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ECOLOGICAL STUDY OF THE PROFILE OF STROKE IN BRAZIL FROM 20016 TO 2020

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Abstract: Stroke is among the biggest causes of death and disability worldwide. Data on hospitalizations, value and mortality were analyzed in order to understand the impact of the disease on each profile and outline better paths for prevention. An observational, cross-sectional, retrospective study was carried out based on a survey of data from the Department of Information and Informatics of the SUS. The entire national territory was used, dividing by year of care and by gender in the period between January 2016 and December 2020. Search for data regarding the number of hospitalizations, mortality rate and total value. During the period, the highest total cost was R$564424908.01 for males. There were 405099 admissions for males and 370562 for females during the entire period. The highest mortality rate was for females in 2016 with a value of 16.83 and the lowest was for males in 2019, a value of 14.7. Higher costs and higher rates of hospitalizations occur in the male population. It was not possible to pinpoint a direct cause for the higher mortality among women in the period. Both sexes benefit from strategies to prevent the main modifiable risk factors to reduce mortality. Taking advantage of the better potential that Brazil has in terms of public health, we can prevent the number of strokes in the country, which have a high mortality rate and great cost to the State, in addition to considerably improving the quality of life of that part of the population that could come going through these events.

Keywords: Stroke; Risk factors; Prevention; Health Unique System.

INTRODUCTION

Strokes are among the leading causes of death and disability worldwide. [1,2,3]. According to data from the World Health Organization (WHO), about 15 million people have strokes each year, of which one third die as a result of the event itself and most survivors have physical or mental sequelae [4].

Stroke can be defined as a clinical syndrome of acute neurological origin, of sudden occurrence and that leads to signs and symptoms that are related to disorders of focal or global areas of the brain. [5,6,7]. Typical symptoms include unilateral weakness; vertigo; ataxia diplopia and numbness or visual loss [5]. Taking into consideration, the severity and importance of this medical emergency, computed tomography (CT) plays a fundamental role in the diagnosis of stroke. It allows the differentiation between ischemic and hemorrhagic lesions, the assessment of the extent and topography of the lesions, in addition to ruling out differential diagnoses and investigating possible complications. [8, 9,10].

It is important to remember that, although there is a certain degree of recovery after the event, most patients have chronic sequelae that lead to different degrees of disability. Such sequels cause several damages to individuals, whether they are related to sensitive, cognitive and/or motor characteristics, or in relation to functionality, which is the ability to perform everyday activities, such as communication, mobility and learning. This leads to depressive processes, anxiety and restriction to social life, making it impossible to return to the labor market and, primarily, to the individual's quality of life. [7,11,12].

It is also noteworthy that between genders, women have more strokes due to greater longevity and advanced age at the time of onset of the event. In addition, women have a worse outcome in terms of functional recovery, a higher rate of depression, and are more likely to be socially isolated. [13,14].

Among the risk factors, hypertension, hypercholesterolemia, smoking, diabetes mellitus, excessive use of alcohol and atrial fibrillation are included as the main ones. In addition, we observed that at advanced age, the highest rates of death and sequelae occur.

[5,14,15]. Regarding treatment, the importance of working to reduce risk factors is observed, since they demand less costs from the Unified Health System (SUS), in addition to preventing the loss of functionality of the individual.

However, rapid diagnosis and appropriate treatment for each type of stroke is essential to achieve a better prognosis for each patient, as well as rehabilitation programs in conjunction with a multidisciplinary team to obtain better clinical outcomes. [16,17,18,19,20,21].

In this context, the present study aimed to analyze the cases of hospitalizations between genders, in search of a pattern, and mortality rate of the Brazilian population due to stroke, correlating with the amounts spent (costs). By performing the analysis of hospitalization and mortality trends, it is possible to monitor the behavior of the disease between profiles, in addition to optimizing the primary and secondary prevention measures used for its control[22].

