows the rarity of the disease in children and young adults[11]. Regarding the race variable, the higher incidence of BC in the white population of Brazil is also observed in a study that analyzed the distribution of the disease in the American population, showing an increased risk in whites when compared to other ethnic groups[12].

Analysis of the incidence of Bladder Cancer in Brazilian states demonstrates that other risk factors, in addition to smoking, are related to the disease. This information becomes apparent when looking at the state of Acre, which, despite being third in terms of smoking rates in the population, is only 23rd in terms of hospitalizations per 100 thousand inhabitants (n= 21). In addition, the state of Sergipe, which has the lowest percentage of smokers, has a higher hospitalization rate (n= 33) than states such as Tocantins (n= 26) and Maranhão (n=22), which have higher smoking rates, 12.8% and 11.3% respectively. In this sense, other risk factors related to this discrepancy are occupational exposure and incidence of other pathologies such as chronic cystitis[11].

CONCLUSION

In this cross-sectional epidemiological study, the rates of hospital admissions for Bladder Cancer (BC) in Brazil between 2008 and 2021 were analyzed, seeking to understand the correlation between the consumption of tobacco products and the incidence of this neoplasm. BC represents a significant threat to global public health, being more common in males and with most cases diagnosed late, making it essential to identify risk factors, with smoking being the most relevant.

By observing the significant correlation between the percentage of users of tobacco products and hospitalization rates for BC, the direct association between smoking and the increase in hospitalizations for BC is emphasized, demonstrating the need for more effective prevention policies and campaigns to support the cessation of tobacco consumption. Finally, this study highlights that understanding these associations is crucial not only for early diagnoses but also for guiding public interventions to reduce the incidence of Bladder Cancer in Brazil.

REFERENCES

1. Borden LS Jr, Clark PE, Hall MC. Bladder cancer. Curr Opin Oncol 2005;17:275-80.
2. Chalasani V, Chin JL Izawa JI. Histologic variants of urothelial bladder cancer and nonurothelial histology in bladder cancer. Can Urol Assoc J 2009;3:S193-8.
3. Câncer de bexiga: diagnóstico. Revista da Associação Médica Brasileira, v. 54, n. 2, p. 100–101, mar. 2008.
4. Jemal A, Murray T, Ward E, Samuels A, Tiwari RC, Ghafoor A, et al. Cancer statistics, 2005. CA Cancer J Clin 2005;55:10-30.
5. Borden LS Jr, Clark PE, Hall MC. Bladder cancer. Curr Opin Oncol 2005;17:275-80.
6. Messing, E. M., & Vaillancourt, A. (1990). Hematuria screening for bladder cancer. J Occup Med1990;32:838-45.
7. Grossman, H. B. (1998). New methods for detection of bladder cancer. Semin Urol Oncol1998;16:17-22.
8. Van Rhijn BW, van der Poel HG, van der Kwast TH. Urine markers for bladder cancer surveillance: a systematic review. Eur Urol 2005;47:736-48.
9. Fleshner N, Garland J, Moadel A, Herr H, Ostroff J, Trambert R, et al. Influence of smoking status on the disease-related outcomes of patients with tobacco-associated superficial transitional cell carcinoma of the bladder. Cancer 1999;86:2337-45
10. Cumberbatch MG, Rota M, Catto JWF, La Vecchia C. The Role of Tobacco Smoke in Bladder and Kidney Carcinogenesis: A Comparison of Exposures and Meta-analysis of Incidence and Mortality Risks. Vol. 70, European Urology. Elsevier B.V.; 2016. p. 458–66.
11. Daneshmand S. Epidemiology and risk factors of urothelial (transitional cell) carcinoma of the bladder [Internet]. 2023.
12. Schulz MR, Loomis D. Occupational Bladder Cancer Mortality Among Racial and Ethnic Minorities in 21 States. Vol. 38, American Journal of Industrial Medicine. 2000.

ARTIGO ORIGINAL I *ORIGINAL ARTICLE*

Effects of nutritional supplementation on oral mucositis in patients undergoing head and neck cancer treatment

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ABSTRACT

Head and neck cancer (HNC), includes oral cavity, larynx, pharynx and thyroid neoplasms. The current treatment depends on site and tumor staging, consisting of surgery, chemotherapy, radiotherapy or their association. In what concerns about chemotherapy, the patient may suffer with many changes on the oralcavity. Currently, oral mucositis (OM) is one of the most frequently associated manifestations on the chemoradiotherapy treatment, being characterized by erythema on the oral mucosa, which evolves to painful extensive ulcers covered by pseudomembranous plates. Their presence exerts direct influence on the nutritional status and is associated with physiological alterations. **OBJECTIVE**: This study has as main goal to analyze the effects of nutritional supplementation on the prevalence of OM in head and neck cancer patients undergoing chemoradiotherapy treatment. **MATERIALS AND METHODS**: A database search was conducted on National Library of Medicine, Biblioteca Virtual em Saúde (BVS), Literatura Latino Americana e do Caribe em Saúde (Lilacs) and the Scientific Electronic Library Online, using booleans operators "OR", "AND" and "NOT", associated with the key index words "MUCOSITIS", "SUPPLEMENT", "DIETARY SUPPLEMENT" and "NUTRITIONAL STATUS". Studies published between 2004 and 2023 were included. **RESULTS**: Nutritional supplementation did not show any effects on the prevalence of oral mucositis. However, it was revealed a potential attenuation effect on second and third mucositis stages. Another relevant finding is that, in some studies, a significant effect was noticed when supplementation was introduced early on oncological treatment. **FINAL CONSIDERATIONS**: Nutritional supplementation is an important supporting strategy on the oral mucositis treatment, because it has a direct influence on the patient's nutritional status.

KEY WORDS: Supplements, Dietary supplement, Nutritional status, Mucositis.

Recebido: 13/12/2023
Aprovado: 28/12/2023

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DOI: 10.29327/258045.31.69-3

INTRODUCTION

Head and neck cancer (HNC) is determined by tissue modifications of the oral cavity, larynx, pharynx, thyroid and all base of skull. There most common risk factors for its development are chronic smoking and alcohol consumption, as well as the Human PapillomaVirus (HPV) infection [1]. According to recent data published by GLOBOCAN (2020), the incidence of HCN will be 16,88 individuals for every 100.000 habitants on the world, being the 5th most common sort of cancer (2). In Brazil, 2023 INCA database reveals that oral cavity neoplasms are the 5th most incident among men, and, until 2025, 15.100 new cases will be diagnosed, 10.900 of which for men, and 4.200 for women. The estimation for the 2023 - 2025 triennium is that oral cavity cancer will be the 6th most recurrent cause among men [2,3].

A protein deficiency associated with micronutrients loss is a possible HNC treatment collateral effects[4]. Frequently, patients begin the treatment on nutritional risk due to advanced tumor staging, as well as a wide range of metabolic alterations that results from the tumor and its growing [5,6]. Besides that, along with the treatment, ageusia, xerostomia, oral mucositis (OM), nausea and vomiting can contribute to lower the food intake [7]. Oral mucositis in patients with HNC has an average incidence of 80%, which can increase depending on the type of treatment, reaching up to 90% if the patients are submitted to chemoradiotherapy [8-10]. Its development is variable, but it can happen on the 12th chemoradiotherapy session, remaining for some weeks after the last session of treatment [11, 12].

Due to being an extreme ulcerative condition, OM consists in one of the most important factors for reduction of food intake, which increases the difficulty to reach daily dietary calories, as well as macronutrients intake like protein, which is responsible for maintaining the corporal tissues [14]. On the other side, there is also a reduction on micronutrients intake, such as tocopherol (vitamin E), ascorbic acid (vitamin C), retinol (vitamin A) and cholecalciferol (vitamin D), that are indispensable for metabolic homeostasis and supports chemoradiotherapy treatment, which are responsible for modulate the immune system, attenuation of oxidative stress and hormonal modulation, as well as zinc and magnesium, that have antioxidant functions [15-17].

According to the last consensus of the European Society for Clinical Nutrition and Metabolism (ESPEN), the energetic intake for oncological patients must be of 25-30 kcal/kg/day, associated with a protein consumption of 1-1,5g/kg/day, aiming to reduce illness and chemoradiotherapy collateral effects [18]. Although malnutrition is associated with chemoradiotherapy treatment collateral effects, some studies express that low nutrition status influences on the severity of OM. It was observed that the reestablishment of micro and macronutrients supplementation improves the nutritional intake, attenuating OM [13,19]. Therefore, the objective of this study is to review the scientific literature on the nutritional supplementation impact on OM in patients undergoing head and neck cancer treatment.

MATERIALS AND METHODS

A narrative review of the scientific literature was conducted, based on published studies from 2004 to 2023, searched on the following databases: PubMed, Biblioteca Virtual em Saúde (BVS), Literatura Latino Americana e do Caribe em Saúde (Lilacs) and Scientific Electronic Library Online. The search was conducted using the following booleans operators “OR”, “AND” and “NOT”, associated to the following English descriptors: “Oral Mucositis AND Nutritional Status”, “Oral Mucositis AND Nutritional Deficiency”, “Oral Mucositis AND Food Intake”, “Oral Mucositis and Dietary supplement OR Oral Nutrition supplements” and “Oral Mucositis AND Supplementation”. The search was carried out from June 2022 until April 2023. The inclusion criteria were Clinical Trials, Systematic and Narrative Reviews in humans published in English and in Portuguese, that indicated the relationship of nutrition supplementation on OM. The exclusion criteria were animal studies, studies that did not have the theme as main objective and gray literature publications. Forty studies were included in total.

RESULTS AND DISCUSSION

OM is characterized by painful extensive ulcerative wounds which can result in dietary intake decline and consequent weight loss and malnutrition [20]. In a study with 33 HNC patients on chemoradiotherapy, that aimed to characterize the treatment’s side effects, patients who developed OM had a significant weight loss. The participants reported that pain was the primal cause for dietary intake reduction [21].

According to the World Health Organization (WHO), OM is classified in five (5) stages: grade 0 - absence of alterations; grade I - presence of erythema; grade II - presence of erythema, ulcers and solid feeding; grade III - ulcers and liquid feeding; and grade IV - not capable of oral intake, requiring enteral and parenteral support [13].

A clinical trial published by Stokman et al (2003) analyzed the oral microbiota selective elimination effects on radiotherapy induced OM. The study was composed by 65 individuals diagnosed with malignant tumors on the head and neck region, who were submitted to radiotherapy treatment. After randomiza-

tion, participants received pellets containing 2 mg of Polymyxin E, 1,8 mg of Tobramycin and 10 mg of Amphotericin B or placebo with the same sensorial characteristics. OM occurred in both groups, however, grade III and IV had a higher prevalence followed by a bigger weight loss ratio in the placebo group [22].

Furthermore, Porock et al (2004) tried to determine which factors were associated with wound healing reduction on wounds caused by radiation on oral mucosa of 51 patients undergoing HNC treatment. The authors evidenced that the patient nutritional status at the beginning of the treatment was associated with severe radiotoxicity on oral mucosa. In addition, the OM severity was correlated to patient's low nutritional status [23].

