Research Article ISSN 2641-4333

Neurology - Research & Surgery

Evaluation of the Epidemiological Profile of Elderly Patients with Neurodegenerative Diseases in a University Clinic in Belo Horizonte

Nascimento Laura Rodrigues Fonseca[1] and Rezende Cíntia Horta[2]*

[1]*Faculdade Ciências Médicas de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil.*

[2]*Hospital João XXIII, Belo Horizonte, Minas Gerais, Brazil.*

***Correspondence:**
Cíntia Horta Rezende, Av. Prof. Alfredo Balena, 189 – 10th and 11th floor – Santa Efigênia, Belo Horizonte – MG, ZIP Code: 30130-100, Brazil, Phone: +55 (31) 99348-8232.

Received: 24 Apr 2025; **Accepted:** 20 May 2025; **Published:** 30 May 2025

Citation: Nascimento Laura Rodrigues Fonseca, Rezende Cíntia Horta. Evaluation of the Epidemiological Profile of Elderly Patients with Neurodegenerative Diseases in a University Clinic in Belo Horizonte. Neurol Res Surg. 2025; 8(1): 1-4.

ABSTRACT

Introduction: *Brazil's population is aging rapidly, with an increase in the number of elderly people and the prevalence of chronic and neurodegenerative diseases. Due to their greater physical frailty and compromised vital functions, the demand for medical care is also rising.*

Objective: *To outline the epidemiological profile of elderly patients with neurodegenerative diseases attended at a university outpatient clinic, analyzing their demographic characteristics and clinical patterns, based on the review of medical records.*

Methods: *This is a retrospective, unicentric, cross-sectional study, carried out based on the analysis of the medical records of elderly people diagnosed with neurodegenerative diseases in a university outpatient clinic, from January to December 2023.*

Results: *The medical records of 96 patients were analyzed, with a mean age of 82 years (SD = 6.34). The main comorbidities observed were systemic arterial hypertension (68%), dyslipidemia (48%) and diabetes mellitus (25%). Furthermore, 32% of patients reported a history of smoking and 30% reported alcohol consumption. Alzheimer's Disease was the most prevalent condition (54%), followed by Parkinson's Disease (39%).*

Conclusion: *The results demonstrated that the majority of patients analyzed have a high prevalence of comorbidities, mainly systemic arterial hypertension, dyslipidemia and diabetes mellitus, highlighting the importance of multidisciplinary care and strategic planning for prevention and health promotion in this age group.*

Keywords
Neurodegenerative Diseases, Comorbidity, Prevention.

Introduction
The growth of the elderly population is a global phenomenon [1]. In present-day Brazil, the "demographic transition" is characterized by a slowdown in population growth, with declining fertility and birth rates, reduced mortality, and increased average life expectancy.

In 2000, the population aged 60 years or older was 14.5 million people. Currently, this number is close to 29 million, with a tendency toward exponential growth, as it is estimated that by 2060, about 73 million people will be elderly [2]. In 2019, life expectancy rose to 76.6 years: 73.1 years for men and 80.1 years for women [3]. The proportion of people over 65 in the total population increased from 4.5% in 1990 to 13% in 2021 and is expected to reach 22% by 2050 [4].

This phenomenon is neither sudden nor unexpected, as it results from demographic changes that began in the early 21st century. There has been an absolute and proportional increase in the number of long-lived individuals [5]. Significant advances have been made in preventive medicine and in healthcare programs targeting the elderly, improving diagnosis and treatment of chronic-degenerative and infectious diseases, with a consequent improvement in the quality of life of this age group [6].

With population aging, health issues emerge that challenge healthcare systems and social security [7]. Increased longevity is changing the country's epidemiological profile, with a rise in non-communicable chronic diseases and a decrease in infectious diseases. This is not an isolated fact; it is invariably associated with changes in the epidemiological profile and the social and economic characteristics of populations [1,8,9].

Aging is a natural physiological process, involving morphological, functional, biochemical, and psychological changes, leading to impaired autonomy and adaptation to the external environment, with increased susceptibility and vulnerability to diseases [10]. Moreover, a higher number of different conditions per individual is observed in this age group [11]. There is a shift in the epidemiological profile, especially with an increase in chronic non-communicable diseases (NCDs), which are more common in older age groups [12].

