

The main neurologic diagnoses from a neurology outpatient clinic in Rio de Janeiro, Brazil

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Abstract

This study aims to evaluate the prevalence, distribution and clinical profile of neurological diseases and syndromes from a neurology outpatient clinic in the city of Rio de Janeiro. This is a quantitative, cross-sectional study. 180 medical records of first-time visits conducted through 18 months were analyzed. Age, gender and comorbidities were collected to identify the sample's profile and the neurological diagnoses found were classified in predefined groups of syndromes according to the ICD-10 classification, which were further stratified according to age and gender. 157 (87,2%) of the patients had a neurological disease, of which the mean age was 51,05 years and 67,5% were women. The most frequent comorbidities were: hypertension (55,6%); dyslipidemia (20,4%); and diabetes (14,6%). The most common neurological diseases were: Sequelae of Cerebrovascular Disease (12,7%); Unspecified Dementia (8,9%); and Migraine without Aura (7,6%). The main neurological syndromes were: Headache (24,8%); Dementia (15,9%); Cerebrovascular Disease (13,4%); Movement Disorders (12,1%); and Radiculopathy (10,8%). The age and gender profile of these syndromes was further described. These data contribute to better understand the distribution of neurological diseases in the neurological outpatient setting.

Introduction

Neurological diseases impose a high economic and social burden and, currently, affect more than a billion people worldwide¹ and are expected to be more prevalent due to the global trend of population aging.²

Several studies have evaluated the profile of patients treated in outpatient neurology clinics, however, in addition to the great heterogeneity of findings, few studies

have been conducted in Brazil. These investigations, mainly in Latin American, African and Asian countries, show a variable prevalence of Headache between 11,4% and 36,1%,³⁻⁸ Dementia Syndrome between 0,7% and 6,8%,^{5,7,9-11} Movement Disorders between 4,9% and 8,2%,^{3,5,10} Radiculopathies between 2,7% and 12,6%,^{4,5,10} and Cerebrovascular Diseases between 3,18% and 57,1%.^{3-8,10,12}

Two Brazilian studies investigated the profile of neurological diseases in an outpatient clinic of this specialty. The first one, conducted in 1996, identified Headache as the main diagnosis (33,48%), followed by Epilepsy (30%), Cerebrovascular Diseases (7,1%), Cranioencephalic Trauma (3,93%) and Polyneuropathy (3,48%).⁸ The second, published in 2017, had a similar pattern with Headache being the most common diagnosis (36,15%), followed by Epilepsy (22,24%), Cerebrovascular Disease (10,6%), Chronic Pain (7,02%) and Parkinson's Disease (5,59%).³ Although both publications agree on the predominance of some conditions, the chronological difference, the lack of other studies in this area and the absence description on the profile of the investigated samples limit comparisons and the establishment of the profile of the most common diseases in neurology outpatient clinics in Brazil.

This study aims to describe the prevalence, distribution and clinical profile of neurological diseases and syndromes in a neurology outpatient clinic in Rio de Janeiro, Brazil.

Materials and Methods

Design

This study is an observational, descriptive and cross-sectional study, conducted through the analysis of medical records of patients seen in the neurology sector of an outpatient-school located in the city of Rio de Janeiro.

Scenario

The Nilza Cordeiro Herdy outpatient clinic provides free medical care and serves as an outpatient clinic-school for medical students at UNIGRANRIO University. In the neurology sector, care is provided by a single neurologist who has overseen the department for four years. Most patients attended at the clinic come from low income neighborhoods situated nearby, but anyone seeking an appointment can have one. There is a preference for the care of adult and elderly patients, and children and

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adolescents are usually assisted in a neuro-pediatric outpatient clinic.

Sample

The medical records evaluated were from visits conducted in the period from September 2015 to February 2017 (18 months). All records were included for analysis, totaling 343 visits. 28 were excluded because they were incomplete. In the end, there were 315 consultations, of which 180 were first-time visits, the object of analysis of the present study.

Variables and method of data collection

First-time appointments were collected independently by three authors, in a structured and standardized way through the interpretation of the medical records contained in the clinic system and tabulated in

a table in Microsoft Excel®. The following variables were collected: age (years), gender (female/male), comorbidities and pathological antecedents, and diagnoses as registered in the ICD-10 code.¹³

Prior to the collection of data from diagnoses, a classification of groups of neurological diseases was created from the divisions already existing in the ICD-10 code, the pathophysiology, and definition of each condition. For example, individuals with an ICD-10 code of G43 (Migraines), G44 (Other Headache Syndromes) and R51 (Headache) were included in the large group of Headache Syndromes. New categories were created for conditions identified during the collection of data that did not belong to a category already established.

Data analysis

The data were later analyzed with IBM SPSS 23®. Quantitative variables (age) were presented as mean \pm standard deviation and qualitative variables (gender, comorbidities and pathological antecedents) as absolute values and percentages.