The study conducted by Wu et al. (2022) analyzed the relation between serum gastrin and OM in patients undergoing HNC radiotherapy. Forty-two (42) individuals were included and all developed OM. It was observed, however, that those with lower serum gastrin activity had higher incidence of grades III and IV of OM. As a result, the subjects in this condition had a significant weight loss. This data suggests that low digestion capacity may be another factor that can contribute to OM severity and nutritional status alterations [24]. Gastrin is a hormone which acts on stimulating chloridric acid secretion to food digestion and it is related to an increase of smooth muscle motility [25].

In the effort of analyzing photobiomodulation influence on nutritional status in patients with OM undergoing HNC radiotherapy treatment, Gobo et al. (2014) evaluated 63 individuals, divided in two groups: high potency unfocused laser treatment and the second group was treated with traditional medication, which included non-steroidal anti-inflammatory drugs, topic steroidal anti-inflammatory drugs and chlorhexidine. The study result showed that patients on photobiomodulation treatment had less reduction on body mass index (BMI). The author discusses that this effect is related to oral mucosa improvement when compared to traditional medication, therefore exerting influence on patient's dietary intake [26].

The study published by Song et al (2023) had as objective to analyze the nutritional status influence on radiotherapy's toxicity in 228 participants with nasopharynx cancer. It was observed that those patients with low nutritional status in the beginning of the treatment developed advanced OM grades [27]. The permanence on dietary intake reduction and OM grievance causes an unintentional weight loss, and, therefore, it can be a predictive factor for patient's non-survival [28,29]. Death is the worst consequence for patients with OM and may be related with dietary intake reduction (30). Prolonged reduction in nutrient intake during treatment causes malnutrition, culminating in the individual´s death [30,31].

One of the strategies for reducing nutritional risk caused by OM is the nutritional assessment, followed by individualized diet adjustment [32]. In reference to the ESPEN nutritional guideline of 2021, it is recommended 25 to 30kcal/kg/day of caloric intake for oncological patients [18]. On the other hand, Brazilian Society of Parenteral and Enteral Nutrition (BRASPEN) recommends 25 to 30kcal/kg/day for eutrophic patients, 30 to 35kcal/kg/day for malnourished individuals and 32 to 38kcal/kg/day for elderly and malnourished patients [33]. In what concerns protein intake both guidelines recommend 1 to 1,5g/kg/day [18,33]. However, there isn't a specific nutritional recommendation for patients who developed OM during treatment, therefore it is indicated that the conventional guidelines are used. Nonetheless most of the patients are not capable of achieving caloric and protein recommendations, and because of that it is necessary to add nutritional supplementation [18,34]. In addition, nutritional supplementation is capable of supporting OM's prevention and treatment through the use of zinc, vitamin E and glutamine [35].

Precocious nutritional intervention is a strategy which aims at the maintenance of nutritional status of the patient. Jiang et al (2018), in an effort to analyze nutritional supplementation effects on the nutritional status of 50 patients, randomized them in two groups. In the intervention group supplementation was carried out pre and intra treatment, comprising 402kcal, 18g of protein, 10g of fat and 54g of carbohydrates, and its consumption was fractionated during the day. In the other group no supplementation was offered. The authors demonstrated that the intervention group had attenuated weight loss and less severe grades of OM, although its prevention didn't occur [36].

Oral supplementation during oncological treatment has shown beneficial effects on attenuating OM and consequent nutritional risk reduction among these patients. In the study by Haranda et al (2016), the authors verified elementary diet supplementation impact on OM in HNC patients undergoing radiotherapy treatment.

The study was composed of 67 participants, who were randomized to the intervention group, which was supplemented and the control group, which was not supplemented.

The supplementation was composed of 80g, with 300 kcal, which was offered once along the day, during all the treatment period. The intervention group had attenuated OM grades, being associated with a higher treatment conclusion ratio. However, in the control group there was an increase in the prevalence of grades III and IV of OM and higher interruption treatment ratio [37].

Supplementation or elementary diet have clinical applicability in patients with some intake restriction

or difficulty on the nutrients absorption, consisting of free or hydrated (hydrolyzed) amino acids and a large amount of carbohydrates. Moreover, there is the addition of micronutrients and dietary fibers [38]. The effect of nutritional supplementation on preventing OM was evaluated by Tanaka et al. (2022), who published a systematic review with meta-analysis. They included studies that used 300 to 600 kcal of elementary supplementation in chemoradiotherapy HNC patients.

The study showed that regardless of the study design, patients supplemented with an elementary diet during the oncological treatment had lower OM grades as well as a lower nutritional risk [39].

With the aim of containing chemoradiotherapy toxicities some authors suggest that nutritional strategies must begin on the first day of treatment. Meng et al. (2019) analyzed the impact of precocious versus late nutritional intervention on chemoradiotherapy side effects of 78 HNC patients. The precocious intervention group was supplemented with a hypercaloric nutritional supplementation on the first day of treatment, while the late group was oriented to initiate the supplementation when the first symptoms began to appear. As an outcome, it was observed that in the late intervention group the participants had higher prevalence of grades III and IV OM, higher treatment interruption ratio and hospitalization events [40].

A study conducted by Su et al. (2023) investigated the effect of precocious supplementation in HNC patients undergoing chemoradiotherapy. In total, 161 patients were randomized in two groups. The first one had to take the supplementation before the treatment began, while the second group was oriented to start it on the first day of treatment. The authors demonstrated that pre and intra supplementation on oncological treatment promoted a reduction on OM severity, as well as a reduction on non-intentional weight loss and malnutrition risk [19]. Therefore, nutritional supplementation is a successful strategy on controlling OM and consequent reducing the side effects of lower dietary intake.

FINAL CONSIDERATIONS

The use of nutritional supplementation demonstrated the ability to attenuate OM evolution during chemoradiotherapy, figuring as a fundamental strategy for alleviating patient discomfort, reducing nutritional risk and increasing treatment conclusion ratio.

In addition, pre and intra supplementation had positive results demonstrating superior effect when compared to supplementation during treatment or when the patient has OM. In general, patients are responsible for paying for this sort of treatment, however in Brazil, the public health system has a number of supplements which can be obtained with medical or nutritional recommendation.

REFERENCES

1. Chaturvedi AK, Engels EA, Pfeiffer RM, Hernandez BY, Xiao W, Kim E,et al. Human papillomavirus and rising oropharyngeal cancer incidence in theUnited States. J Clin Oncol [Internet]. 2011 Nov 10 [cited 2023 Oct 25];29(32):4294–301. Available from: https://pubmed.ncbi.nlm.nih.gov/21969503/
2. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin [Internet]. 2021 May [cited 2023 Oct 25];71(3):209–49. Available from: https://pubmed.ncbi.nlm.nih.gov/33538338/
3. Ministério da Saúde Instituto Nacional de Câncer José Alencar Gomes da Silva Ministério da Saúde Instituto Nacional de Câncer. 2023;
4. Silver HJ, Dietrich MS, Murphy BA. Changes in body mass, energy balance, physical function, and inflammatory state in patients with locally advanced head and neck cancer treated with concurrent chemoradiation after low-dose induction chemotherapy. Head Neck [Internet]. 2007 Oct [cited 2023 Oct 25];29(10):893–900. Available from: https://pubmed.ncbi.nlm.nih.gov/17405169/
5. Bressan V, Stevanin S, Bianchi M, Aleo G, Bagnasco A, Sasso L. The effects of swallowing disorders, dysgeusia, oral mucositis and xerostomia on nutritional status, oral intake and weight loss in head and neck cancer patients: A systematic review. Cancer Treat Rev [Internet]. 2016 Apr 1 [cited 2023 Oct 25];45:105–19. Available from: https://pubmed.ncbi.nlm.nih.gov/27010487/
6. Dallacosta FM, Carneiro TA, Velho SF, Rossoni C, Baptistella AR. Avaliação nutricional de pacientes com câncer em atendimento ambulatorial. Cogit Enferm (Online) [Internet]. 2017 Nov 22 [cited 2023 Oct 25];22(4):1–6. Available from: https://fi-admin.bvsalud.org/document/view/m4hsr
7. Murphy BA. Advances in quality of life and symptom management for head and neck cancer patients. Curr Opin Oncol. 2009 May;21(3):242–7.
8. Reyes-Gibby CC, Wang J, Zhang L, Peterson CB, Do KA, Jenq RR, et al. Oral microbiome and onset of oral mucositis in patients with squamous cell carcinoma of the head and neck. Cancer [Internet]. 2020 Dec 1 [cited 2023 Oct 25];126(23):5124–36. Available from: https://pubmed.ncbi.nlm.nih.gov/32888342/
9. Maria OM, Eliopoulos N, Muanza T. Radiation-Induced Oral Mucositis.

