Clinical Features of Cerebral Stroke Seen at the USFR of Neurology CHU Befelatanana Antananarivo, Madagascar

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Abstract

Introduction: Stroke is a global public health problem. In general, there are 2 types of stroke, ischemic accounting for 80% and hemorrhagic 20% of all strokes. Currently, the opposite of this epidemiological profile is observed in the Neurology Training and Research Unit (USFR) at the Befelatanana University Hospital Center (HUC).

Materials and Methods: We have a descriptive retrospective study conducted at the USFR neurology, CHU Befelatanana from January 1, 2017 to December 31, 2017. We have included all records whose exit diagnosis is a stroke made up with clinical and radiological confirmation.

Results: We selected 201 male-dominated patients, 55% of whom were hemorrhagic and 45% ischemic. The average age of 51.01 for hemorrhagic stroke and 58.58 years in ischemic stroke. Growers are most affected 26.37% (n-24) in ischemic stroke and 35.45% (n-39) of hemorrhagic strokes. The majority of patients live in urban and married settings. Ischemic stroke is predominantly of cardiac origin in 32.86% (n-29) while high blood pressure (HTA) is responsible for hemorrhagic strokes in 66.36% (n -73). The average National Institute of Health Stroke Score (NIHSS) is 15.17 in cerebral ischemia and 18.32 in cerebral hemorrhage. We have 43 deaths of which 17 (17.45%) haemorrhagic fever and 26 (28.57%) ischemic. Survivors after ischemic stroke have a Rankin score ≥ 3 and 45.16% (n-42) of hemorrhagic stroke have a severe disability with Rankin score ≥ 4.

Conclusion: The prevalence of hemorrhagic stroke associated with high blood pressure is the main feature of this pathology at the Befelatanana University Hospital.

Keywords: *Antananarivo; Stroke; Peculiarities*

Introduction

Stroke is defined as a neurological deficit that is usually sudden but sometimes progressive or stroked, of vascular origin [1]. It is a complication of a cardiovascular disease that has been evolving for years. There are two types of stroke. Ischemic stroke accounts for 80% of all strokes involving transient ischemic accidents (TIA) 5% and constituted ischemic accidents called cerebral infarction 75%. The rest is hemorrhagic stroke 20% subdivided into intra-parenchymatous hemorrhage at 15% and meningeal hemorrhage at 5% [1,2]. In Madagascar, comprehensive and reliable statistical data on stroke access are still not available, but stroke is the primary reason for hospitalization in neurology's Training and Research Care Unit (USFR), Befelatanana University Hospital Center (HUC). The prevalence of stroke has been steadily increasing in recent years. We find that in daily practice a change in the epidemiological profile of strokes.

Aim of the Study

And we did this study with the aim of knowing the epidemiological aspect of this pathology and determining their particularity in relation to other countries.

Materials and Methods

This is a retrospective and descriptive study carried out at the USFR of Neurology, CHU Befelatanana. Participants were selected from the medical records of consecutive inpatients from January 01, 2017 to December 31, 2017. We have included all patient records whose discharge diagnosis is a stroke consisting of clinical and scanographic evidence. We excluded the records of patients who came out against medical advice, meningeal haemorrhages and cerebral thrombophlebitis because they are clinical forms of stroke.

In these files, we examined parameters that may have an impact on stroke characteristics including sociodemographic parameters, type of stroke, etiologies, length of hospitalization, hospital evolution and patient fate.

