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Research Article

Ischemic Stroke in Young Patients: Prevalence and Comorbidities in the 18 to 45 Age Group.

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Abstract

Objective: To determine the prevalence of the 18 to 45 age group among patients who experienced an ischemic cerebrovascular accident (CVA).
Methodology: A descriptive cross-sectional study of patient records who experienced an ischemic cerebrovascular event, confirmed by a simple cranial tomography. The entire universe of cases from 2022 and 2023 (n=205) was analyzed. Variables studied included sex, age, type of comorbidities, number of comorbidities, grouping of comorbidities, and habits; the statistical analysis included percentages, confidence intervals for percentages, means, and confidence intervals for means.
Results: The prevalence of the 18 to 45 age group that experienced an ischemic stroke relative to the total number of ischemic cerebrovascular accident across all age groups in 2022-2023 was 13.7% (95% CI; 8.9-18.3). Among patients aged 18 to 45 who experienced an ischemic cerebrovascular accident, the most prevalent comorbidity was systemic arterial hypertension at 26.9% (95% CI; 8.6-45.1), with obesity identified at the same prevalence. The 50% (95% CI; 30.8-69.2) of patients aged 18 to 45 who experienced an ischemic stroke reported no history of comorbidity, and 30.8% (95% CI; 13.1-48.5) reported two comorbidities.
Conclusion: The prevalence of the 18 to 45 age group identified here could be considered high; however, it is important to recognize that cerebrovascular events are typically a condition of the elderly. Therefore, the reported prevalence of 13.7% is notable for its socioeconomic impact.

Keywords : prevalence, stroke, cerebral ischemia.

INTRODUCTION

The chronic diseases that comprise metabolic syndrome include systemic arterial hypertension, diabetes, obesity, and dyslipidemia, all of which are on the rise and contribute to the increasing incidence of cardiovascular and cerebrovascular complications.[1,2,3]

Regarding ischemic cerebrovascular events, more than 11 million occurrences have been reported globally, with over half of these taking place in developing countries, including Mexico, where it is one of the leading causes of death. [4,5,6]. While it is well established that the incidence of ischemic cerebrovascular events is higher among older adults, it is also a reality that this pathology occurs in younger populations. The discrepancy lies in defining the age range for this demographic group, with some publications identifying the minimum age as 18 to 20 years and the maximum age ranging from 40, 45, 50, or even 55 years. [7,8,9]

In Mexico, publications report an incidence of ischemic stroke of 77 per 100,000 inhabitants; however, the specific age group affected is not identified. Globally, the incidence in young adults varies by region, with rates ranging from 5 to 40 per 100,000 person-years. In Mexico, available epidemiological information on ischemic CVA in young populations is scarce.[10,11] Therefore, the objective of this project is to determine the prevalence of the 18 to 45 age group among patients who experienced an ischemic stroke.

MATERIAL AND METHODS

A descriptive cross-sectional design was employed for patients who experienced an ischemic cerebrovascular event

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and were treated at the internal medicine service of Regional General Hospital No. 1 in Querétaro during the period of 2022-2023.

The study included records of all patients treated during the specified period who were clinically diagnosed with an ischemic cerebrovascular event and had the diagnosis confirmed by simple cranial tomography. Patients with a history of cerebrovascular events who were admitted for complications associated with clinical sequelae were excluded, as well as those who presented with a hemorrhagic cerebral event.

No sample size calculation was performed because the study included the entire universe of cases from 2022 and 2023 (n=205); no sampling technique was used since the entire universe was included. The sampling frame corresponded to the list of records categorized by ischemic cerebrovascular event available in the clinical archive of the service.

For patients in the 18 to 45 age group, variables such as sex, age, type of comorbidities, number of comorbidities, grouping of comorbidities, and habits were studied. The diagnosis of ischemic cerebrovascular event was confirmed by cranial tomography.

Statistical analysis included percentages, confidence intervals for percentages, means, and confidence intervals for means.

The protocol was registered with the research and ethics committee of the health institution.

RESULTS

The prevalence of the 18 to 45 age group that experienced an ischemic stroke in relation to the total number of ischemic cerebrovascular events across all age groups in 2022-2023 was 13.7% (95% CI; 8.9-18.3). **Table 1** presents the prevalence for each year.

Table 1. Prevalence of the 18 to 45 Age Group with Ischemic Stroke in Relation to the Total Age Groups with Ischemic Stroke.

Year	Prevalence of the 18 to 45 Age Group with Ischemic Cerebrovascular Event	IC 95%	
		Inferior	Superior
2022 (n=119)	12.6%	6.6	18.5
2023 (n=86)	15.1%	7.5	22.6
2022-2023 (n=205)	13.7%	8.9	18.3

Among patients in the 18 to 45 age group who experienced an ischemic cerebrovascular event, females predominated with 53.8% (95% CI; 33.3-74.8), and the average age was 35.53 years (95% CI; 31.39-39.68).