Front Oncol [Internet]. 2017 May 22 [cited 2023 Oct 25];7(MAY). Available from: https://pubmed.ncbi.nlm.nih.gov/28589080/
10. Pulito C, Cristaudo A, Porta C La, Zapperi S, Blandino G, Morrone A, et al. Oral mucositis: the hidden side of cancer therapy. J Exp Clin Cancer Res [Internet]. 2020 Oct 7 [cited 2023 Oct 25];39(1). Available from: https://pubmed.ncbi.nlm.nih.gov/33028357/
11. Umeta M, West CE, Haidar J, Deurenberg P, Hautvast JGAJ. Zinc supplementation and stunted infants in Ethiopia: a randomised controlled trial. Lancet (London, England) [Internet]. 2000 Jun 10 [cited 2023 Oct 25];355(9220):2021–6. Available from: https://pubmed.ncbi.nlm.nih.gov/10885352/
12. Ertekin MV, Koç M, Karslio□lu I, Sezen O. Zinc sulfate in the prevention of radiation-induced oropharyngeal mucositis: A prospective, placebocontrolled, randomized study. Int J Radiat Oncol Biol Phys [Internet]. 2004 Jan 1 [cited 2023 Oct 25];58(1):167–74. Available from: https://pubmed.ncbi.nlm.nih.gov/14697435/
13. Bonan PRF, Lopes MA, Alves F de A, Almeida OP de. Aspectos clínicos, biológicos, histopatológicos e tratamentos propostos para a mucosite oral induzida por radioterapia: revisão da literatura. Rev Bras Cancerol [Internet]. 2005 Sep 30 [cited 2023 Oct 25];51(3):235–42. Available from: https://rbc.inca.gov.br/index.php/revista/article/view/1951
14. Crowder SL, Douglas KG, Yanina Pepino M, Sarma KP, Arthur AE. Nutrition impact symptoms and associated outcomes in postchemoradiotherapy head and neck cancer survivors: a systematic review. J Cancer Surviv [Internet]. 2018 Aug 1 [cited 2023 Oct 25];12(4):479–94. Availablefrom:https://pubmed.ncbi.nlm.nih.gov/29556926/
15. Prasad AS. Effects of zinc deficiency on Th1 and Th2 cytokine shifts. J Infect Dis. 2000;182(3 SUPPL. 1).
16. Nejatinamini S, Debenham BJ, Clugston RD, Mawani A, Parliament M, Wismer W V., et al. Poor Vitamin Status is Associated with Skeletal Muscle Loss and Mucositis in Head and Neck Cancer Patients. Nutrients [Internet]. 2018 Sep 5 [cited 2023 Oct 25];10(9). Available from:https://pubmed.ncbi.nlm.nih.gov/30189611/
17. Costa-Guda J, Corrado K, Bellizzi J, Saria E, Saucier K, Guemes- Aragon M, et al. Influence of Vitamin D Deficiency on Cyclin D1-Induced Parathyroid Tumorigenesis. Endocrinology [Internet]. 2023 Sep 23 [cited 2023 Oct 25];164(11). Available from: https://pubmed.ncbi.nlm.nih.gov/37694586/
18. Muscaritoli M, Arends J, Bachmann P, Baracos V, Barthelemy N, Bertz H, et al. ESPEN practical guideline: Clinical Nutrition in cancer. Clin Nutr [Internet]. 2021 May 1 [cited 2023 Oct 25];40(5):2898–913. Available from: https://pubmed.ncbi.nlm.nih.gov/33946039/
19. Su L, Lin QJ, Ma SQ, Song XR, Ye JR, Ni MS, et al. The effect of early oral nutritional supplements on improving nutritional outcomes and radiationinduced oral mucositis for nasopharyngeal carcinoma patients undergoing concurrent chemoradiotherapy. Head Neck [Internet]. 2023 [cited 2023 Oct 25];45(11). Available from: https://pubmed.ncbi.nlm.nih.gov/37642216/
20. Lalla R V., Peterson DE. Oral Mucositis. Dent Clin North Am [Internet]. 2023 May 29 [cited 2023 Oct 25];49(1 SPEC.ISS.):167–84. Available from: https://www.ncbi.nlm.nih.gov/books/NBK565848/
21. Rose-Ped AM, Bellm LA, Epstein JB, Trotti A, Gwede C, Fuchs HJ.Complications of radiation therapy for head and neck cancers. The patient's perspective. Cancer Nurs [Internet]. 2002 [cited 2023 Oct 25];25(6):461–9. Available from: https://pubmed.ncbi.nlm.nih.gov/12464838/
22. Stokman MA, Spijkervet FKL, Burlage FR, Dijkstra PU, Manson WL, De Vries EGE, et al. Oral mucositis and selective elimination of oral flora in head and neck cancer patients receiving radiotherapy: a double-blind randomised clinical trial. Br J Cancer [Internet]. 2003 Apr 7 [cited 2023 Oct 25];88(7):1012– 6. Available from: https://pubmed.ncbi.nlm.nih.gov/12671696/
23. Porock D, Nikoletti S, Cameron F. The relationship between factors that impair wound healing and the severity of acute radiation skin and mucosal toxicities in head and neck cancer. Cancer Nurs [Internet]. 2004 [cited 2023 Oct 25];27(1):71–8. Available from: https://pubmed.ncbi.nlm.nih.gov/15108954/
24. Wu C, Liu Y, Shi F, Chen F, Zhao Y, Zhao H. The relationship of serum gastrin-17 and oral mucositis in head and neck carcinoma patients receiving radiotherapy. Discov Oncol [Internet]. 2022 Dec 1 [cited 2023 Oct 25];13(1). Available from: https://pubmed.ncbi.nlm.nih.gov/36269422/
25. Danzer M, Jocic M, Samberger C, Painsipp E, Bock E, Pabst M-A, et al. Downloaded from journals.physiology.org/journal/ajpgi. Am J Physiol Gastrointest Liver Physiol [Internet]. 2004 [cited 2023 Oct 25];286:403–11. Available from: http://www.ajpgi.orgg403
26. Gobbo M, Ottaviani G, Perinetti G, Ciriello F, Beorchia A, Giacca M, et al. Evaluation of nutritional status in head and neck radio-treated patients affected by oral mucositis: Efficacy of class IV laser therapy. Support Care Cancer [Internet]. 2014 Feb 20 [cited 2023 Oct 25];22(7):1851–6. Available from: https://link.springer.com/article/10.1007/s00520-014-2155-x
27. Song X, Su L, Lin Q, Liu S, Zhang W, Hong J. Effect of nutritional status before radiotherapy on radiation-induced acute toxicities in patients with nasopharyngeal carcinoma. Head Neck [Internet]. 2023 Mar 1 [cited 2023 Oct 25];45(3):620–8. Available from: https://pubmed.ncbi.nlm.nih.gov/36600471/
28. Kubrak C, Olson K, Jha N, Jensen L, McCargar L, Seikaly H, et al. Nutrition impact symptoms: key determinants of reduced dietary intake, weight loss, and reduced functional capacity of patients with head and neck cancer before treatment. Head Neck [Internet]. 2010 Mar [cited 2023 Oct 25];32(3):290– 300. Available from: https://pubmed.ncbi.nlm.nih.gov/19626639/
29. Palmieri M, Sarmento DJS, Falcão AP, Martins VAO, Brandão TB, Morais-Faria K, et al. Frequency and Evolution of Acute Oral Complications in Patients Undergoing Radiochemotherapy Treatment for Head and Neck Squamous Cell Carcinoma. Ear Nose Throat J [Internet]. 2021 Sep 1 [cited 2023 Oct 25];100(5_suppl):449S-455S. Available from: https://pubmed.ncbi.nlm.nih.gov/31619067/
30. Shetty SS, Maruthi M, Dhara V, de Arruda JAA, Abreu LG, Mesquita RA, et al. Oral mucositis: Current knowledge and future directions. Dis Mon [Internet]. 2022 May 1 [cited 2023 Oct 25];68(5). Available from: https://pubmed.ncbi.nlm.nih.gov/34758917/
31. Shih A, Miaskowski C, Dodd MJ, Stotts NA, MacPhail L. A research review of the current treatments for radiation-induced oral mucositis in patients with head and neck cancer. Oncol Nurs Forum [Internet]. 2002 [cited 2023 Oct 25];29(7):1063–80. Available from: https://pubmed.ncbi.nlm.nih.gov/12183755/

32. Wei J, Wu J, Meng L, Zhu B, Wang H, Xin Y, et al. Effects of early nutritional intervention on oral mucositis in patients with radiotherapy for head and neck cancer. QJM [Internet]. 2020 Jan 1 [cited 2023 Oct 25];113(1):37–42. Available from: https://pubmed.ncbi.nlm.nih.gov/31432089/
33. Institucional A. DIRETRIZ BRASPEN DE TERAPIA NUTRICIONAL NO PACIENTE COM CÂNCER. 2019;34:2–32.
34. de Luis DA, de la Fuente B, Izaola O, Martin T, Cuellar L, Terroba MC. Clinical effects of a hypercaloric and hyperproteic oral suplemment enhanced with W3 fatty acids and dietary fiber in postsurgical ambulatory head and neck cancer patients. Nutr Hosp [Internet]. 2014 Nov 30 [cited 2023 Oct 25];31(2):759–63. Available from: https://pubmed.ncbi.nlm.nih.gov/25617560/
35. de Sousa Melo A, de Lima Dantas JB, Medrado ARAP, Lima HR, Martins GB, Carrera M. Nutritional supplements in the management of oral mucositis in patients with head and neck cancer: Narrative literary review. Clin Nutr ESPEN [Internet]. 2021 Jun 1 [cited 2023 Oct 25];43:31–8. Available from: https://pubmed.ncbi.nlm.nih.gov/34024533/
36. Jiang W, Ding H, Li W, Ling Y, Hu C, Shen C. Benefits of Oral Nutritional Supplements in Patients with Locally Advanced Nasopharyngeal Cancer during Concurrent Chemoradiotherapy: An Exploratory Prospective Randomized Trial. Nutr Cancer [Internet]. 2018 Nov 17 [cited 2023 Oct 25];70(8):1299–307. Available from: https://pubmed.ncbi.nlm.nih.gov/30633580/
37. Harada K, Ferdous T, Horinaga D, Uchida K, Mano T, Mishima K, et al. Efficacy of elemental diet on prevention for chemoradiotherapy-induced oral mucositis in patients with oral squamous cell carcinoma. Support Care Cancer [Internet]. 2016 Feb 1 [cited 2023 Oct 25];24(2):953–9. Available from: https://pubmed.ncbi.nlm.nih.gov/26248650/
38. Yamamoto T, Nakahigashi M, Umegae S, Kitagawa T, Matsumoto K. Impact of elemental diet on mucosal inflammation in patients with active Crohn's disease: cytokine production and endoscopic and histological findings. Inflamm Bowel Dis [Internet]. 2005 Jun [cited 2023 Oct 25];11(6):580–8. Available from: https://pubmed.ncbi.nlm.nih.gov/15905706/
39. Tanaka Y, Shimokawa T, Harada K, Yoshida K. Effectiveness of elemental diets to prevent oral mucositis associated with cancer therapy: A meta-analysis. Clin Nutr ESPEN [Internet]. 2022 Jun 1 [cited 2023 Oct 25];49:172–80. Available from: https://pubmed.ncbi.nlm.nih.gov/35623809/
40. Meng L, Wei J, Ji R, Wang B, Xu X, Xin Y, et al. Effect of Early Nutrition Intervention on Advanced Nasopharyngeal Carcinoma Patients Receiving Chemoradiotherapy. J Cancer [Internet]. 2019 [cited 2023 Oct 25];10(16):3650. Available from: /pmc/articles/PMC6636293/

ARTIGO ORIGINAL I *ORIGINAL ARTICLE*

Portrait of malignant neoplasms of the meninges in adults in northeast brazil from 2018 to 2022

Retrato das neoplasias malignas das meninges em adultos no nordeste brasileiro no período de 2018 a 2022

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RESUMO

Introdução: Meningiomas são causados pela multiplicação anormal de células da membrana aracnoide. Essas neoplasias constituem 2% de todos os meningiomas intracranianos, conhecidos por crescimento e invasão local agressiva e potencial para metástase. Esses tumores têm capacidade de infiltrar-se nos tecidos circundantes, comprometendo a função cerebral. **Objetivo**: Caracterizar o perfil epidemiológico de meningiomas em adultos na região Nordeste no período de 2018 a 2022. **Métodos**: Estudo epidemiológico, transversal, descritivo e quantitativo. Os dados foram obtidos do Departamento de Informática do Sistema Único de Saúde (DATASUS). As variáveis consideradas foram: sexo, faixa etária, Unidade Federativa de residência e modalidade terapêutica. Foi dispensada a apreciação pelo Comitê de Ética em Pesquisa por serem dados públicos. **Resultados**: No período de janeiro de 2018 a setembro de 2022, observou-se 87 casos de neoplasia das meninges em adultos no Nordeste. Quanto ao sexo, o feminino liderou (71%). Na faixa etária, predominou-se pessoas com 45 a 54 anos (43,04%). Considerando UF de residência, percebeu-se a maioria das notificações dos casos na Bahia (37,39%). Na modalidade terapêutica, 69,62% dos casos não possuem informações, e entre os registrados, a radioterapia se destacou (18,99%). **Conclusão**: Verificou-se prevalência de casos no sexo feminino, na faixa etária de 45 a 54 anos e no estado da Bahia. Ressalta-se que há escassez de dados acerca das modalidades terapêuticas no Nordeste. A ausência de notificação de tratamento representa um cenário que merece atenção na saúde pública, visando consolidar as informações para que melhor se promova a oferta de recursos terapêuticos.

Palavras-chave: Tumor cerebral, Câncer, Meninges.

