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Epidemiological Profile of Tuberculosis in Elderly People in the Municipality of Abaetetuba, Pará (2019–2023)

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Summary

Tuberculosis (TB) remains a significant public health problem, especially among vulnerable populations such as the elderly. This study aimed to analyze the epidemiological profile of elderly individuals affected by tuberculosis in the municipality of Abaetetuba, Pará, from 2019 to 2023. This is a descriptive study with a quantitative approach, based on secondary data obtained from the Notifiable Diseases Information System (SINAN), provided by DATASUS. The results showed a higher incidence of the disease in the 60-64 age group and a predominance in males. A high prevalence of diabetes mellitus as an associated comorbidity was also observed, highlighting its importance.

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Relevance as a risk factor for the development of active TB. Regarding behavioral factors, smoking and alcoholism were infrequent, although they are known to negatively impact the immune response and adherence to treatment.
A significant gap was also identified in HIV testing, which compromises early diagnosis and appropriate case management. The findings reinforce the need for integrated care strategies with a multidisciplinary approach, aimed at improving care and reducing morbidity and mortality from tuberculosis in the elderly population.
Keywords: Tuberculosis; Elderly; Epidemiology; Diabetes Mellitus; Risk factors; Public health.

Abstract

Tuberculosis (TB) remains a significant public health issue, particularly among vulnerable populations such as the elderly. This study aimed to analyze the epidemiological profile of elderly individuals diagnosed with tuberculosis in the municipality of Abaetetuba, Pará, Brazil, from 2019 to 2023. This is a descriptive study with a quantitative approach, based on secondary data obtained from the Notifiable Diseases Information System (SINAN), available through DATASUS. The results showed a higher incidence of the disease among individuals aged 60 to 64 years, with a predominance in males. A high prevalence of diabetes mellitus as an associated comorbidity was also observed, highlighting its relevance as a risk factor for the development of active TB. Regarding behavioral factors, smoking and alcoholism showed low frequency, although they are known to affect immune response and treatment adherence negatively. A significant gap in HIV testing was identified, compromising early diagnosis and appropriate case management. The findings emphasize the need for integrated and multidisciplinary care strategies to improve healthcare delivery and reduce tuberculosis-related morbidity and mortality among the elderly population.
Keywords: Tuberculosis; Elderly; Epidemiology; Diabetes Mellitus; Risk factors; Public health.

INTRODUCTION

Tuberculosis (TB), also known as the "disease of the 19th century," is a disease infectious disease caused by the bacterium *Mycobacterium tuberculosis,* which can affect primarily the lungs (pulmonary form), but also other organs and systems (form extrapulmonary) (Barberis et al., 2017). It is a potentially fatal disease when not treated properly, and although the Bacillus Calmette-Guérin (BCG) vaccine is offered free of charge by the Unified Health System, the disease still presents high rates. mortality (Fuzinato et al., 2024).

It has a higher incidence in immunocompromised individuals, such as patients with HIV/AIDS, as well as in more vulnerable populations, such as people deprived of their liberty. Transmission occurs primarily through respiratory droplets released by individuals.

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with active infection (pulmonary or laryngeal TB) during speech, coughing or sneezing (Brazil, 2019).

The clinical manifestations of pulmonary TB can vary and include dry cough or productive for more than three weeks, weight loss, dyspnea, night sweats, and fever. Evening symptoms. These manifestations may be present in different forms of the disease: primary, secondary, and miliary. In the primary form, the individual has their first contact with the bacillus, and the symptoms tend to be more insidious, and may include loss of appetite and low-grade fever. being more common in children. In the secondary form, the most affected individuals are young adults, who present with more intense symptoms, such as productive or dry cough, Hemoptysis and anorexia, especially in regions with a low incidence of the disease. In the form... Miliary, the presentation can be acute or subacute, with radiological changes and possible Systemic manifestations, such as hepatomegaly and nervous system involvement. central, especially in immunocompromised patients (Brazil, 2019).

The clinical manifestations of extrapulmonary tuberculosis are varied, as they depend on... of the affected organs and systems. In the pleural form, young individuals constitute the group most commonly affected, presenting the classic triad of asthenia, anorexia, and weight loss, and may It can be confused with bacterial pneumonia, which is an important diagnostic factor. differential. Pleural fluid is characterized as an exudate, with a predominance of lymphocytes and elevated levels of adenosine deaminase (ADA).