The most prevalent comorbidity was systemic arterial hypertension, with 26.9% (95% CI; 8.6-45.1), and obesity was identified with the same prevalence. **Table 2** presents the prevalence of the remaining comorbidities.

Table 2. Prevalence of comorbidities in patients aged 18 to 45 with ischemic stroke.

Comorbidity	Prevalence (n=26)	IC 95%	
		Inferior	Superior
HTA	26.9	8.6	45.1
DT2	15.3	0.5	30.2
Autoimmune Disease	11.5	0.0	24.7
Arrythmia	7.6	0.0	18.6
Obesity	26.9	8.6	45.1

**Prevalences are expressed as percentages*

The 50% (95% CI; 30.8-69.2) of patients aged 18 to 45 who experienced an ischemic stroke reported no history of comorbidity, while 30.8% (95% CI; 13.1-48.5) reported two comorbidities. This information is presented in **Table 3**.

Table 3. Prevalence of the number of comorbidities in patients aged 18 to 45 with ischemic stroke.

Number of Comorbidity	Prevalence (n=26)	IC 95%	
		Inferior	Superior
0	50.0	30.8	69.2
1	15.4	1.5	29.3
2	30.8	13.1	48.5
3	3.8	0.0	10.2

The most frequent comorbidity association was between hypertension and obesity, with 53.8% (95% CI; 23.1-84.5), followed by hypertension and diabetes, with 42.3% (95% CI; 16.3-68.2); the same prevalence was found for the association between diabetes and obesity. This information is presented in **Table 4**.

Table 4. Prevalence of associated comorbidities in patients aged 18 to 45 with ischemic stroke.

Associated Comorbidities	Prevalence (n=26)	IC 95%	
		Inferior	Superior
HTA + DM	7.7	0	18.6
HTA + OBESITY	15.4	0.5	30.2
DM + ARRYTHMIA	3.8	0	11.7
DM+ OBESITY	7.7	0	18.6
AUTOIMMUNE DISEASE + OBESITY	3.8	0	11.7
ARRYTHMIA + OBESITY	3.8	0	11.7

Smoking was present in 23.0% (95% CI; 5.7-40.4) of patients with ischemic stroke. The prevalence of other habits is presented in **Table 5**.

Table 5. Prevalence of habits in patients aged 18 to 45 with ischemic stroke.

Habits	Prevalence (n=26)	IC 95%	
		Inferior	Superior
Smoking	23.0	5.7	40.4
Alcoholism	15.3	0.5	30.2
Other drugs	3.8	0.0	11.7
Oral contraceptives	3.8	0.0	11.7

DISCUSSION

Globally, an increase in the incidence of cerebrovascular accident (CVA) in young adults has been reported, with a peak around the age of 35. This article analyzed the prevalence of the 18 to 45 age group within the total population that experienced a cerebrovascular event.

The reported incidence of cerebrovascular events in young people across all subtypes ranges from 10% to 15%, with the ischemic type being the most prevalent [12]. This study did not analyze the occurrence of ischemic cerebrovascular events per se but focused on the prevalence of the 18 to 45 age group, which was observed to be 13.7% relative to the total ischemic strokes, offering a different perspective.

Most studies examining the prevalence of CVA in young adults have been conducted in U.S. and European populations. Due to the lack of information on Latin American populations, it is challenging to compare these results with those of this study. However, considering that this study was conducted in a developing country, the 13.7% prevalence may be considered high, providing a benchmark for future research in Latin populations. Additionally, the average age found was 35 years, which, due to its long-term socioeconomic implications, represents a significant public health concern as it involves a key population for a country's development and sustainability.

In this study, hypertension and obesity were the most prevalent comorbidities, each affecting 26.9% of the population. When hypertension and diabetes were combined, as well as obesity and diabetes, the prevalence for both groups was 7.7% of the study population. Moreover, smoking was the most common habit, found in 23.0% of the patients studied. These findings highlight the significant role that these risk factors, as already described in the literature, play in the development of ischemic stroke. Given this scenario, there is a pressing need for further research on ischemic stroke in young populations, including the study of associated factors. These results serve as a red flag for patients with elevated cardiovascular risk, enabling healthcare providers to conduct closer monitoring and early interventions in primary and secondary prevention. The presence of these cardiovascular risk factors suggests a strong association, as described in the literature, between the increase in these risks among young populations and the rising prevalence of ischemic stroke in the studied population. However, it should be noted that this research did not address the association between comorbidities and ischemic stroke.

CONCLUSION

The prevalence of the 18 to 45 age group identified here could be considered high. Nonetheless, it is important to recognize that cerebrovascular events are typically a

condition of older adults. Therefore, the reported prevalence of 13.7% is particularly notable for its socioeconomic impact. It is crucial to increase research on this topic to improve the epidemiological profile of this disease in the Latin American population.

Abbreviations

CVA: Cerebrovascular Accident

Data Availability

The data of clinical record of this patient are available from the author upon request.

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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