ABSTRACT

Introduction: Meningiomas are caused by abnormal cell multiplication of the arachnoid. This neoplasm represent 2% of all intracranial menigiomas, known by growth and agressive local invasion and potencial to mestastase. These tumors have capacity to infiltrate in the adjacents tissues, compromising the brain function. **Objective**: Characterize the epidemiological function of menigiomas in adults in the Northeast of Brazil during the period of 2018 to 2022. **Methods**: Epidemiological, transversal, descritive and quantitative research. The data was collected at the Informatic Department of the Unique Health System (DATASUS). The variables choosen were: sex, age, Federa-

Recebido: 13/12/2023
Aprovado: 28/12/2023

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DOI: 10.29327/258045.31.69-4

tive Unit of residence and terapeutic modality. The research was dismissed by judgment of the Ethical Commitee due to being public data. **Results**: During the period of January 2018 to September 2022, it was observed 87 cases of meninge neoplasm in adults in Northeast. In relation to sex, females led (71%). In ages, predominates people from 45 to 54 years old (43,09%). Considering the federative unit of residence, it is noticed that the majority of the notifications was in Bahia (37,39%). In therapeutic modality, 69,62% of the cases don't have information, and in the registrated, the radiotherapy was emphasized (18,99%). **Conclusion**: The prevalence of cases is in females, in the age group of 45 to 54 years old, and the state of Bahia was verified. Highlight that are fewer data about the therapeutic modalities in the Northeast. The lack of notifications of the treatment represents a scenario that deserves attention in public health, aiming to consolidate the information to improve the promotion of therapeutic resources.

Keywords: Brain tumor; brain; meningioma.

INTRODUCTION

Malignant neoplasms of the meninges, also known as malignant meningiomas, are a condition of extreme clinical and scientific relevance. These tumors result from the abnormal proliferation of arachnoid membrane cells that line the central nervous system. They are characterized by their rarity, representing approximately 2% of all intracranial meningiomas. These tumors are notable for their rapid growth, aggressive local invasion, and the concerning possibility of metastasis, which means spreading to other parts of the body. Their ability to infiltrate surrounding tissues can cause significant damage and compromise brain function[1].

Malignant meningiomas, also referred to as anaplastic or Grade III meningiomas, are a rare and aggressive class of tumors that develop in the inner layers of the meninges. These thin layers of tissue play a crucial role in protecting the brain and spinal cord. Although malignant neoplasms of the meninges are relatively rare, their growing importance in the fields of oncology and neurology is undeniable. The complexity of diagnosis and the potential implications for neurological function and patients' quality of life make this condition a significant clinical challenge[2].

Meningiomas are classified into three grades based on their characteristics: Grade I, which are low-grade and more common tumors, growing slowly; Grade II, also known as atypical meningiomas, with a higher likelihood of recurrence after removal; and Grade III, anaplastic or malignant meningiomas, which exhibit rapid growth. Notable subtypes of these tumors include papillary and rhabdoid meningiomas. Malignant meningiomas often present as enhanced masses in the outer layer of brain tissue, with or without contrast enhancement. Furthermore, these tumors have the ability to invade brain tissue, further complicating treatment[3].

Although the cause of malignant meningiomas is not fully understood, exposure to radiation, especially in childhood, is the only known environmental risk factor for the development of these tumors. People with the genetic condition known as neurofibromatosis type 2 are at a higher risk of developing meningiomas. These tumors can spread to other areas of the central nervous system through cerebrospinal fluid (CSF), and in the case of Grade II meningiomas, they can invade surrounding tissue, including adjacent bone tissue[4].

A deep understanding of this condition is of paramount importance for improving early diagnosis, developing more effective therapies, and ultimately enhancing the quality of life of affected patients[5].

In this article, our objective is to comprehensively explore malignant neoplasms of the meninges, addressing clinical, diagnostic, therapeutic, and research aspects associated with this condition. Additionally, we will seek to characterize the epidemiological profile of malignant neoplasms of the meninges in adults in the Northeast region of Brazil during the period from 2018 to 2022, in order to contribute to a better understanding and more effective management of this complex and challenging disease.

METHODS

This study constitutes a cross-sectional, descriptive, and quantitative epidemiological research method aimed at analyzing data related to the incidence of a specific health condition. The data used for this study were obtained from the Department of Health Informatics of the Unified Health System (DATASUS).

Data collection encompassed a variety of aspects, including the number of recorded cases and diagnoses. The variables considered in this study included information about the gender of affected individuals, their age range, the Federative Unit (UF) of residence, and the therapeutic modality applied.

It is important to note that, given the public nature of the data used, this study did not require submission to an Ethics Research Committee for evaluation, as it did not involve sensitive or confidential information.

For the analysis and presentation of the collected data, Microsoft Excel software was used. This program enabled the performance of statistical analyses, the creation of graphs, and the visualization of results in a clear and informative manner. Thus, the methodology employed in this study provided a comprehensive and detailed approach to the analysis of the epidemiology of the health condition in question, offering valuable information for understanding and making decisions related to public health.

RESULTS

Between January 2018 and September 2022, 87 cases of malignant meningiomas in adults in the northeastern region of Brazil were observed, as shown in **Table 1**.

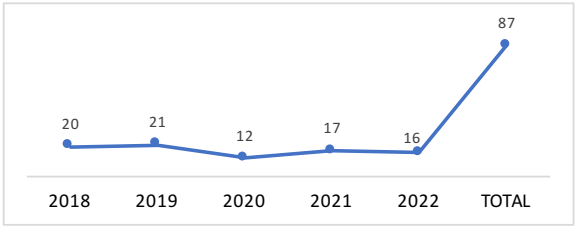
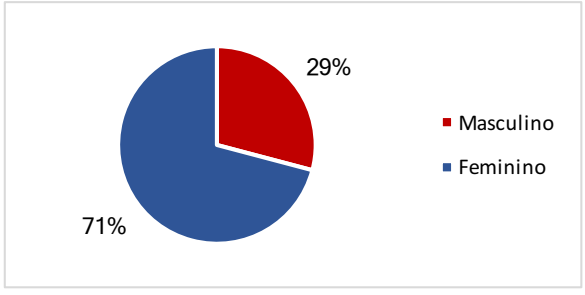


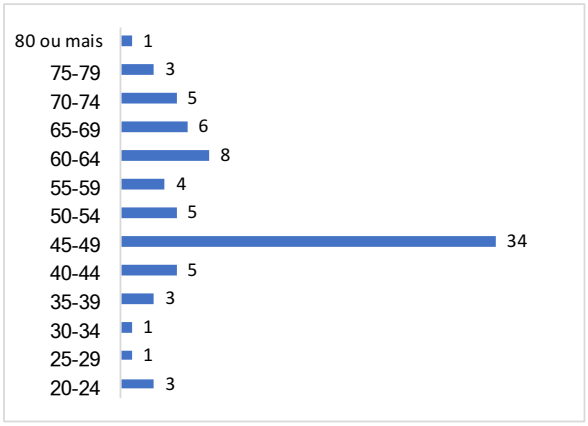
Table 1 . Cases of malignant in adults 2018 and 2022

Regarding gender, females accounted for the majority of diagnoses with 56 cases (71%), while males represented 29%, as seen in **Graph 2**.



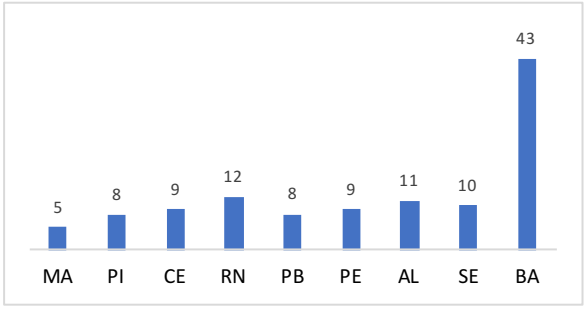
Graph 2. Distribuition by sex

The distribution of malignant meningioma diagnoses by age group in the northeastern region from 2018 to 2022 is depicted in **Graph 3**. There is a predominance of individuals aged 45 to 54 years, with 34 cases (43.04%), while the less prevalent age ranges were 25 to 29, 30 to 34, and 80 years or older, each representing 1.27% of the total.



Graph 3. Distribuition diagnoses by age

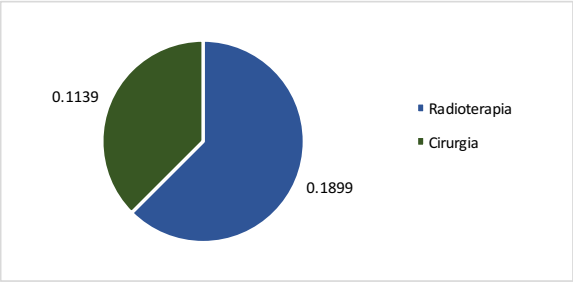
Illustrating the Federative Unit of residence of diagnosed patients within this time frame, we have **Graph 4**. It is evident that the majority of case notifications occurred in Bahia (37.39%), while the minority occurred in Maranhão (4.35%).



Graph 4. It is evident the majority in Bahia

Regarding the therapeutic modality, 79 cases were analyzed. Among these, 69.62% lacked treatment information, and among those with recorded informa-

tion, radiotherapy ranked first (18.99%). These data are visible in **Graph 5**.



Graph 5. The terapeutic mortality Radioyherapy Surgery

DISCUSSION

The results of this study provide valuable insights into the epidemiology, demographic profile, and treatment modalities associated with this rare condition. Concerning the demographic profile, it was observed that females accounted for the majority of cases, comprising 64.4% of the total patients diagnosed with malignant meningiomas. This predominance of females is an interesting finding and may indicate a possible gender-based difference in incidence. Previous studies have also suggested a higher prevalence of meningiomas in women, although the reasons for this discrepancy are not yet fully understood. Hormonal and genetic factors may play a role in this observation and warrant further investigation6.

Regarding age groups, the highest concentration of cases was observed in individuals aged 45 to 54 years, representing 39.1% of patients diagnosed with malignant meningiomas. This age pattern is consistent with the known epidemiology of meningiomas, which often affect middle-aged and elderly individuals. However, the occurrence of cases in younger patients should also be considered, and the analysis of risk factors and possible associations with this specific age group is relevant[7].

When considering the Federative Unit (UF) of residence of patients, Bahia stood out as the state with the highest number of reported cases of malignant meningiomas, representing 37.39% of cases. This regional variation may be related to various factors, including differences in exposure to risk factors, access to healthcare services, diagnostic capabilities, and genetic variations in the population. This geographic distribution highlights the need for a more in-depth analysis of regional disparities in the incidence of these conditions[8].

As for therapeutic modalities, it is important to note that a significant portion (69.62%) of cases had no available information on treatment. This emphasizes the importance of a comprehensive and robust data recording system for effective clinical information management[9]. Among the recorded cases, radiotherapy was the most commonly used therapeutic modality, representing 18.99% of patients. Radiotherapy plays a crucial role in the treatment of malignant meningiomas, especially in cases where surgery is not feasible or when tumor size reduction is required before surgical intervention[10].

CONCLUSION

The epidemiological study revealed a prevalence of cases in females, in the age group of 45 to 54 years, and in the state of Bahia. It is noteworthy that there is an insufficient amount of data regarding therapeutic modalities in the Northeast region. The absence of treatment notification represents a scenario that deserves attention in Brazilian public health, aiming to consolidate information to better promote the provision of therapeutic resources. Thus, this study demonstrates the importance of allocating resources to reduce the incidence of cases in this disproportionately affected segment of the population.

REFERENCES

1. Maggio I, Franceschi E, Tosoni A, Nunno VD, Gatto L, Lodi R, et al. Meningioma: not always a benign tumor. A review of advances in the treatment of meningiomas. CNS Oncology. 2021 Jun 1;10(2).