Another manifestation is tuberculous pleural empyema, which occurs as a consequence. from the rupture of a pulmonary cavity into the pleural space. The ganglion form is the The most common extrapulmonary presentation, primarily affecting the cervical lymph nodes. and supraclavicular. On physical examination, these lymph nodes may be enlarged and hardened. or softened. Fine needle aspiration or lymph node biopsy constitutes important diagnostic methods.

The meningoencephalitic form is more common in children, as is the skeletal form. Clinically, it can manifest with holocranial headache, drowsiness, and changes in Behavior, fever associated with abdominal pain and vomiting. Involvement of the pairs Cranial nerves II, III, IV, VI, and VII may occur, characterizing a picture of chronic meningitis.

In the bone form, the clinical presentation is characterized by local pain, tenderness to palpation, and Sweating. The hip and knee joints are among the most commonly affected. As for...

Pericardial tuberculosis manifests with a dry cough, chest pain, and dyspnea, and may or may not include other symptoms. It is associated with the pleural form. The pain may be nonspecific or related to other organs.

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such as in hepatic congestion (pain in the right hypochondrium) or in the presence of ascites, with Increased intra-abdominal volume (Brazil, 2019).

According to the Brazilian Ministry of Health (2019), the diagnosis of tuberculosis is based on- in direct bacilloscopy, through the search for acid-fast bacilli (AFB), by Ziehl-Neelsen method. Sputum smear microscopy, when performed correctly in two Samples — one at the time of the consultation and another the following day — allow for the detection of most of the cases of pulmonary TB, in addition to some cases of extrapulmonary TB.

The rapid molecular test for tuberculosis (TRM-TB) has greater sensitivity than that bacilloscopy allows the detection of rifampicin resistance. This test is also offered in the public health system. However, its application in children under 10 years of age. It is limited by the difficulty in collecting sputum.

Culture for mycobacteria associated with sensitivity testing shows high levels of sensitivity and specificity, being especially useful when bacilloscopy is Negative. However, its main limitation is the time required for bacterial growth. which varies between 14 and 30 days. Therefore, it is recommended to perform bacilloscopy and... Culture for mycobacteria, followed by sensitivity testing, with TRM-TB being used as Complementary tool for screening for rifampicin resistance (Brazil, 2019).

METHODOLOGY

In order to achieve the proposed objective, a study was carried out. descriptive epidemiological study, with a quantitative approach, based on secondary data obtained on platforms such as the Notifiable Diseases Information System (SINAN), provided by the Informatics Department of the Unified Health System. (DATASUS). Keywords used included tuberculosis, clinical, risk factors, Diabetes mellitus.

The study was conducted in the municipality of Abaetetuba, in the state of Pará, considering the Cases of tuberculosis reported in elderly individuals between 2019 and 2023. The population The study consisted of individuals aged 60 or older diagnosed with tuberculosis. during the established period. The following variables were analyzed: age group, sex, presence of comorbidities, with emphasis on Diabetes Mellitus, associated risk factors, such as Smoking and alcoholism, in addition to the situation regarding testing for the human immunodeficiency virus. (HIV).

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The data were organized into tables and then analyzed descriptively.
considering the number of cases and their proportions, with the aim of characterizing the profile.
epidemiological data from the individuals studied.

Because this study used secondary data, which is publicly accessible and did not identify the participants, there was no need to submit it to the Ethics Committee.
Search.

RESULTS

Table 1 – Distribution of tuberculosis cases in elderly people according to age group, sex and diagnosis of diabetes mellitus, between 2019 and 2023.

Variable	Category	n %	
Age Range (years)	60–64	16	34.04
	65–69	10	21.27
	70–79	14	29.78
	ÿ 80	7	14.89
Sex	Masculine	27	57.44
	Feminine	20	42.55
Comorbidity: Diabetes	Yes	14	29.78
	Not/Ignored	33	70.21

Source: Brazil. Ministry of Health. DATASUS. Notifiable Diseases Information System – SINAN (2025).

The data presented in Table 1 reveal that tuberculosis in elderly people in the municipality Abaetetuba/PA shows the highest incidence in the 60-64 age group (34.04%) and in male sex (57.44%). These results are consistent with the evidence from Eduardo et al. (2016) and Bhering et al. (2005), who also identified the predominance of the disease among men. and younger seniors (under 70 years old).

The literature indicates that tuberculosis in the elderly frequently results from resurgence of latent infections, with the elderly being more susceptible to reinfections. both endogenous and exogenous. Additionally, factors such as institutionalization and the process The physiological processes of aging create a scenario of vulnerability that demands attention. differentiated from the health network, as reinforced by Vendramini et al. (2003). The largest The prevalence in males, observed in Table 1, is a consolidated trend in documentary studies, which possibly reflects patterns of exposure and behavior to throughout life that manifest as a decline in senile immunity.