Results

From the 180 medical charts evaluated, 157 (87,2%) were considered as patients with neurological diseases, 17 (9,4%), psychiatric illnesses and 6 (3,3%) other types of diseases, therefore, both latter ones were discarded from this investigation. Table 1 shows the age and gender of the analyzed sample. Table 2 shows comorbidities and pathological antecedents of this same sample. The patients evaluated had an age range of 14 to 87 years, with a mean age of 51,05 years and a Standard Deviation (SD) of 17,74. It was also observed that 55,4% of the patients were over 50 years of age, and only 15,3% of the sample was less than 30 years old. There was a female predominance in the study population, which was composed of 106 (67,5%) women.

The most common comorbidities and pathological antecedents were hypertension (55,6%), dyslipidemia (20,4%), diabetes mellitus (14,6%), previous smoking (7%) and anxiety disorder, hypothyroidism and current alcoholism (5,7% each).

Table 3 summarizes the main findings regarding the prevalence of neurological diseases by groups as well as the description of the profile of the patient presenting the condition according to age and gender.

The five most frequent diagnoses were: Headache, corresponding to 24,8% of the total, followed by Dementia Syndrome (15,9%), Cerebrovascular Disease (13,4%),

Extrapyramidal Syndrome and Cerebellar Syndrome (12,1%) and Radiculopathy (10,8%).

Headache was the most commonly observed group of neurological disease in the sample studied, being predominant in females and individuals close to 40 years of age. Dementia was more observed in individuals close to 60 years of age and in women.

Cerebrovascular Disease had a mean age of 57 years and prevailed in males. Extrapyramidal and Cerebellar syndromes were more common in women and presented an average age of 60,4 years. The mean age of individuals with Radiculopathy was 51,4 years, being more frequent in males. Epilepsies had a higher frequency in men (66,7%) and mean age of 40,8. Differently from the other groups of neurological diseases, these diseases had a bimodal distribution regarding the age group, with 44,4% of cases occurring in individuals under 30 years of age and 33,3% in those aged over 50 years.

Supplementary Table S1 details the frequency obtained from ICD-10 codes. A total of 62 ICD-10 codes were quantified from the 157 patients treated.

The most frequently diagnosed condition was Sequelae of Cerebrovascular Disease (12,7%), followed by Unspecified Dementia (8,9%), Migraine Without Aura (7,6%), Migraine Without Specification (4,5%), and Parkinson's Disease (5,1%).

Rarer diseases such as Poliomyelitis Sequelae (1,3%), Myasthenia Gravis (0,6%), Multiple Sclerosis (0,6%) and Toxoplasmosis with Cerebral Impairment (0,6%) were also identified. Among the neoplasms found, only two cases were distinguished: one case of Pituitary Adenoma and one case of Benign Orbital Neoplasia, both with a frequency of 0,6% of the total.

Discussion and Conclusions

The analyzed sample of patients was composed of 157 patients with neurological diseases, predominantly of women and individuals with 50 years old or older. The most common groups of neurological diseases were: Headache; Dementia; Cerebrovascular; Extrapyramidal and Cerebellar Syndromes; and Radiculopathies. Individually, the most prevalent diagnoses were Unspecified Cerebral Vascular Sequelae and Non-Specified Dementia, followed by Migraine without Aura and Parkinson's Disease.

Headaches were the main diagnoses found in our study (24,8%), as well as in studies conducted in Cameroon (31,9%)⁵

and in the Brazilian states of Paraná (36,1%)³ and São Paulo (33,5%).⁸ In other investigations, the prevalence of headache was lower than ours, occurring in 11,4% of patients in a neurology service in Zimbabwe,⁷ 15,5% in Saudi Arabia⁴ and 24,7% in Bangladesh.⁶ This condition was more prevalent in women and the mean age of the diagnosed individuals was 40 years, similar to a study with 2233 patients with neurological diseases conducted in Zimbabwe,⁷ whose mean age of patients with Headache was 37,5 years and 63,8% of the cases occurred in women, and a Bangladesh study that identified a higher prevalence in women under 30 years of

Table 1. Sociodemographic data of patients seen at the neurology outpatient clinic (n = 157).

Sociodemographic data	n (%)
Age	
Minimal and Maximum	14 - 87
Mean \pm Standard Deviation	51,05 \pm 17,74
Age distribution	
< 20 years	9 (5,7)
20-29 years	15 (9,6)
30-39 years	17 (10,8)
40-49 years	29 (18,5)
50-59 years	28 (17,8)
60-69 years	37 (23,6)
70-79 years	17 (10,8)
≥ 80 years	5 (3,2)
Gender	
Male	51 (32,5)
Female	106 (67,5)

Numeric data arranged as n (%), except for the lines "Minimum and Maximum" and "Mean \pm Standard Deviation".