2. Gittleman HR, Ostrom QT, Rouse CD, Dowling JA, de Blank PM, Kruchko CA, et al. Trends in central nervous system tumor incidence relative to other common cancers in adults, adolescents, and children in the United States, 2000 to 2010. Cancer. 2014 Aug 25;121(1):102–12.

3. Ostrom QT, Gittleman H, Liao P, Vecchione-Koval T, Wolinsky Y, Kruchko C, et al. CBTRUS Statistical Report: Primary brain and other central nervous system tumors diagnosed in the United States in 2010–2014. Neuro-Oncology. 2017 Oct;19(suppl_5):v1–88.

4. Achey RL, Gittleman H, Schroer J, Khanna V, Kruchko C, Barnholtz-Sloan JS. Nonmalignant and malignant meningioma incidence and survival in the elderly, 2005–2015, using the Central Brain Tumor Registry of the United States. Neuro-Oncology. 2018 Oct 6;21(3):380–91.

5. Goldbrunner R, Minniti G, Preusser M et al. EANO guidelines for the diagnosis and treatment of meningiomas. Lancet Oncol. 17(9), e383–391 (2016).

6. Norden AD, Reardon DA, Wen PCY. Primary Central Nervous System Tumors: Pathogenesis and Therapy [Internet]. Google Books. Springer Science & Business Media; 2010 [cited 2023 Oct 24]. Available from: https://books.google.com.br/books?hl=pt-BR&lr=&id=HfXkXoTG4DoC&oi=fnd&pg=PR5&dq=Primary+Central+Nervous+System+Tumors:+Pathogenesis+and+Therapy.+&ots=y-7D5tc-6kY&sig=dOhSh7i2SNf8f-gtgjbZs1-NsjA

7. Preston DL. Tumors of the Nervous System and Pituitary Gland Associated With Atomic Bomb Radiation Exposure. CancerSpectrum Knowledge Environment. 2002 Oct 16;94(20):1555–63.

8. Vadivelu S, Sharer L, Schulder M. Regression of multiple intracranial meningiomas after cessation of long-term progesterone agonist therapy: Case report. Journal of Neurosurgery [Internet]. 2010 May 1 [cited 2023 Oct 24];112(5):920–4. Available from: https://thejns.org/view/journals/j-neurosurg/112/5/article-p920.xml

9. Rogers L, Barani I, Chamberlain M, Kaley TJ, McDermott M, Raizer J, et al. Meningiomas: knowledge base, treatment outcomes, and uncertainties. A RANO review. Journal of Neurosurgery [Internet]. 2015 Jan 1;122(1):4–23. Available from: https://thejns.org/view/journals/j-neurosurg/122/1/article-p4.xml

10. Wiemels J, Wrensch M, Claus EB. Epidemiology and etiology of meningioma. Journal of Neuro-Oncology. 2010 Sep;99(3):307–14.

RELATO DE CASO I *CASE REPORT*

Chylous pleural effusion as an unusual presentation of a sporadic lymphangioleiomyomatosis: A case report

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ABSTRACT

Sporadic Lymphangioleiomyomatosis (LAM) is a progressive lung disease affects predominantly women of childbearing age, causing dyspnea, spontaneous pneumothorax, cough, and chest pain. The condition results from the atypical proliferation of smooth muscle cells in the lungs. Therefore, the pathophysiology does not commonly include chylous pleural effusion, the formation of which depends on the rupture of the pulmonary lymphatic vessels and the diaphragm. With the presence of chylomicrons, pleural effusion acquires a milky appearance, visualized on thoracentesis, performed to provide relief to the patient and control the progression of the underlying disease. This article aims to report a clinical case with the unusual initial presentation of a chylous pleural effusion in the diagnosis of a sporadic lymphangioleiomyomatosis, highlighting the diagnosis, the measures adopted and the patient's evolution. In this way, it promotes the praise of an unusual repercussion of LAM, highlighting the importance of carrying out new studies aimed at a better understanding of the pathogenesis of the disease to enable the search for new therapeutic routes.

Keywords: Chylous Pleural Effusion, Sporadic Lymphangioleiomyomatosis, Diagnosis, Treatment, Case report.

INTRODUCTION

Lymphangioleiomyomatosis (LAM) is a chronic, multisystem disorder characterized by cystic lung destruction and the existence of extrapulmonary angiomyolipomas, associated with genetic mutations in the TSC1 or TSC2 gene.[1] Its estimated prevalence in Great Britain, France and the United States is 1 in 1 million.[2,3,4] In Brazil, data is scarce, however, there is record of an ongoing study in the pulmonology services of Hospital das Clínicas-FMUSP, Hospital São Paulo and Hospital do Servidor Público Estadual, which recorded 37 diagnosed cases of patients with LAM, from 1982 to 2004, of which 24 were alive and being followed up on that date.[5] With this epidemiological panorama, it is classified as a rare disease, in accordance with the determination of the World Health Organization of up to 65 affected in 100 thousand individuals.

Recebido: 13/12/2023
Aprovado: 28/12/2023

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DOI: 10.29327/258045.31.69-5

Initially, this pathology was first described in 1937 by Dr. Von Stossel. Currently, two etiological presentations of LAM are recorded: sporadic, S-LAM, a non-hereditary condition; and a manifestation associated with tuberous sclerosis, TSC-LAM, which is hereditary and can eventually affect males. Its pathologies result from the atypical proliferation of neoplastic cells (LAM cells), which present mutations or deletions in one of the tuberous sclerosis genes, TSC1 located on chromosome 9q34 or, more frequently, TSC2, which is located on chromosome 16p13.[6,7,8] Specifically, sporadic LAM is related to somatic mutations of the TSC2 gene, estimated to have a prevalence of approximately 3.3–7.7 per 1,000,000 women.[9]

In the meantime, the sporadic presentation of the disease consists of a progressive lung disease, the extent of which exceeds the involvement of TSC in the lung, while the presentation of hepatic and renal angiomyolipomas (AML) are more common in the latter.[10] The loss of heterozygosity of TSC2 was demonstrated in LAM cells isolated from lung, AML, blood, chyle and urine of patients with sporadic LAM and TSC. The TSC2 gene encodes tuberin, a GTPase-activating protein for the Rheb protein (protein enriched in brain Ras homologue) that binds to the guanine nucleotide that regulates the intracellular serine/threonine kinase signaling pathway.[10] Therefore, the inhibition or absence of tuberin, as occurs in sporadic LAM, results in: the accumulation of active Rheb-GTP; in mTOR stimulation; in the phosphorylation of S6 kinase and eukaryotic initiation factor 4E binding protein; and therefore increased translation, cell size and proliferation. Furthermore, it triggers cellular differentiation with manifestations similar to smooth muscles, poorly differentiated blood vessels and adipocytes.

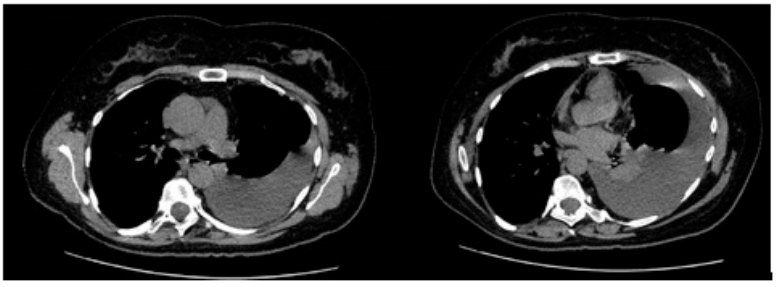
Next, the process that links the proliferation of differentiated cells with the formation of lung cysts and the destruction of the parenchyma is still unclear in the literature. However, it can be observed that compression of the airways by LAM cells, leading to distension of the terminal air spaces upstream of the occluded airway, has been proposed as the cause of cyst formation, in addition to considering the degradation of pulmonary elastic fibers caused by proteinases.[10] These increase lung remodeling and lymphangiogenesis by matrix metalloproteinases. As a result of this pathogenesis, the physiological mechanism of the disease is airflow obstruction and reduced pulmonary diffusion capacity, especially in patients with sporadic LAM, attributed to alveolar destruction with consequent loss of elastic recoil.[11]

Thus, the standard manifestations of the disease are mainly respiratory and include progressive dyspnea, recurrent spontaneous pneumothorax, cough, chest pain, hemoptysis, abdominal hemorrhage originating from AML or the discovery of abdominal or pelvic tumor masses. Its chronic pulmonary involvement can lead to respiratory failure. The main causes of dyspnea and exercise limitation are reduced respiratory reserve, dynamic hyperinflation and an exaggerated ventilatory response to exercise due to limited oxygen transfer due to loss of alveolar capillary surface area.[12,13,14]

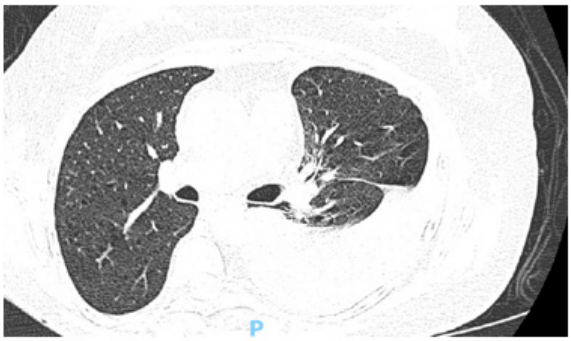
CASE REPORT

Patient, female, 48 years old, no children, single, born and living in Salvador, pedagogue, Catholic. She has had progressive dyspnea since November 2022, when she underwent an external echocardiogram that showed pericardial and pleural effusion. She was referred, in March 2023, to the Emergency Room of Mater Dei Hospital for evaluation, where she was being monitored by Pulmonology. She has a personal history of leucoderma, meningioma in follow-up, hypothyroidism and important family history of cancer: father with prostate cancer, mother with breast cancer and maternal uncles with lymphoma, pancreatic, colorectal and testicular cancer. She reports previous surgeries for trauma to the right upper limb and a blepharoplasty. She denied allergies, smoking and reported social alcoholism.

At the service, she performed a clinical assessment, submitted the patient to chest drainage and requested a Computed Tomography (CT) of the chest. The drainage presented a chylothorax appearance, suggesting that an imaging test be performed for better investigation. The results of the chest CT showed laminar pleural effusion on the left, with gas foci in between, associated with passive compressive atelectasis of the adjacent lung parenchyma. Furthermore, it indicated lymph node enlargement with atypical characteristics, with heterogeneous contrast enhancement, delimiting a hypodense central area (cysts). In this context, a consultation with Oncology was requested.



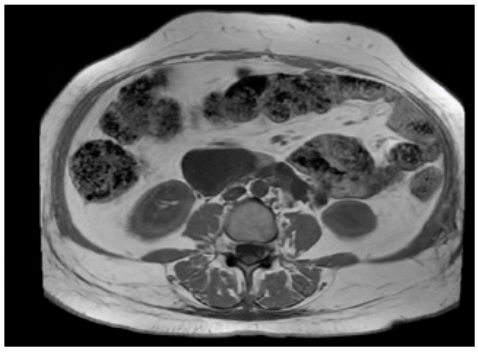
Picture 1 and **Picture 2**: Chest CT showing pleural effusion on the left.



Picture 3: Chest CT with presence of pulmonary cysts.