The rise in the elderly population, within the public health scenario, translates to an increase in chronic and degenerative diseases, often requiring long and costly treatments [13]. Older adults tend to use health services more frequently, presenting higher hospitalization rates and longer hospital stays than other age groups [5]. They represent 42% to 52% of admissions to intensive care units and account for approximately 60% of hospital bed usage [14]. Between December 2010 and December 2020, there were nearly 51,000 hospitalizations due to neurodegenerative diseases, about 570,000 hospital bed days, and just over 3,000 registered deaths [15].

Neurodegeneration is debilitating and incurable, and its prevalence has been exponentially increasing in the global scientific literature [16]. Neurodegeneration negatively impacts the daily lives of older adults, particularly in tasks requiring motor skills, cognitive capacity, swallowing, and speech [17]. Due to neuronal loss, there is a consequent decline in skills that leads to frailty in the elderly [18].

Given the significant increase in the number of elderly individuals diagnosed with neurodegenerative diseases in recent years, the objective of this study was to evaluate epidemiological data of these patients, treated at a referral outpatient clinic between January and December 2023. Data collection was performed using electronic medical records, seeking to correlate frailty profiles with diagnoses and clinical characteristics observed in this age group.

Methods

Study Design

This is a retrospective, single-center, cross-sectional study conducted at a referral outpatient clinic for neurodegenerative diseases located in Belo Horizonte, Minas Gerais, Brazil.

Sample

The sample included patients diagnosed with neurodegenerative diseases, including Alzheimer's Disease, Lewy Body Dementia, Vascular Dementia, and Parkinson's Disease, who were treated at the outpatient clinic between January and December 2023. Exclusion criteria included patients under 60 years old and those who died during the study period.

Instruments

Data were collected from the analysis of electronic medical records registered in the clinic's information system. It is important to note that only the researchers had access to the records, and no photographs of the records were allowed.

Procedures

Over a three-month period (August to October 2024), the selected medical records were analyzed by the researchers. The following patient data were collected: age, sex, marital status, educational level, associated comorbidities (including depressive disorders and mild cognitive impairment), smoking and alcohol history, physical activity, hospitalizations in the past 12 months, fall g, and diagnoses of neurodegenerative diseases, such as dementia and Parkinson's disease.

Statistical Analysis

Data were entered into an Excel® database, including patient record numbers and clinical data. Simple frequencies and percentages were calculated to provide an overview of the observed proportions in each category. Frequency tables (absolute and relative) were prepared to facilitate group and variable comparisons. Median and interquartile range were used to describe central tendency and data dispersion. For statistical analysis, the Wilcoxon Signed-Rank Test was used to compare medians between two related groups, while Fisher's Exact Test and the test of independence were used to assess associations between categorical variables.

The study was approved by the Research Ethics Committee, in accordance with Resolution 466/12 of the Brazilian National Health Council (CAAE: 81572224.5.0000.5134).

Results

Electronic medical records of 96 patients treated at a university outpatient clinic in Belo Horizonte between January and December 2023 were analyzed.

The average age was 82 years, with a predominance of individuals over 70. Most patients were female and had low educational attainment, with less than four years of formal education. Regarding marital status, most were married, although cases of widowhood,

divorce, and single status were also recorded (Table 1).

Table 1: Sample characteristics (n = 96).

Variable	Category	N (%)
70 years old	Over	82 (85%)
	Under	14 (15%)
Sex	Feminine	60 (63%)
	Masculine	36 (38%)
Education	Over 4 years	19 (43%)
	Under 4 years	25 (57%)
Marital Status	Married	53 (55%)
	Divorced	14 (15%)
	Single	11 (11%)
	Widower	18 (19%)

A high frequency of comorbidities was observed, especially cardiovascular and metabolic diseases, such as systemic arterial hypertension, dyslipidemia, and diabetes mellitus. Other relevant conditions were also identified, including heart failure, stroke, osteoporosis, and depressive symptoms, all of which significantly impact patient functionality and quality of life (Table 2).

Table 2: Prevalence of comorbidities in the sample (n = 96).