Table 2. Comorbidities and pathological antecedents of patients seen at the neurology outpatient clinic (n = 157).

Comorbidities and Pathological Antecedents	n (%)
Hypertension	81 (51,6)
Dyslipidemia	32 (20,4)
Diabetes Mellitus	23 (14,6)
Previous Smoking	11 (7)
Anxiety Disorder	9 (5,7)
Hypothyroidism	9 (5,7)
Current Alcoholism	9 (5,7)
Current Smoking	7 (4,5)
Coronary Artery Disease	5 (3,2)
Depression	5 (3,2)
Osteoarthritis	5 (3,2)
Previous Alcoholism	5 (3,2)
Psychosis	3 (1,9)
Systemic Lupus	3 (1,9)
Osteoporosis	2 (1,3)
HIV Infection	1 (0,6)

age.⁶ These findings are also present in other studies, which reported a female predominance in the diagnosis of Headache and a higher peak of incidence of tension headache and migraine (the two main representatives of this group of diseases) between 20 and 40 years of age.^{11,14} In addition to other factors such as age and regional characteristics, possibly the majority of women in our sample justifies the high frequency of Headache found in our study.

Dementia occurred in 15,9% of the patients in our study, a prevalence higher than the observed in other publications (0,71 to 6,8%).^{5,7-10} A higher frequency of Dementia was observed in women and the mean age of those diagnosed with this condition was 61,3 years, a predominance profile of elderly individuals also found in other investigations.^{7,11} Given this epidemiological characteristic of Dementia, the predominantly young profile of some studies (population over 50 years of age between 23,1% and 37,6%)⁴⁻⁶ may justify the low prevalence found for these conditions in comparison to ours, whose population aged over 50 was 55,4%. Two other studies, that evaluated the prevalence of Dementia Syndromes in their neurology clinics, did not report characteristics of the study population, which makes comparisons faulty.^{9,10} The only Brazilian study that evaluated the prevalence of Dementias in a neurology outpatient clinic identified the prevalence of 0,91%, but did not report the characteristics of its sample and was published in 1996, factors that undermine any inferences.⁸

Cerebrovascular Disease presented a prevalence of 13,4% in our sample, being close to the frequencies found in studies conducted in Araucária, Brazil,³ and in Nigeria⁹ (10,66% and 18%, respectively). Other studies observed discordant values, with a variable frequency ranging from 3,18% to 57,1%.^{4-8,10,12} This diagnosis was more common in men (66,7%), with a mean age of 57,05 years. A similar profile is found in studies conducted in Zimbabwe⁷ and Ghana,¹⁰ whose mean ages of individuals with Cerebrovascular Disease were, respectively, 63,1 and 59 years, however, with female predominance for this diagnosis. A meta-analysis published in 2007 identified that there is a substantial increase in the risk of development of Cerebrovascular Disease with the progression of the age without necessarily having a predilection for a specific gender,¹¹ common finding to our study regarding the most prevalent age and justifying the distinct profile of the individuals affected by the gender observed in our study and in other studies. Two Brazilian studies, one conducted in 1996 and the other in 2017, presented a difference in the prevalence of Cerebrovascular Disease in their samples, with the oldest frequency being 7.1%⁸ and the most recent, 10,7%.³ Most likely, the high frequency of individuals over 50 years old and of important risk factors for cerebrovascular diseases such as hypertension, diabetes, dyslipidemia and smoking justify the high frequency that we found for this condition.¹⁵ Other neurological outpatient studies that

identified Cerebrovascular Disease in their populations did not collect sufficient sociodemographic data for possible inferences.^{4-6,9,12}

The Extrapyramidal and Cerebellar Syndromes presented a frequency of 12,1%, a prevalence higher than the ones found in other studies (1,22% to 8,2%).^{3-6,8-10} In our study, this group of diseases was more frequent in women (63,2%) and presented a mean age of 60,5 years, a profile also found in a Ghanaian publication whose average age was 65 years, with a female predominance.¹⁰ These data agree with those of a systematic review regarding the age profile of the patient with Extrapyramidal and Cerebellar Syndromes but disagree about the most affected gender, being indicated that they are predominant in men.¹¹ Probably the high prevalence of these syndromes found in our study and in the Ghanaian study is justified by the profile of an elderly majority of the obtained samples. On the other hand, investigations carried out in the city of São Paulo,⁸ Saudi Arabia⁴ and in Bangladesh⁶ showed the lowest frequencies of movement disorders (1,22%, 2,31% and 3,3%, respectively), and of these, only two collected sociodemographic data from their samples, which were mostly young, with only 23,1% of the individuals being above 50 years in the Arab study and 30,8% in the Bengali. The study of the municipality of Araucária did not quantify the cases of Extrapyramidal and Cerebellar Syndromes as a group of diseases, however it evaluated Parkinson's Disease, one of the

Table 3. Frequency of neurological syndromes by age group and gender.