In order to further the investigation and evaluate abdominal involvement, an MRI and an abdominal CT scan were requested. Both showed multiple confluent cystic lesions in the retroperitoneum, retroperitoneal lymph nodes sometimes configuring adenomegaly, extending from the thoracoabdominal transition to the pelvis. These were located in an extra-peritoneal topography, as well as in a bilateral retrocrural topography, with defined limits and lobulated contours, with several thin internal septa, compatible with lymphangioleiomyomas. Immunohistochemical analysis confirms the diagnosis of LAM, while the absence of tuberous sclerosis favors the diagnosis of sporadic LAM.

Furthermore, the presence of: bilateral simple renal cortical cysts (angiomyolipomas); oval nodule in the left adrenal body, presenting a marked and slightly heterogeneous drop in signal intensity in the out-of-phase sequence, characterizing partial lipid content and may correspond to adenoma / myolipoma; and another small vascularized nodule in the right lobe of the liver, with signal characteristics and enhancement pattern by intravenous contrast compatible with hemangioma. Finally, an MRI of the skull confirmed an extra-axial expansive lesion occupying the right cavernous sinus and Meckel's cavus, suggestive of meningioma; and a shoulder resonance that indicated probable bursitis/adhesive capsulitis in the left shoulder.

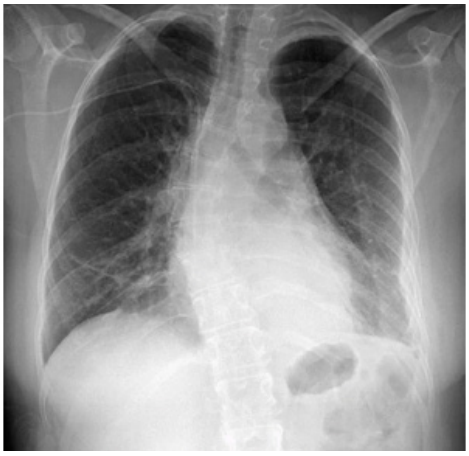


Picture 4: Abdominal CT showing abdominal lymphangiomas.

In the meantime, pleuroscopy was performed with lysis of adhesions and chemical pleurodesis on the left, total parenteral nutrition was introduced and intra-hospital Sirolimus was started. The patient was kept in hospital for monitoring and treatment progress for around a month and a half.

In the last oncological evaluation, during the consultation, she reported an episode of dyspnea after exertion the previous day and some episodes of night sweats but denied fever and weight loss. She was stable, afebrile, tolerating an oral diet, without previously introduced parenteral nutrition, with preserved physiological habits.

On physical examination, she was alert, oriented, syndromic, flushed, hydrated, acyanotic, anicteric, without peripheral lymphadenomegaly, afebrile. She is restricted to physically non-strenuous activities, but is able to walk and to perform work of a light or sedentary nature, for example, lighthouse work, office work (ECOG 1). Lung auscultation reveals reduced vesicular murmur at the base, without adventitious noises, respiratory rate of 19 ipm and oxygen saturation of 99% on room air. In cardiological, abdominal and extremity examinations, there were no changes. A control lung x-ray was requested before discharge, which showed complete remission of the stroke, and an echocardiogram is pending. However, the explanation for the dyspnea most likely lies in the underlying disease. She was advised on: the need for genetic consultation; diagnosis and management, highlighting Sirolimus drug therapy. After evaluation, medical discharge was recommended.



Picture 5: Control X-ray before hospital discharge.

DISCUSSION

Sporadic LAM is non-hereditary, predominantly affecting women in the reproductive period, whose average age is 37 years, although there are reports in the literature of cases in postmenopausal women.[15,16,17]

In a third of patients with LAM, the main and recurrent presentation is spontaneous pneumothorax, although considering the symptoms, the main condition is progressive dyspnea, among other respiratory disorders.[18] It can often be misdiagnosed as asthma or chronic obstructive pulmonary disease (COPD), as clinical manifestations overlap, and pulmonary function testing often shows an obstructive defect. In these conditions, the presence of pneumothorax in the evaluation is a determining factor in the diagnosis due to the literature as it precedes the diagnosis of LAM in 82% of cases, in addition to the fact that a cross-sectional study showed patients with LAM with a history of pneumothorax had an average of four previous episodes.[19]

Regarding pulmonary and abdominal findings, the chart followed existing guidelines on the use of chest CT to detect the presence of diffuse pulmonary cysts, either as the main diagnostic criterion or as the initial diagnostic test of choice, confirming the presence of cysts and angiomyolipomas and closing diagnosis with immunohistochemical analysis.[20,21] However, the reported patient's condition is unusual, even with the initial dyspnea, due to the initial manifestation of chylous pleural effusion. Its etiology can be divided into traumatic, accounting for 25% to 48% of all cases, and non-traumatic, of which malignancy is the main culprit, representing 17% to 46% of all cases. This occurs due to obstruction or injury to the lymphatic vessels that drain lymph from the lungs to the pleural cavity.[19] Within the framework of LAM, the atypical proliferation of cells in the lungs and around the lymphatic vessels causes their obstruction, triggering the accumulation of lymph rich in triglycerides in the pleural cavity, characterizing chylous pleural effusion.

Regarding treatment, chemical pleurodesis was chosen for more immediate relief of the patient's dyspnea and sirolimus as long-term treatment. The drug, metabolized in the liver by the cytochrome P450 enzyme system (with the main involvement of CYP3A4), is a selective inhibitor of the mTOR complex signaling pathway (target of rapamycin in mammals), responsible for several cellular growth and proliferation factors, stimulating various anabolic processes, such as protein, lipid and nucleotide synthesis and ribosome biogenesis, and inhibiting catabolic processes, such as autophagy. The action of its pharmacological inhibitor inhibits these processes, thus reducing cell proliferation and the formation of LAM cells. The drug has shown effectiveness in controlling the growth of angiomyolipomas, improving lung function and relieving respiratory symptoms in patients with LAM, confirmed by the evolution of the patient reported.

In summary, it is increasingly recognized that LAM is a neoplastic disease and can have a widely variable clinical presentation. Therefore, there is a danger in excessive dependence on lung imaging for the initial diagnostic consideration of LAM, including considering the incidence of chylous effusions within a setting of sporadic LAM. Ultimately, the importance of the report lies in the primary presentation of this sign, reinforcing its varied presentation, suggesting that further refinements in the diagnostic algorithm are needed to fully encapsulate the natural history of this disease, while ratifying the efficacy of standard treatment in remitting symptoms.

REFERENCES

1 Hohman DW, Noghrehkar D, Ratnayake S. Lymphangioleiomyomatosis: A review. Eur J Intern Med. 2008;19(5):319-324.
2 Johnson SR, Tattersfield AE. Clinical experience of lymphangioleiomyomatosis in the UK. Thorax 2000; 55:1052-7.
3 Urban T, Lazor R, Lacronique J, Murris M, Labrune S, Valeyre D, et al Pulmonary lymphangioleiomyomatosis a study of 69 patients. Medicine 1999; 78:321-27.
4 Kelly J, Moss J. Lymphangioleiomyomatosis. Am J Med Sci 2001; 321:17-25.
5 Medeiros Junior, P., & Roberto Ribeiro Carvalho, C. (n.d.). Linfangioleiomiomatose pulmonar* Pulmonary Lymphangioleiomyomatosis
6 Smolarek TA, Wessner LL, McCormack FX, Mylet JC, Menon AG, Henske EP. Evidência de que a linfangiomiomatose é causada por mutações no TSC2, perda de heterozigosidade do cromossomo 16p13 em angiomiolipomas e linfonodos de mulheres com linfangiomiomatose. Sou J Hum Genet. 1998;62(4):810–815.
7 Carsillo T, Astrinidis A, Henske EP. Mutações no gene do complexo da esclerose tuberosa TSC2 são uma causa de linfangioleiomiomatose pulmonar esporádica. Proc Natl Acad Sci EUA. 2000;97(11):6085–6090.
8 Yu J, Astrinidis A, Henske EP. Perda de heterozigosidade do cromossomo 16 na esclerose tuberosa e linfangiomiomatose esporádica. Sou J Respir Crit Care Med. 2001;164(8):1537–1540.
9 Taveira-DaSilva, A. M., & Moss, J. (2015). Clinical features, epidemiology, and therapy of lymphangioleiomyomatosis. Clinical Epidemiology, 7, 249–257. https://doi.org/10.2147/CLEP.S50780
10 Avila NA, Dwyer AJ, Rabel A, Moss J. Sporadic lymphangioleiomyomatosis and tuberous sclerosis complex with lymphangioleiomyomatosis, comparison of CT features. Radiology. 2007;242(1):277–285.
11 Sobonya RE, Quan SF, Fleishman JS. Linfangioleiomiomatose pulmonar: análise quantitativa de lesões que produzem limitação do fluxo aéreo. Hum Pathol . 1985;16(11):1122–1228.
12 Crausman RS, Jennings CA, Mortensen RL, Ackerson LM, Irvin CG, King TE Jr. Linfangioleiomiomatose: a fisiopatologia da diminuição da capacidade de exercício. Sou J Respir Crit Care Med. 1996; 153(4 Pt 1):1368–1376.
13 Taveira-DaSilva AM, Stylianou MP, Hedin CJ, et al. Consumo máximo de oxigênio e gravidade da doença na linfangioleiomiomatose. Sou J Respir Crit Care Med. 2003;168(12):1427–1431.
14 Sobonya RE, Quan SF, Fleishman JS. Linfangioleiomiomatose pulmonar: análise quantitativa de lesões que produzem limitação do fluxo aéreo. Hum Pathol. 1985;16(11):1122–1228.
15 Singh M; Sahora V; Wadhwa R; Khurana N; Kakkar AK. Solitary Lymphangioleiomyoma of Pancreas Mimicking Pancreatic Pseudocyst –A Case Report. Journal of Gastrointestinal Cancer 2010
16 Iwasa Y; Tachibana M; Ito H; Iwami S; Yagi H; Yamada S; Okagaki A; Ban C; Mano M; Kodama Y; Ueda M. ExtrapulmonaryLymphangioleiomyomatosis in Pelvic and Paraaortic Lymph Nodes Associated With Uterine Cancer: a report of 3 cases. Internacional Jounal of Gynecologicalpathology. 2011. 30(5):470-475.
17 Killedar, MM; Kulkarni SH; Phanasopakar M; Patil PP; More S. Retroperitoneal Mass-lymphangiomyoma. Indian J Surg 2012. 74(5):428-430.
18 O'Mahony AM, Lynn E, Murphy DJ, Fabre A, McCarthy C. Lymphangioleiomyomatosis: a clinical review. Breathe (Sheff). 2020 Jun;16(2):200007. doi: 10.1183/20734735.0007-2020. PMID: 33304400; PMCID: PMC7714539.
19 Chen YS, Memon P. Lymphangioleiomyomatosis manifesting as refractory chylothorax and chyloperitoneum. BMJ Case Rep. 2019 Jul 11;12(7): e229958. doi: 10.1136/bcr-2019-229958. PMID: 31300601; PMCID: PMC6626491.
20 Johnson SR, Cordier JF, Lazor R, et al. European Respiratory Society guidelines for the diagnosis and management of lymphangioleiomyomatosis. Eur Respir J 2010; 35:14–26.
21 Gupta N, Finlay GA, Kotloff RM, et al. Lymphangioleiomyomatosis Diagnosis and Management: High-Resolution Chest Computed Tomography, Transbronchial Lung Biopsy, and Pleural Disease Management. An Official American Thoracic Society/Japanese Respiratory Society Clinical Practice Guideline. Am J Respir Crit Care Med 2017; 196:1337–48.