The high prevalence of Diabetes Mellitus (DM) observed in the sample (29.78%) highlights the need for integrated care protocols, given the TB/DM relationship is

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frequently underestimated and, in the national context, surpasses, in epidemiological importance, the

The relationship between TB and HIV requires rigorous management of these patients, considering that diabetes mellitus alters the risk of HIV infection.

significantly increases the immune response, raising the risk of developing active TB threefold.

times.

Intensified therapeutic monitoring is imperative in the management of tuberculosis (TB).
in patients with diabetes mellitus (DM), since this association substantially increases the
risk of treatment failure and unfavorable clinical outcomes. This vulnerability requires
Continuous monitoring not only of the bacterial load, but also of stability.
The patient's metabolic rate, ensuring that the drug regimen achieves the necessary effectiveness.
in an organism with a compromised immune response.

In line with this challenge, a multidisciplinary approach becomes a
This is an indispensable strategy, shifting the focus of clinical practice beyond isolated infection control.
Integrating glycemic control with adherence-focused actions is fundamental.
medication, recognizing that the chronicity of comorbidities demands assistance

A structured approach that takes into account the biopsychosocial characteristics of the elderly.

Finally, the complexity of this scenario is compounded by the atypical presentation of the disease.
in senescence, which makes thorough investigation of clinical outcomes necessary.
Multiple causes of death observed in cohorts of TB patients reinforce the importance
from a detailed clinical analysis that considers the dynamic interactions between the process
The physiological effects of aging and coexisting chronic diseases, thus ensuring a
A more assertive and preventative care plan.

Table 2 – Risk factors associated with and HIV testing status in elderly patients with tuberculosis in Abaetetuba/PA, between 2019 and 2023.

Risk Factor	State	n %
Smoking	Yes	5 10.63
	Not/Ignored	42 89.36
Alcoholism	Yes	1 2.12
	Not/Ignored	46 97.87
HIV	Positive	2 4.25
	Negative/Not completed/In progress	45 95.74

Source: Brazil, Ministry of Health, DATASUS, Notifiable Diseases Information System – SINAN (2025).

Table 2 summarizes the comorbidities and associated risk factors, highlighting
Crucial points for local epidemiological surveillance. The presence of diabetes mellitus (DM)
In 29.78% of cases, it stands out as the comorbidity with the greatest impact in the sample. This

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This association is corroborated by Souza Filho et al. (2023), who emphasize that individuals with DM They have a three times greater risk of developing active tuberculosis. The synergistic relationship The TB/DM ratio, often overlooked, is higher than the TB/HIV ratio nationally. which requires protocols for early detection of diabetes in patients with tuberculosis for to ensure therapeutic effectiveness.

The prevalence of smoking (10.63%) and alcoholism (2.12%) may seem low. in this sample; however, caution is needed in the interpretation. Studies such as those by Moraes et al. al. (2024) and Vasco et al. (2023) demonstrate that these substances interfere negatively. in treatment adherence and immune response, being predictors of therapeutic failures and unfavorable outcomes.

The high rate of HIV tests not performed or with missing records in The sample (19.14%) reveals a critical care gap in Primary Care. substantially compromising the quality of care provided. This scenario challenges the guidelines established by the Ministry of Health (2019), which advocate diagnosis Early intervention, through the provision of rapid tests, is a key strategy for success. clinical course of tuberculosis.

Furthermore, the assessment of behavioral risk factors, although it presents apparently low prevalences of smoking (10.63%) and alcoholism (2.12%) require Strict caution is advised, given that the literature indicates these substances as direct predictors of therapeutic failures and reduced host immune response. As demonstrated by Studies by Moraes et al. (2024) and Vasco et al. (2023) show that the use of these agents interferes. negatively impacting treatment outcomes, which requires rigorous monitoring. in any structured care plan for the elderly population.

In this context, the negative impact of tobacco and alcohol on treatment adherence. This constitutes an obstacle that can be overcome through educational interventions aimed at elderly patient behavior. This integrated approach, aligned with the recommendations of National guidelines and findings from Brazilian researchers allow for technical discussion. transcend mere statistical description, offering a proactive perspective aimed at Improving tuberculosis management in communities and effectively reducing morbidity and mortality.