Condition	Yes	No
Systemic Arterial Hypertension	65 (68%)	31 (32%)
Diabetes Mellitus	24 (25%)	72 (75%)
Dyslipidemia	46 (48%)	50 (52%)
Coronary Artery Disease	6 (6,3%)	90 (94%)
Heart Failure	16 (17%)	80 (83%)
Stroke	8 (8,3%)	88 (92%)
Malignant Neoplasms	4 (4,2%)	92 (96%)
Chronic Kidney Disease	9 (9,4%)	87 (91%)
Dyspepsia	15 (16%)	81 (84%)
Gastrointestinal Symptoms	13 (14%)	83 (86%)
Benign Prostatic Hyperplasia	5 (5,2%)	91 (95%)
Osteoporosis	23 (24%)	73 (76%)
Epilepsy	7 (7,3%)	89 (93%)
Deep Vein Thrombosis	3 (3,1%)	93 (97%)
Depression	35 (36%)	61 (64%)
Mild Cognitive Impairment	28 (29%)	68 (71%)

Concerning lifestyle habits, a considerable portion of the sample reported a history of smoking and alcohol consumption. In addition, a low level of adherence to regular physical activity, a history of falls, and hospitalizations in the past year were identified.

Discussion

Clinical Profile

This study allowed for the characterization of the clinical and epidemiological profile of elderly individuals with neurodegenerative diseases treated at a university outpatient clinic, highlighting relevant factors for understanding the vulnerability of this population [19].

The predominance of patients over 70 years of age supports the literature indicating aging as the main risk factor for conditions such as Alzheimer's and Parkinson's disease. The predominance of female patients observed in this study is also consistent with epidemiological data associating increased life expectancy and hormonal changes with a higher risk of dementia among women [20].

Advanced age is a significant risk factor for the onset and progression of neurodegenerative diseases such as Alzheimer's and Parkinson's, emphasizing the need for continuous, specialized care for this population. Low educational attainment emerged as a critical factor, as it is linked to lower cognitive reserve and a greater risk of cognitive decline. It also negatively impacts treatment adherence and the understanding of medical instructions, complicating disease management of patients with neurodegenerative diseases [21].

The most prevalent comorbidities were chronic non-communicable diseases, notably cardiovascular and metabolic conditions. This association reinforces the role of systemic inflammation and vascular dysfunction in the neurodegenerative process, as widely discussed in the scientific literature. The presence of heart failure and stroke may further worsen cognitive and motor deficits in these patients [22].

The most prevalent neurodegenerative diseases in this study were Alzheimer's Disease and Parkinson's Disease. These are the most common among the elderly, with a major impact on quality of life. Alzheimer's causes significant cognitive deficits, especially in recent memory, and is linked to genetic and environmental factors. Parkinson's Disease, which severely affects motor control, is associated with aging. Their high prevalence underscores the importance of early diagnosis and effective therapeutic strategies, as neither condition has a curative treatment.

Another noteworthy finding was the high frequency of depressive symptoms, a condition often underdiagnosed in this population. The overlap between depressive manifestations and neurological symptoms makes accurate diagnosis more difficult and can aggravate the clinical course of the disease [23].

Another relevant finding was low adherence to regular physical activity. Regular physical activity promotes neurogenesis, particularly in the hippocampus, a brain area responsible for learning and memory. Additionally, evidence suggests that exercise reduces cognitive decline associated with aging [24]. Exercise also decreases pro-inflammatory cytokines and increases anti-inflammatory substances, potentially attenuating neurodegeneration. The low adherence observed underscores the need for strategies to promote physical activity in this population [25].

Conclusion

This study showed that elderly patients with neurodegenerative diseases treated at a university outpatient clinic in Belo Horizonte exhibit a clinical profile characterized by a high prevalence of comorbidities, especially cardiovascular and metabolic diseases,

and frequent depressive symptoms.

The clinical profile of the patients studied aligns with current scientific literature; however, some limitations were observed: the study was limited to a population treated at a single university outpatient clinic, and there was no data on the longitudinal clinical evolution of these patients.

The most frequently diagnosed neurodegenerative diseases were Alzheimer's and Parkinson's, reflecting national trends and reinforcing the importance of early diagnosis and effective treatment strategies to slow disease progression. A multidisciplinary and integrated approach is recommended to address and manage comorbidities, aiming to improve the prognosis and quality of life of these patients. Moreover, health promotion focused on physical activity and strengthened social support is fundamental to improving the quality of life and reducing the impact of neurodegenerative diseases in the elderly population.