Temporal trend study of the mortality rate from prostate cancer (2011 to 2020), by age group, in Brazil

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ABSTRACT

Prostate cancer (CaP) is the second most common malignant tumor among men in Brazil and represents a significant factor in mortality when diagnosed late. Studies on mortality are relevant sources for understanding the epide- miological profile and as- sessing the importance of CaP as a public health problem. The objective was to de- scribe the distribution and temporal trends of the mortality rate in different age groups (30 to 80 years or more) in Brazil between the years 2011 - 2020. The research has a quantitative and analytical character, through data collection mortality in the Mortality Information Sys- tem (SIM) of the Ministry of Health (SIM/MS/DATASUS). The mortality coefficient due to malignant prostate neoplasia was calculated annually, considering age range, then arranged in simple dispersion data with linear models. According to the analyses, it was observed that the incidence of prostate cancer was 95% in indi- viduals over 60 years of age. Furthermore, the mortality rate prevailed in white ethnic groups, with low education and married people. Among the years analyzed, the period with the peak in mortality was in 2017, representing 29%. In view of this, a linear de- cline in CaP mortality rates was evidenced in all age groups between the years 2011 - 2020. However, there was a higher prevalence of deaths from the sixth decade of life onwards, highlighting the population above 80 years. Thus, it was possible to analyze the stability of deaths in the population between 30 and 59 years old. Despite the drop in prostate cancer mortality rates, the persistence of deaths after the age of 60 high- lights the need for continuous and differentiated strategies to face this public health challenge in Brazil.

Keywords: Prostate cancer. Time trends. Mortality.

INTRODUCTION

Prostate cancer (CaP) is the second most common malignant tumor among men in Brazil and represents a significant factor in mortality when diagnosed late. Tu- mor growth is insidious, therefore, screening tests are necessary to identify the disease early and favor the prognosis[1].

Recebido: 13/12/2023
Aprovado: 28/12/2023

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DOI: 10.29327/258045.31.69-6

The increase in its incidence over the years is attributed to the increase in the population's life expectancy and advances in diagnostic procedures[2]. The disease mainly affects people over the age of 65. According to the National Cancer Institute (INCA), CaP is predominant in all Brazilian states, accounting for 72 thousand new cases, as an estimate, per year over the next 30 years, behind only non-melanoma skin cancer, in which, it is expected that approximately 74 thousand new cases occur in Brazil during the three-year period between 2023 – 2025[3]. This corresponds to an estimated risk of 67.86 new cases per 100,000 men, according to INCA estimates[4].

Early detection impacts treatment success and prognosis. Currently, this screening is carried out annually with a digital rectal exam and the Prostate Specific Antigen (PSA) value, with changes being signs of CaP. The Brazilian Society of Urol- ogy (SBU) recommends that all men begin clinical screening, even without complaints, from the age of 50 or from the age of 45, if there are risk factors such as a family history of the disease or black race[5].

The Gleason system, named after pathologist Donald Gleason, is a key part of prostate cancer risk classification according to the D'Amico scheme. This system as- sesses the degree of differentiation of prostate cancer cells, based on microscopic analysis of biopsy samples. The Gleason score ranges from 2 to 10 and is determined by the appearance of the cancer cells, with higher levels indicating less differentiated and more aggressive cells. In conjunction with other factors such as tumor stage and PSA levels, the Gleason score is used in the D'Amico risk classification to help guide treatment decisions in patients with prostate cancer[6].

Prostate cancer staging is based on histopathological analysis of the prostate and is classified as low, intermediate and high risk. Low-risk patients have T1-T2a, Gleason 6 (ISUP 1) and PSA less than 10, not requiring additional imaging tests. On the other hand, those with intermediate risk have T2b or Gleason staging 7 (ISUP 2 and 3) or PSA between 10 and 20, and undergo imaging tests such as CT or MRI, along with a bone scan to screen for metastases. High-risk patients, in turn, have T2c or Gleason greater than 7 (ISUP 4 and 5) or PSA greater than 20, requiring the same tests to be carried out to screen for metastases[7].

The incidence of prostate cancer has increased significantly over the years, be- coming one of the most common neoplasms among the male population[4]. In this context, the current study seeks to describe the distribution and temporal trends of the CaP mortality rate in different age groups (30 to 80 years or more) in Brazil between the years 2011 - 2020, in order to support future public policies and more effective promotion, prevention and treatment strategies for the disease, in addition to guiding, raising awareness and educating the male population about the importance of preven- tive exams and early diagnosis. Furthermore, investigating the evolution of the CaP mortality rate in different age groups is necessary in order to identify possible variations and trends.

MATERIAL AND METHODS

The study consists of quantitative and analytical temporal research (historical se- ries), which aims to describe the distribution and temporal trends of the prostate cancer mortality rate in different age groups in Brazil between 2011 and 2020, in addition to identifying the prevalence of the CaP mortality rate in people over 30 years of age, by collecting mortality data in the Mortality Information System (SIM) of the Ministry of Health (SIM/MS/DATASUS).

Inclusion and exclusion criteria were established to begin data collection using SIM/MS/DATASUS data. Cases such as: International Statistical Classification of Diseases and Related Health Problems (ICD) 61 will be included; age group from 30 years old; categories for color/race (White, brown, black, yellow and indigenous); education (none, 1-3 years, 4-7 years, 8-11 years, 12 years and more, 1-8 years and 9-11 years); and marital status (single, married, widowed, legally separated and others). However, patients with metastases will be excluded.

The collected data used were deaths of men over the age of 30, collected from 2011 to 2020. Population estimates, classified by sex and age group (>30 years), were obtained from the Brazilian Institute of Geography and Statistics (IBGE) and used to calculate prostate cancer (CaP) mortality coefficients. The ICD-10: C61 category was selected from the available options, and age groups under 30 years old were excluded, obtaining the desired variables one at a time until the completion of the data collection used in this study. The information was obtained by selecting the DATASUS website, followed by the choice of "TABNET" and "Vital Statistics". Then, the option "Mortality – since 1996 by ICD-10" and "General Mortality" were selected, selecting the option "Brazil by region and Federation unit", directed to the electronic address: http://tab- net.datasus.gov.br/cgi/deftohtm.exe?sim/cnv/obt10uf.def. In which, the selected study location was Brazil, divided by Region/Federation Unit".

The mortality coefficient for malignant prostate neoplasia was calculated in each year investigated, considering the age group, where the mortality coefficient was de- fined as the ratio between the number of deaths and the population at risk, multiplied by 100,000 inhabitants to improve data visualization. It is noteworthy that the mortality coefficient refers to the relationship between the total number of deaths in a given re- gion and the population exposed to the risk of death, unlike the lethality rate, which relates the number of deaths to the number of people affected by the disease. in question.

This study follows national research ethics standards and, as it uses only public domain data, does not require approval from the ethics and research committee, reg- ulated by the Guidelines and Standards for Research on Human Beings, in accordance with Resolution No. 466/12 of the National Health Council/ Ministry of Health.

The data obtained was compiled and analyzed by GraphPad 8 – Prism. A de- scriptive analysis of temporal trends was carried out using simple dispersion data, with linear models. Considering mortality trends that may be different in each age group. A function f(x) with its respective R 2 was created to represent the linear trend.

RESULTS

Of the deaths that occurred in Brazil between 2011 and 2020 related to prostate cancer, 95.17% occurred in individuals over 60 years of age, with 43.71% of these cases occurring in people aged 80 or over. The majority of deaths were of individuals of white color/ race, representing 51.39% of the total, followed by individuals of brown color/race, with 33.99% and with a lower representation in indigenous people. In rela- tion to education, 27.38% of records had between 1 and 3 years of education and 19.47% of deaths occurred in individuals who did not have the ability to understand and produce texts in accordance with social practices that involve reading and writing, which are based on language, as they do not have education. In which, the lowest proportion was in individuals with 12 years or more of schooling, represented by 5.69%. The majority of deceased individuals (54.08%) were married, totaling 79,277 records and, to a lesser extent, they had another marital status (3.08%), as shown in **Table 1**.

Table 1. Epidemiological data on deaths from prostate cancer in Brazil, between 2011 – 2020, in people over 30 years of age, in Brazil.

	N	%
Age Range		
80 years and over	64,034	43.71
70 to 79 years old	50,165	34.24
60 to 69 years old	25,222	17.22
50 to 59 years old	6,177	4.22
40 to 49 years old	756	0.52
30 to 39 years old	129	0.09
Age ignored	11	0.01
Color/Race		
White	75,290	51.39
Brown	49,795	33.99
Black	14,659	10.01
Yellow	917	0.63
Indigenous	236	0.16
Ignored	5,597	3.82
Education		
1 to 3 years	40,129	27.39
None	28,527	19.47
4 to 7 years	26,527	18.11
8 to 11 years old	15,598	10.65
12 years and over	8,335	5.69
Ignored	27,378	18.69
Marital status		
Married	79,227	54.08
Widower	28,428	19.41
Single	16,586	11.32
Legally separated	8,216	5.61
Other	4,518	3.08
Ignored	9,465	6.46

Source : written by the author, 2023.

The mortality rate, which presents the linear trend line. It is demonstrated in the formula that f(x)= 0.06710x – 106.5, a coefficient of determination R^2=0.3293 was ob- tained.

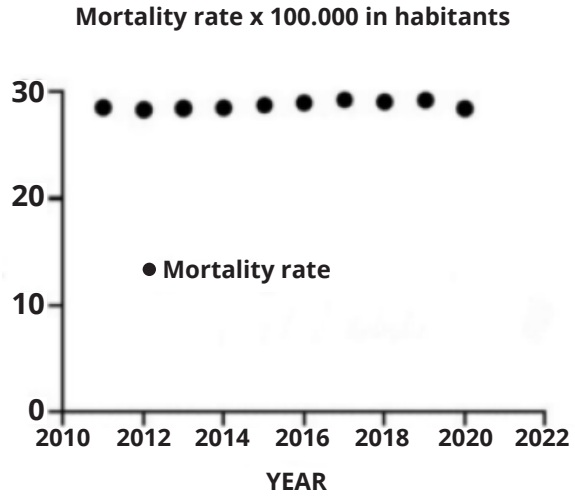


Figure 1. Prostate cancer mortality rate, by year, per 100,000 inhabitants among men over 30 years old, between 2011 – 2020, in Brazil.

Source : written by the author, 2023.

In 2011, the prostate cancer mortality rate per 100,000 inhabitants was approxi- mately 28.51, in 2017 reaching its maximum peak of approximately 29.25 and reaching approximately 28.41 in the last year (2020). The values referring to the annual mortality rate are presented in figure 1 and represented in **table 2**.

Variations were found in prostate cancer mortality rates per 100,000 inhabitants, in different periods and in the different age groups analyzed in this study. In the younger age group (men aged 30 to 39), rates varied approximately from 0.07 (2011) to 0.11 (2015), decreasing to 0.08 in 2020. On the other hand, in the younger age group more advanced age (over 80 years), the rates started at 536.46 (2011) and de- creased to 425.86 in 2020. Furthermore, the relevant increase in rates starts from the age of 60, with a value of 41.10 (2011) and 35.56 in 2020 in this age group. The ana- lyzes indicated a possible increase in mortality rates over 60 years of age and plausible stability in younger age groups.