METHODS

An ecological study was carried out with secondary, observational, cross-sectional and retrospective data based on information available in the Hospital Information System (SIH) and the Unified Health System (SUS), available on the DATASUS portal (http://www2. datasus.gov.br). Data were obtained for cases of unspecified stroke over a five-year period. Data collection on unspecified stroke was carried out on the DATASUS portal, first accessing the aforementioned website, then the information access area, then health information (TABNET), epidemiology and morbidity, finally, the topic Hospital Morbidity of the SUS (SIH/SUS) was selected. Subsequently, the subject of unspecified stroke was chosen and the geographical coverage of Brazil by Region and Federation Unit. After that, the line was defined as: year of service, column: sex, content: total value,

hospitalizations and mortality rate. The data search steps are described in figure 1.

RESULTS

Based on the data collected through DATASUS, the total cost per unspecified stroke in the period from January 2016 to December 2020 divided by gender was approximately 1 billion and 700 thousand reais. During the entire period, the total cost was higher among the male population, as shown in Table 1.

Regarding the number of hospitalizations, the total in the period surveyed was 775,661. The year 2019 was described as the year with the most hospitalizations, with a number of 163,384 cases. The year with the lowest hospitalization rate was 2020, with 142,565 cases. It can be noted that for the number of hospitalizations, the same trend followed in relation to the total value, with a predominance of the male population over the female, as can be seen in table 2.

As for the mortality rate in the same period, a reversal in this trend was observed. The mortality rate among females was higher than among males in these 5 years. The year 2016 stands out as the highest total mortality rate (16.17) and the year 2019 as the lowest rate (15.05). These data are explained in table 3.

By analyzing tables 1, 2 and 3, it is possible to see that despite the higher cost and number of hospitalizations being among men, the mortality rate is higher among women throughout the period, evidencing worse outcomes in cases for this gender.

DISCUSSION

The results found in relation to the researched period demonstrate the great prevalence and high mortality rate in relation to stroke in the Brazilian territory in both genders. However, it is notable that the highest costs and highest rates of hospitalizations

occur in the male population. This may occur, among other reasons, due to the underutilization of the Unified Health System by men, as well as the low adherence to risk factor prevention programs, as well as the treatment of these factors with medication, such as arterial hypertension and diabetes.[11,23].

Regarding mortality, it is higher among women throughout the analyzed period. This increase has been correlated with higher blood glucose levels and use of oral contraceptives.[24]. Such data corroborate the hypothesis that the female population is more vulnerable to mortality and loss of functionality after a stroke. Most women are still responsible for daily domestic activities regardless of having other jobs. Therefore, the loss of post-stroke functionality directly influences this population, which may lead to higher rates of depression and dependence, since they are mistakenly attributed as incapable because they are no longer able to perform such activities.[4,6,11].

Although women have higher mortality rates in the period from 2016 to 2019, other studies point to a balance of incidence between genders [25,26]. It was not possible to pinpoint a direct cause for the higher mortality among women in the period, as the data can also be masked by the existing relationship between the increase in female mortality with advancing age.[13].

Although they have different prevalences regarding hospitalizations/mortality, both sexes benefit from prevention strategies for the main modifiable risk factors, since they are associated with 90% of the risk of stroke worldwide [5,14,15,27,28]. Among them we can highlight hypertension, smoking, dyslipidemia, diabetes mellitus and obesity.

Regardless of the prevalence in relation to gender, once the event has occurred, it is essential to improve the care system to reduce delays in treatment, thus maximizing the chances of patient survival and reducing sequelae. [16,17,18,20,21,29].

It was not possible to establish a causal relationship between the numbers of hospitalizations in order to justify 2019 as the year with the most hospitalizations and 2020 as the year with the fewest hospitalizations based on currently available studies. Although Brazilian research in vascular neurology has evolved a lot in recent years, there are still countless opportunities for improvement[30].

CONCLUSION

As observed in the present study, Brazil has high rates of hospitalizations and mortality due to hemorrhagic and ischemic stroke. Although there are no tools to objectively relate these data to the number of risk factors, their reduction may lead to a lower number of thromboembolic events, as observed in the studies used as a reference for this article.

