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Epidemiology of Patients with Cerebrovascular Accident

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Abstract: ***A stroke, or cerebrovascular accident, is an emergency medical condition characterized by an acute compromise of the cerebral perfusion or vasculature. The leading cause of ischemic stroke is hypertension whereas clotting disorders, carotid dissection, and illicit drug abuse are common causes in the younger populations. A quick diagnosis followed by prompt management needs to be set in motion by the interprofessional team members to improve outcomes for those with stroke. Stroke continues to carry high morbidity and mortality. For those who survive, the recovery is prolonged and the risk of another stroke is high. Most patients following a stroke remain disabled or have partial neurological deficits that prevent them from being active in the workforce.***

Keywords: stroke, etiology, diagnosis, complications, treatment

1. Introduction

Acute ischemic stroke (AIS) is characterized by the sudden loss of blood circulation to an area of the brain, typically in a vascular territory, resulting in a corresponding loss of neurologic function (1). Also previously called cerebrovascular accident (CVA) or stroke syndrome, stroke is a nonspecific state of brain injury with neuronal dysfunction that has several pathophysiologic causes. Strokes can be divided into 2 types: hemorrhagic or ischemic. Acute ischemic stroke is caused by thrombotic or embolic occlusion of a cerebral artery (2). Nearly 800, 000 people suffer strokes each year in the United States; 82–92% of these strokes are ischemic. Stroke is the fifth leading cause of adult death and disability, resulting in over $72 billion in annual cost. Between 2012 and 2030, total direct medical stroke - related costs are projected to triple, to $184.1 billion, with the majority of the projected increase in costs arising from those 65 to 79 years of age (3).

Ischemic and hemorrhagic stroke cannot be reliably differentiated on the basis of clinical examination findings alone. Further evaluation, especially with brain imaging tests (ie, computed tomography [CT] scanning or magnetic resonance imaging [MRI]), is required.

Stroke is the leading cause of disability and the fifth leading cause of death in the United States (4). Each year, approximately 795, 000 people in the United States experience new (610, 000 people) or recurrent (185, 000 people) stroke (5). Epidemiologic studies indicate that 82–92% of strokes in the United States are ischemic.

According to the World Health Organization (WHO), 15 million people suffer stroke worldwide each year. Of these, 5 million die, and another 5 million are left permanently disabled (6). Race - sex - and age - related demographics: In the United States, blacks have an age - adjusted risk of death from stroke that is 1.49 times that of whites (7). Hispanics have a lower overall incidence of stroke than whites and blacks but more frequent lacunar strokes and stroke at an earlier age. Men are at higher risk for stroke than women; white men have a stroke incidence of 62.8 per 100, 000, with death being the final outcome in 26.3% of cases, while women have a stroke incidence of 59 per 100, 000 and a death rate of 39.2%. Although stroke often is considered a disease of elderly persons, one third of strokes occur in persons younger than 65 years (8). Risk of stroke increases with age, especially in patients older than 64 years, in whom 75% of all strokes occur.

2. Material and Methods

This is a prospective study. The study included all patients urgently hospitalized in the Neurology Clinic, in the Regional Hospital of Shkodra district during the period 2010 - 2013. This hospital is a Reference Center for the districts of Malësia e Madhe and Puka, and covers a population of 350, 000 inhabitants. In addition to epidemiological and socio - demographic data, clinical criteria have also been considered. The patients' hospitalization day is also the date of their inclusion in the study. Patients were followed up until their discharge from the hospital and three months after discharge. The time of onset of stroke was determined by interviewing patients and / or family members and persons present at the time the stroke occurred.

3. Statistical Analysis

Data were analyzed with statistical program SPSS 16.0. Continuous variables are presented as mean (M) and standard deviation (SD) and their descriptive statistics. The normality of distribution of continuous variables was tested by the Kolmogorov - smirnov test. Categorical variables are presented in percentage. The Student's t test and analysis of variance ANOVA was used to compare the continuous variables and the hi - square test was used to compare the percentages of the categorical variables. The value of $p \leq 0.05$ is considered statistically significant. Statistical tests are two - tailed.

4. Results and Discussion

The study involved 1203 patients with a mean age of 63.1 (±11.5 years with a range 25 to 84 years. The mean age of males is 63.6 ± 10.6 years while the mean age of females is 62.5 ± 12.5 years with no statistically significant difference between them (t = 1.6 p = 0.09).

536 or 44.6% of cases live in urban areas versus 667 or 55.4% of cases living in rural areas with statistically significant difference between them p <0.05. Table 1 shows the sociodemographic characteristics of patients.