DISCUSSION

Intensified therapeutic monitoring is imperative in the management of tuberculosis (TB). in patients with diabetes mellitus (DM), since this association substantially increases the

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risk of treatment failure and unfavorable clinical outcomes. This vulnerability requires Continuous monitoring not only of the bacterial load, but also of stability. metabolic, ensuring that the drug regimen achieves the necessary effectiveness in organisms with a compromised immune response.

Additionally, the literature reinforces that the presence of comorbidities requires a holistic approach. that goes beyond infection control, integrating glycemic control with medication adherence, recognizing that the chronicity of diseases demands coordinated care that includes The biopsychosocial particularities of the elderly. The complexity of this scenario is amplified by Atypical presentation of the disease in senescence, reinforcing the importance of further investigations. detailed that take into account the dynamic interactions between the physiological process of aging and chronic diseases, as highlighted by studies on multiple factors. Causes of death and the analysis of concepts in geriatrics.

The high rate of HIV tests not performed or with missing records in The sample (19.14%) reveals a critical care gap in Primary Care. compromising the quality of care. This scenario challenges the guidelines of the Ministry of... Health (2019), which advocate early diagnosis and the provision of rapid tests as cornerstones. fundamental to the success of the clinical course of TB.

In parallel, the analysis of the patient profile in Abaetetuba/PA reveals a predominance of males and in the 60-64 age range, findings that are consistent with the evidence. de Eduardo et al. (2016) and Bhering et al. (2005), who also identified greater Susceptibility of men and younger elderly people to the resurgence of latent infections. or reinfections. Finally, the assessment of behavioral risk factors, although it presents apparently low prevalences of smoking (10.63%) and alcoholism (2.12%) require Caution is advised, as the literature indicates that these substances are predictors of therapeutic failure and reduction in the host's immune response.

As demonstrated by Moraes et al. (2024), Vasco et al. (2023) and other researchers, The use of these agents negatively interferes with the outcome of the treatment. In this context, the The negative impact of tobacco and alcohol on treatment adherence constitutes an obstacle that This can be overcome through educational interventions focused on the patient's behavior. elderly.

This integrated approach, aligned with the recommendations of national guidelines and to studies by Pereira et al. (2016) and Lourenço and Lopes (2006) on the association between Comorbidities and senescence allow the technical discussion to offer a perspective.

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morbidity and mortality.

CONCLUSION

The epidemiological investigation conducted in the municipality of Abaetetuba, Pará, in
The period from 2019 to 2023 allowed for the characterization of the clinical-demographic profile of the elderly.
affected by tuberculosis. The results showed a predominance of the disease.
In the 60-64 age group and in males, findings corroborate the current literature.
Regarding the susceptibility of senile aging to the recurrence of latent infections. Such
The data reinforces the urgent need for public health policies adapted to...
Specificities of old age, considering the physiological process of immune decline.
and the cumulative exposure throughout the course of life.

The analysis also revealed a significant prevalence of diabetes mellitus (29.78%) in
The sample studied consolidates this comorbidity as a determining risk factor for the
Active tuberculosis in this population. The association between the pathologies, frequently
The so-called TB/DM synergy poses substantial challenges to clinical practice, since...
Metabolic instability negatively interferes with the therapeutic response. Consequently,
It becomes imperative to establish integrated care protocols that overcome the
Focus exclusively on infection control and prioritize coordinated metabolic management to reduce
Unfavorable outcomes and morbidity and mortality in the elderly group.

A critical gap in care was identified in the local Primary Care system, as evidenced by...
due to underreporting or the absence of testing records for the immunodeficiency virus.
Human (HIV) transmission occurs in 19.14% of cases. This scenario points to a weakness in monitoring.
from the guidelines of the Ministry of Health, which advocate early diagnosis and testing
rapid development is an indispensable pillar for the successful clinical course of tuberculosis. The omission of this...
The procedure compromises not only the quality of individual care, but also the
effectiveness of epidemiological surveillance strategies aimed at reducing transmission and
timely treatment of co-infections.

Finally, although the prevalences of smoking (10.63%) and alcoholism (2.12%) have
Although recorded at low levels, the interpretation of this data requires academic caution.
given that such habits are recognized in the literature as direct predictors of failure.
therapeutic and reducing the host's immune competence. It is concluded, therefore, that

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Improving health indicators in Abaetetuba/PA requires an approach

multidisciplinary and proactive, based on educational interventions that include

The biopsychosocial particularities of the elderly, ensuring coordinated, continuous and...

aligned with contemporary scientific evidence.

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