It is concluded, therefore, that when analyzing the number of hospitalizations and mortality rate, it is possible to set primary and secondary prevention goals that will aim to reduce this number, consequently also reducing the total amount spent on the disease.

Thus, taking advantage of the best potential that Brazil has in terms of public health, we can act to prevent the number of strokes in the country, which have a high mortality rate and great cost to the State, in addition to considerably improving the quality of life. of that part of the population that could go through these events.

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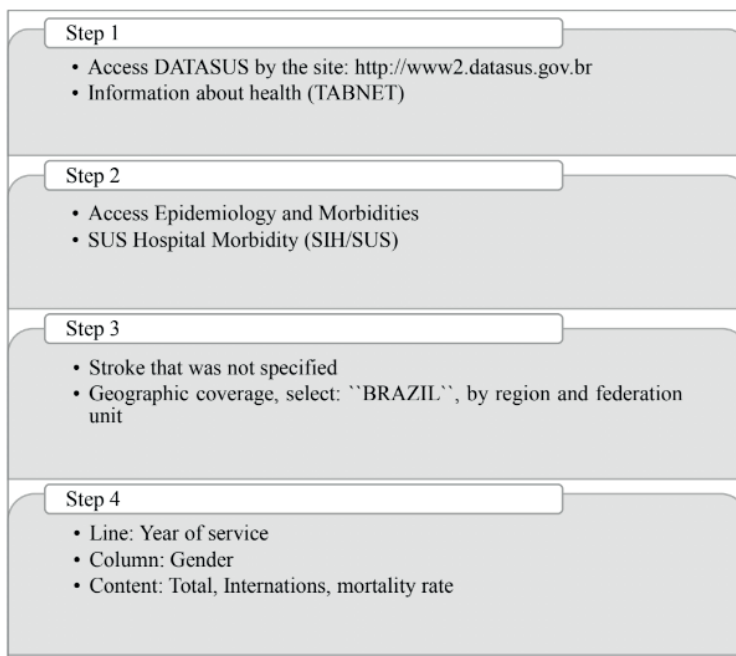
Step 1

- Access DATASUS by the site: http://www2.datasus.gov.br
- Information about health (TABNET)

Step 2

- Access Epidemiology and Morbidities
- SUS Hospital Morbidity (SIH/SUS)

Step 3

- Stroke that was not specified
- Geographic coverage, select: ``BRAZIL``, by region and federation unit

Step 4

- Line: Year of service
- Column: Gender
- Content: Total, Internations, mortality rate

Figure 1: Flowchart for research method in DATASUS.

Source: Author (2021)

Year Service	Male	Female	Total
2016	100678651,65	91250164,01	191928815,66
2017	107987458,03	97860320,95	205847778,98
2018	113529727,89	101869534,86	215399262,75
2019	121305744,96	109564979,83	230870724,79
2020	111288585,78	96283429,78	207572015,56
TOTAL	564424908,01	505525458,05	1069950366,06

Table 1: Total value per year of care and gender; ICD-10 Morb List: Unspecified hemorrhagic or ischemic stroke; Period:2016-2020.

Source: Ministry of Health: SUS hospital information system (SIH-SUS)

Year	Service	Male	Female	Total
2016		77696	71637	149333
2017		79902	73693	153595
2018		82021	75182	157203
2019		85417	77967	163384
2020		75052	67513	142565
TOTAL		405099	370562	775661

Table 2: Hospitalizations by Year and Sex; ICD-10 Morb List: Unspecified hemorrhagic or ischemic stroke; Period: 2016-2020.

Source: Ministry of Health: SUS hospital information system (SIH-SUS)

Year	Service	Male	Female	Total
2016		15,57	16,83	16,17
2017		14,76	16,07	15,39
2018		14,7	15,58	15,12
2019		14,77	15,36	15,05
2020		14,82	15,59	15,18
TOTAL		14,96	15,92	15,42

Table 3: Mortality rate by Year attended and Sex. ICD-10 Morb List: Unspecified hemorrhagic or ischemic stroke; Period:2016-2020.

Source: Ministry of Health: SUS (unified health system) hospital information system (SIH-SUS)