Group of Neurological Diseases	Mean age (\pm SD)	Frequencies, n (%)		Total
		Male	Female	
Headache	40,03 (\pm 14,24)	4 (10,3)	35 (89,7)	39 (24,8)
Dementia Syndrome	61,32 (\pm 11,25)	9 (36)	16 (64)	25 (15,9)
Cerebrovascular Disease	57,05 (\pm 15,03)	14 (66,7)	7 (33,3)	21 (13,4)
Cerebellar and Extrapyramidal Syndrome	60,47 (\pm 18,74)	7 (36,8)	12 (63,2)	19 (12,1)
Radiculopathies	51,41 (\pm 10,09)	12 (70,6)	5 (29,4)	17 (10,8)
Mono and Polyneuropathies	64,00 (\pm 11,43)	7 (63,6)	4 (36,4)	11 (7)
Epilepsies	40,78 (\pm 23,79)	6 (66,7)	3 (33,3)	9 (5,7)
Diseases of the Ear and Mastoid Process	60,50 (\pm 9,74)	4 (100)	0 (0)	4 (2,5)
Neuroinfections	43 (\pm 22,86)	1 (33,3)	2 (66,7)	3 (1,9)
Intellectual Disability	23 (\pm 7,21)	1 (33,3)	2 (66,7)	3 (1,9)
Neuroncology	37 (\pm 12,72)	2 (100)	0 (0)	2 (1,3)
Neuromiopathies	37	0 (0)	1 (100)	1 (0,6)
Sleep Disorders	20	0 (0)	1 (100)	1 (0,6)
Demyelinating Diseases	43	1 (100)	0 (0)	1 (0,6)
Congenital Malformations	15	0 (0)	1 (100)	1 (0,6)
Total	51,05 (\pm17,74)	51 (32,5)	106 (67,5)	157 (100)

Numeric data arranged as n (%), unless specified otherwise. Frequencies present in "Male" and "Female" refer to the total number of cases of the respective category of neurological diseases. The absence of equality between the cumulative sum and the total value occurs due to variations in the approximation of the data. SD = Standard Deviation.

most common causes of movement disorders, and found a prevalence of 5,6% in this sample, a result common to ours, in which the observed prevalence was 5,1%.³ Other publications in Zimbabwe⁷ and Bangladesh¹² did not diagnose movement disorders in their samples.

The diagnosis of Radiculopathy was found in 10,5% of our sample, similar to that observed in Cameroon (12,6%)⁵ and higher than the frequencies found in other neurological outpatient studies, whose variation was 1,5 % to 7,7%.^{4,6,8-10} In our study, the majority of individuals with this condition were male (70,6%) and had a mean age of 51,4 years, a profile not yet described in other similar investigations involving outpatient neurology clinics,^{4,6,8-10} however indicated to be 4,2 more frequent in men¹¹ and more common in individuals close to 50 years of age.^{16,17}

Epilepsies occurred in 5,7% of the patients in our study, a prevalence close to that found in studies carried out in Bangladesh (3,7%⁶ and 7,8%)^{6,12} and in Cameroon (9,9%)⁵ and lower than that observed in other investigations (19,8% to 37,7%).^{3,4,7-10} The profile was predominantly male (66,7%), with a mean age of 40,8 years and bimodal distribution, with 44,4% of patients less than 30 years and 33,3% with more than 50 years. Epilepsies are, in general, discreetly more common in men and present the classic bimodal distribution found in our study.^{11,18} One of the reasons that may explain the relatively low prevalence found for Epilepsies is the fact that the outpatient clinic studied treats preferentially adult patients, and consequently fewer children and adolescents, age groups that represent one of the peaks of incidence of this condition. Our study presents some positive points such as the (1) sociodemographic and comorbid description of our population, which was described by few studies and increases the external validity of our findings, (2) evaluation of the profile of patients with the most important neurological syndromes regarding gender and age, (3) classification of diagnoses according to the ICD-10 classification, and (4) description of

an outpatient sample that is poorly reported and needs to be studied. However, we can mention some limitations, such as (1) sample size, which is smaller than that of other studies and may bias the described profile of certain diseases, (2) the use of only one center for data collection, making possible the existence of a regional bias, (3) and the uncertainty about the correct filling of all the medical records evaluated.

In conclusion, our results contribute to a better understanding of the prevalence and distribution patterns of gender and age of neurological diseases and syndromes, as well as a discrete contribution to better understand the profile of patients with neurological complaints. However, future epidemiological studies of greater population reach are important for the definitive establishment of the burden of neurological disease in the Brazilian population.

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