A similar study was carried out in each age group, per year, with the aim of in- vestigating the mortality rate from prostate cancer in different age groups. The col- lected data was compiled in **Table 3** and analyzed through **Figure 2**, which displays dispersion points along with their respective linear trend lines. These analyzes make it possible to identify possible patterns of behavior in the mortality rate in relation to the age of individuals, making it possible to understand the re- lationship between time and number of individuals. It can be seen in figure two that the graphic elements of the age groups of 30 – 39, 40 – 49 and 50 – 59 years are overlapping, as they are close to the x-axis, due to their results and the size of the graph.

Table 2. Prostate cancer mortality rate, per year, among men over 30 years old, between 2011 – 2020, in Brazil.

Year	Number of deaths	Population at Risk	Mortality Rate x 100,000 Inhabit- ants
2011	13,117	45,995,986	28.5177
2012	13,342	47,195,152	28.2699
2013	13,760	48,408,565	28.4247
2014	14,154	49,607,268	28.5321
2015	14,473	50,414,358	28.7081
2016	14,910	51,494,614	28.9545
2017	15,377	52,567,080	29.2521
2018	15,562	53,628,677	29.0181
2019	15,972	54,672,862	29.2138
2020	15,827	55,696,224	28.4166

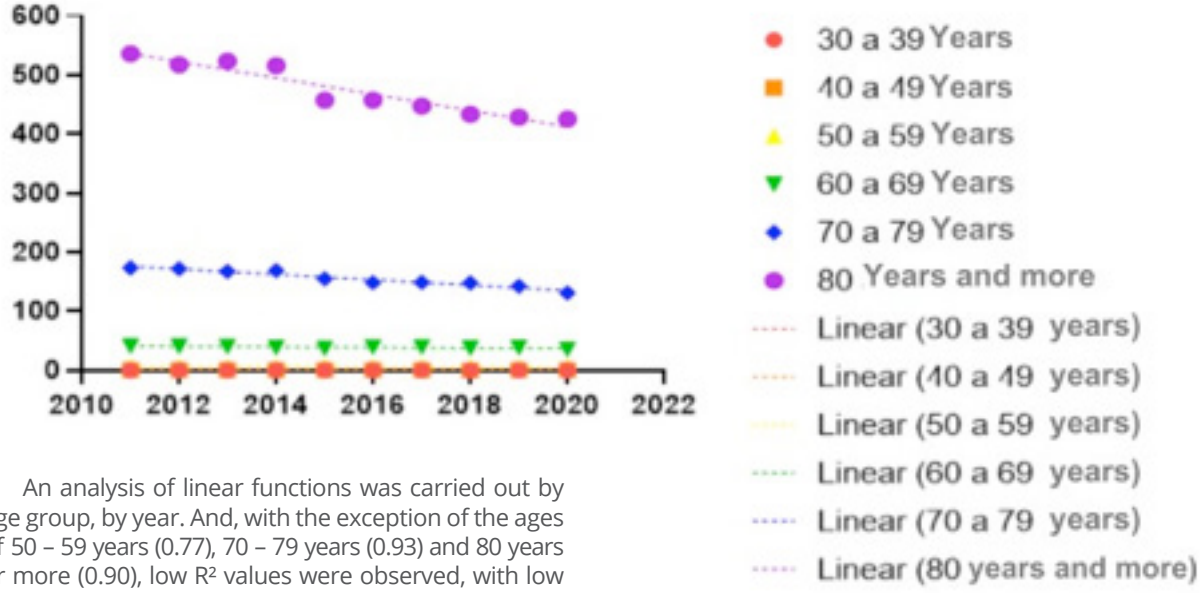
Source : written by the author, 2023.

Table 3. Prostate cancer mortality rate, per 100,000 inhabitants, per year, by age group, among men over 30 years old, between 2011-2020, in Brazil.

	30 to 39 years old	40 to 49 years old	50 to 59 years old	60 to 69 years old	70 to 79 years old	80 years or more
2011	0.0716	0.5852	6.1643	41.1072	173.7894	536.4607
2012	0.1081	0.6017	6.1868	40.5945	172.1766	517.9439
2013	0.0435	0.6257	6.3329	40.0159	167.6800	523.7561
2014	0.1035	0,6716	5,9712	38,8470	169,2200	516,0981
2015	0,1114	0,6246	6,0420	37,3764	155,4219	457,9166
2016	0,0855	0,5165	6,0023	39,5571	148,5854	457,9553
2017	0,0725	0,5605	6,0247	39,7229	149,0325	447,8062
2018	0,0659	0,4701	5,8056	37.7286	148.2538	433.6334
2019	0.0476	0.5334	5.8016	38.6451	142.8626	428.9269
2020	0.0829	0.5512	5.5873	35.5639	131.2904	425.8609

Source : written by the author, 2023.

Figure 2. Prostate cancer mortality rate, per 100,000 inhabitants, per year, by age group, among men over 30 years old, between 2011-2020, in Brazil.



Source : written by the author, 2023.

An analysis of linear functions was carried out by age group, by year. And, with the exception of the ages of 50 – 59 years (0.77), 70 – 79 years (0.93) and 80 years or more (0.90), low R^2 values were observed, with low significance. Indicating a possi- ble low correlation between time and mortality rate, as demonstrated in the age groups of 30 – 39 years, 40 – 49 years and 60 – 69 years, where the R^2 values are compiled in **table 4.** This may suggest that other factors, in addition to time, may be influencing prostate cancer mortality in different age groups.

Table 4. R 2 values for Linear Trend of prostate cancer mortality rate, per 100,000 inhabitants, per year, among men over 30 years old, between 2011 – 2020, in Brazil.

	30 to 39 years old	40 to 49 years old	50 to 59 years old	60 to 69 years old	70 to 79 years old	80 years or more
R^2	0.0646	0.3789	0.7761	0.5971	0.9339	0.9080

Source : written by the author, 2023.

DISCUSSION

It is observed that the number of deaths is higher in white men aged 80 or over, with the highest mortality rate among those who have 1 to 3 years of education. Fur- thermore, the majority of victims are married men. In 2017, the death rate reached 29.3, the highest peak during the years observed. The mortality rate was consistently higher in individuals aged 80 and over in every year, especially in 2011, with significant increases starting at age 60. No significant results were found related to death from prostate cancer in individuals under 69 years of age.

In general terms, the articles used as a research basis pointed out that prostate cancer mortality in Brazil has demonstrated a trend of stability or reduction in recent years. However, this trend may vary depending on the age group examined. In partic- ular, among the youngest, there is a propensity for stability, in contrast to the more advanced age groups, from the sixth decade of life onwards. These results emphasize the importance of carrying out preventive screenings and ongoing monitoring, espe- cially in older men, to enable early detection and effective treatment of prostate cancer.

There was a reduction in the death rate from prostate cancer in all age groups. However, the incidence of prostate cancer remains high among men aged 70 and over, with a mortality rate 14 times higher than that of men under 60. This suggests that the reduction in mortality can be attributed to early diagnosis and improved treatment.

The current study confirms the findings of Luizaga et al. In 2020 and by Brito and Weller in 2022 8 , highlight ing that the majority of deaths occur among men aged 70-79 and 80 years or older compared to other age groups. This provision was at- tributed to the lack of access to treatments and the aging of the population, as well as the consequences of socioeconomic inequalities in Brazil, highlighting the importance of public policies that address socioeconomic inequalities and promote equitable ac- cess to health services throughout the country, especially in relation to CaP.

The need for actions that promote awareness about the disease among low- income and low-education populations is highlighted. It was pointed out that patients' quality of life is also an important indicator to be considered and that adequate and individualized treatment can contribute in this aspect.

In this context, analyzes suggest that mortality related to prostate cancer in Bra- zil is decreasing, although this trend varies according to age, race and level of educa- tion. Therefore, carrying out early diagnoses, followed by personalized and appropriate treatments, can lead to a reduction in the mortality rate, resulting in a better quality of life for patients and fewer deaths.

This study, however, faces significant challenges. Dependence on data from the Mortality Information System (SIM/MS/DATASUS) can result in underreporting and inaccuracies, compromising the accuracy of conclusions. Exclusion of cases with me- tastases may limit comprehensive understanding of the impact of prostate cancer, as the presence of metastases is a crucial variable in disease progression. Furthermore, restricting data collection to the period from 2011 to 2020 may not capture recent changes in health policies and technological advances, directly impacting the study results.

CONCLUSION

The study evaluated prostate cancer mortality rates in Brazil between the years 2011 – 2020. The analysis showed a downward trend in prostate cancer mortality in Brazil in recent years, but with a significant increase after the age of 60, with a stabili- zation in the population aged 30 – 59 years. The importance of public policies that address socioeconomic inequalities and promote equitable access to health services throughout the country is highlighted, especially in relation to prostate cancer, in addi- tion to raising male awareness about the importance of promotion, prevention and early diagnosis of the disease.

REFERENCES

1. Pereira GK et al. Factors associated with masculinity in the early diagnosis of prostate cancer: narrative review. Rev nursing. 2021; 24(277): 5803-5810.

2. Rego RFNB, Barros RA, Pimenta LOS, Rodrigues JVC, Anjos EB. Clinical Ep- idemiological Profile of the Population Served in a Prostate Cancer Screening Program. Rev At Sau. 2020; 65(18): 38-47.

3. Estimate 2023: incidence of cancer in Brazil [Internert]. José Alencar Gomes da Silva National Cancer Institute (INCA). 2022 [Quoted in: 2023 Apr 20]; Available at: https://www.inca.gov.br/sites/ufu.sti.inca.local/files//me-dia/docu- ment//estimativa-2023.pdf.

4. Ferreira U. Localized prostate cancer. In: Brazilian Society of Urology, ed. Urol- ogy Manual. São Paulo: Editora Planmark; 2010. p. 187-200.

5. Zequi SC, Campos RSM. Localized prostate cancer. In: Nardozza Júnior A, Zerati Filho M, Reis RBB, editors. Fundamental Urology. São Paulo: Ed-itora Planmark; 2010. p.119-130.

6. Smaletz Oh. Metastatic prostate cancer. In: Brazilian Society of Urology, ed. Urology Manual. São Paulo: Editora Planmark; 2010. p. 215-226.

7. Mottet, N. et al. Eau-eanm-estro-esurisup-siog guidelines on prostate cancer. Mar. 2023. Available at: https://uroweb.org/guidelines.

8. Luizaga CTM, Ribeiro KB, Fonseca AM, Neto E. Trends in prostate cancer mortality in the state of São Paulo, 2000 to 2015. Rev Saúde Publica.2020;54:87.

9. Silva GAE, Jardim BC, Ferreira VM, Junger WL, Girianelli VR. Cancer mortality in the Capitals and in the interior of Brazil: a four-decade analysis. Rev Public Health. 2020 Dec 4; 54:126.10. Brito, EBN, Weller M. Risk factors for prostate cancer: case-control study in Northeast Brazil. See. Health and Research. 2022; 15 (1).

11. Oliveira TC et al. Prostate cancer in men treated in a highly complex healthcare unit: epidemiological profile. Rev. De Div. Scien. Sena Aires. 2021; 10 (3).

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