In the study predominate cases in the age group ≥65 years with a statistically significant difference with other age groups (χ^2 goodness of fit = 908.1 p <0.01). From the distribution by gender and age group, there is a predominance of males in each age group with a statistically significant difference with females ANOVA two - way (F = 37 p <0.01). The average time of arrival of patients in the hospital is 4 hours and 20 minutes (minimum 30 minutes - maximum 7 hours) (figure1). In the Framingham and Rochester stroke studies, the overall mortality rate at 30 days after stroke was 28%, the mortality rate at 30 days after ischemic stroke was 19%, and the 1 - year survival rate for patients with ischemic stroke was 77%. However, the prognosis after acute ischemic stroke varies greatly in individual patients, depending on the stroke severity and on the patient's premorbid condition, age, and poststroke complications (9).
A study utilizing the large national Get With The Guidelines - Stroke registry found that the baseline National Institutes of Health Stroke Scale (NIHSS) score was the strongest predictor of early mortality risk, even more so than currently used mortality prediction models incorporating multiple clinical data (10). Cardiogenic emboli are associated with the highest 1 - month mortality in patients with acute stroke.
In late 2018, a new clinical score was developed to identify patients with a high risk of early mortality after an ischemic stroke. Researchers examined data on 77, 653 ischemic stroke patients from the Austrian national stroke unit registry, who were treated between 2006 and 2017. They analyzed a comprehensive list of variables on these patients and compared characteristics in patients who died within the first 7 days after the stroke to those who survived. Multivariate analysis was then performed to ascertain which factors were increasingly associated with early stroke death. Key factors included age, stroke severity measured by the National Institutes of Health Stroke Scale (NIHSS), pre - stroke functional disability (modified Rankin Scale > 0), pre - existing heart disease, diabetes mellitus, posterior circulation stroke syndrome, and non - lacunar stroke cause. Results showed that patients with a score ≥ 10 had a 35% risk of dying within the first few days at the stroke unit (10, 11).

The presence of computed tomography scan evidence of infarction early in presentation has been associated with poor outcome and with an increased propensity for hemorrhagic transformation after fibrinolytic therapy (12 - 15) Hemorrhagic transformation is estimated to occur in 5% of uncomplicated ischemic strokes in the absence of fibrinolytic therapy, although it is not always associated with neurologic decline. Indeed, hemorrhagic transformation ranges from the development of small petechial hemorrhages to the formation of hematomas requiring evacuation.

Acute ischemic stroke has been associated with acute cardiac dysfunction and arrhythmia, which then correlate with worse functional outcome and morbidity at 3 months. Data suggest that severe hyperglycemia is independently associated with poor outcome and reduced reperfusion in fibrinolysis, as well as extension of the infarcted territory (16 - 18). In stroke survivors from the Framingham Heart Study, 31% needed help caring for themselves, 20% needed help when walking, and 71% had impaired vocational capacity in long - term follow - up (19, 20). Patient Education; Public education must involve all age groups. Incorporating stroke into basic life support (BLS) and cardiopulmonary resuscitation (CPR) curricula is just one way to reach a younger audience. Avenues to reach an audience with a higher stroke risk could include local churches, employers, and senior organizations to promote stroke awareness. The American Stroke Association (ASA) advises the public to be aware of the symptoms of stroke that are easily recognized, including the sudden onset of any of the following, and to call for help immediately:

- Numbness or weakness of face, arm, or leg, especially on 1 side of the body
- Confusion
- Difficulty in speaking or understanding
- Deterioration of vision in 1 or both eyes
- Difficulty in walking, dizziness, and loss of balance or coordination
- Severe headache with no known cause

In the spring of 2013, the ASA launched a stroke public education campaign that uses the acronym FAST to teach the warning signs of stroke and the importance of calling for help as follows:

- F: Face drooping
- A: Arm weakness
- S: Speech difficulty
- T: Time to call emergency unit

5. Conclusion

Stroke is a devastating and debilitating disease. It is the second leading cause of death worldwide, exceeded only by ischaemic heart disease and a leading cause of adult disability. Despite the fact that stroke is largely preventable, the global incidence of stroke is rising, there is still relatively low awareness of the risk factors[1], and until recently, stroke has not been seen as a top healthcare priority. There is now increasing pressure on health authorities to focus more on non - communicable diseases, especially heart disease, stroke and diabetes, and introduce more effective measures to prevent stroke and optimise stroke care in line with international guidelines.

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Table 1: Sociodemographic characteristics of patients

Variables	N	%
Gender		
Males	685	56.9
Females	518	43.1
Residence		
Urban	536	44.6
Rural	667	55.4
Agegroup		
25 - 35	2	0.2
35 - 44	66	5.5
45 - 54	204	17
55 - 64	346	28.8
> 65	585	48.6

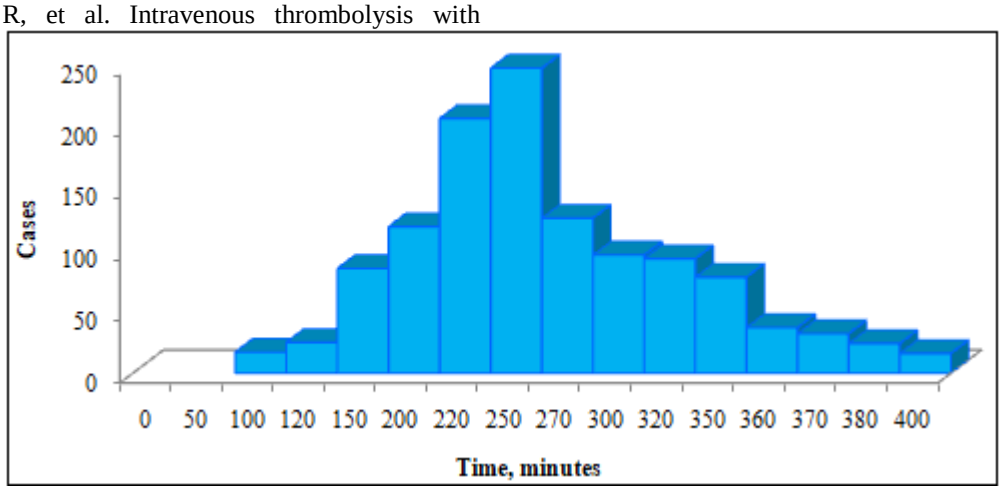

Figure 1: Time from onset of cerebrovascular accident to hospitalization