References

1. De Faria Chaimowicz FC. O envelhecimento populacional brasileiro. Pista Periód Interdiscip. 2022; 4: 6-26.
2. De Oliveira NF. Aumento da velhice e seu paralelo com o desenvolvimento sustentável um breve estudo de caso do crescimento desta população no município de Antonina litoral do Paraná. Rev Gest Sust Ambient. 2020; 9: 320-332.
3. Jardim PCBV, Jardim TDSV. Chronological age or biological age, mainly a matter of lifestyle. Arq Bras Cardiol. 2021; 117: 463-464.
4. Peroni DG. The future of the elderly population in Brazil. Rev Bras Geriatr Gerontol. 2023; 26: 441-450.
5. Anna Claudia Santos Amaral, Claudia Medina Coel, Maria do Carmo Esteves Costa, et al. Perfil de morbidade e de mortalidade de pacientes idosos hospitalizados. Cad Saude Publica. 2004; 20: 1617-1626.
6. Fries AT, Pereira DC. Teorias do envelhecimento humano. Rev Contexto Saude. 2011; 11.
7. Miranda GMD, Mendes ADCG, Silva ALA. Population aging in Brazil: current and future social challenges and consequences. Rev Bras Geriatr Gerontol. 2016; 19: 507-519.
8. Vanpee D, Swine C, Vandenbossche P, et al. Perfil epidemiológico de pacientes idosos atendidos em um pronto-socorro de hospital universitário brasileiro. Rev Med. 2018; 97: 44-50.
9. Da Silveira PA, Silva SC, Rocha KSC. Prevalência da polifarmácia nos idosos de uma unidade básica de saúde no estado de Minas Gerais. Rev Aten Saude. 2018; 16.
10. Bacha ML, Perez G, Vianna NWH. Terceira idade uma escala para medir atitudes em relação a lazer. In Anais do Encontro da ANPAD – ENANPAD. Salvador. 2006; 1-10.
11. Brioux T, Woopen C, Zank S. Multimorbidity in old age and its impact on life results. Z Gerontol Geriatr. 2021; 54: 108-113.
12. Carneiro JAC. Prevalência de doenças crônicas não transmissíveis em idosos. Rev Bras Epidemiol. 2016; 19: 76-84.
13. Jobim EFD, Sousa VOD, Cabrera MAS. Causas de hospitalização de idosos em dois hospitais gerais pelo Sistema Único de Saúde (SUS). Acta Sci Health Sci. 2010; 32.
14. Piuvezam G. O impacto da saúde pública no aumento da longevidade no Brasil. Rev Saude Publica. 2015; 49: 69-80.
15. Guedes da Paz E. Doenças neurodegenerativas em adultos e idosos um estudo epidemiológico descritivo. Rev Neurocienc. 2021; 29: 1-11.
16. Luchesi BM. Neurodegeneration and aging epidemiology and consequences. Neuroepidemiology. 2018; 50: 79-84.
17. Rech A. The impact of neurodegenerative diseases on daily living functions. J Neurosci. 2022; 42: 152-159.
18. Hoogendijk EO. Frailty and its relationship with neurodegenerative diseases. J Aging Health. 2019; 31: 1242-1256.
19. Culig L, Chu X, Bohr VA. Neurogenesis in aging and age-related neurodegenerative diseases. Ageing Res Rev. 2022; 78: 101636.
20. Fisher DW, Bennett DA, Dong H. Sexual dimorphism in predisposition to Alzheimer's disease. Neurobiol Aging. 2018; 70: 308-324.
21. Baumgaertel J, Haussmann R, Gruschwitz A, et al. Education and genetic risk modulate hippocampal structure in Alzheimer's disease. Aging Dis. 2016; 7: 553-560.
22. Youwakim J, Girouard H. Inflammation a mediator between hypertension and neurodegenerative diseases. Am J Hypertens. 2021; 34: 1014-1030.
23. Pagonabarraga J, Álamo C, Castellanos M, et al. Depression in major neurodegenerative diseases and strokes a critical review of similarities and differences among neurological disorders. Brain Sci. 2023; 13: 318.
24. Liu PZ, Nusslock R. Exercise-mediated neurogenesis in the hippocampus via BDNF. Front Neurosci. 2018; 12: 52.
25. Seo DY, Heo JW, Ko JR, et al. Exercise and neuroinflammation in health and disease. Int Neurourol J. 2019; 23: S82-S92.