Results

Out of 727 patients registered during the study period, 278 patients diagnosed with a constituted stroke. After inclusion and exclusion criteria, we selected 201 patients, or 27.64% of hospital admissions. Hemorrhagic stroke accounts for 55% (n-110) versus 45% (n-91) of ischemic stroke. Male predominance is found, 52.74% (n-48) with sex ratio 1.1 in ischemic stroke and 51% (n-56), sex ratio 1.03 in hemorrhagic stroke. Patients ranging in age from 26 to 74 with an average age of 51.01 for hemorrhagic stroke and 32 to 86 years with an average age of 58.58 years in ischemic stroke. Stroke predominates in growers 26.37% (n-24) in ischemic stroke and 35.45% (n-39) of hemorrhagic strokes. More than half of patients with hemorrhagic and ischemic stroke live in urban areas. 72.52% (n-66) of patients with ischemic stroke are married as well as hemorrhagic stroke 68.18% (n-75). Regarding etiology, heart disease accounts for 32.86% (n-29) of ischemic stroke followed by indeterminate causes 21.97% (n-20) hypertensive thrust responsible for 66.36% (n-73) of hemorrhagic stroke whose preferred location is at the levels of the central gray nuclei in 66% (n -73). According to clinical manifestations, the average NIHSS score is 15.17 in cerebral ischemia and 18.32 in cerebral hemorrhage. During the 12-month study, we collected 43 stroke deaths, 17 of which (17.45%) haemorrhagic stroke and 26 (28.57%) ischemic stroke. After hospitalization 78.46% (n-52) of survivors after ischemic stroke have a Rankin score of 3 or equal 3 and 45.16% (n-42) only have a severe disability with Rankin score greater than or equal to 3. The average length of hospitalization for patients with hemorrhagic stroke is 10, 64 days and 8.12 days for ischemic stroke.

Discussion

The objective of this study is to determine epidemiological peculiarities from a retrospective, descriptive study at the USFR Neurology, Befelatanana Chul, Antananarivo.

We collected 201 patients in this study. It can be said that stroke is the first reason for hospitalization at the USFR neurology in Antananarivo. It makes up the 28% of all admissions. Stroke is a major public health issue. This is consistent with the literature because it is a global problem in its hospital prevalence and in the general population. The study by E Sagui in sub-Saharan Africa also shows stroke was the leading cause of hospitalization in a specialized neurology department in Senegal, Nigeria, Kabul, Afghanistan, as well as on other continents [1-4].

The prevalence of hemorrhagic stroke was noted in our study compared to ischemic stroke with a significant proportion of 55% versus 45%. Our results corroborate Rasaholiarison's 2015 retrospective study of perforating artery strokes that found the prevalence of hemorrhagic stroke (67.46%) [5]. This could be explained by the existence and lack of awareness of the causal factors of hemorrhagic stroke in our country. This could contrast by the existence of sudden death at home or rapid death in hospital before transfer to neuro-

logy. It is thanks to the grouping of different sources that a population register can be exhaustive, because it is important to remember that between 5 and 10% of strokes are not treated in the hospital [6]. This fundamental data underlines the limitations of purely hospital registries based solely on patients arriving at the hospital. In the literature, the prevalence of hemorrhagic stroke is rarely higher than ischemic stroke. In general, ischemic stroke accounts for 80 - 85% of all strokes and hemorrhagic stroke accounts for 15 - 20%. In fact, in a post-mortem study in Ghana, hemorrhagic strokes accounted for 61% of all strokes. On this study the diagnosis being made at the autopsy, there was an inclusion bias because of the greater mortality of hemorrhagic stroke compared to cerebral infarction. In a Nigerian study, 51% of strokes were hemorrhagic strokes, but the inclusion of patients was based on clinical criteria only. However, no clinical score can replace imaging in determining the type of stroke, ischemic or hemorrhagic. Also, Gambier and his collaborators in Sweden have found a prevalence of hemorrhagic stroke at 50% against 50% of ischemic stroke [7-9].

A slight male predominance was noted regardless of the type of stroke. The sex ratio is 1.1 in ischemic stroke and 1.03 in hemorrhagic stroke. Both sexes are affected almost in the same proportion. Both genders do not have access to sufficient primary stroke prevention given the socio-economic contexts of the country. In addition, men are more reluctant to consult with health professionals and tend to engage in adverse health behaviours. Our results are similar to those of Côte d'Ivoire which brought a male predominance. These results are obvious because according to Andrianarintsoa in 2016, the male gender is associated with the occurrence of hemorrhagic stroke (62.7% with OR-1.2 [0.7 - 2,2]) [10,11]. Yet in African literature there is a variability in prevalence by gender, it is either female or male, but the majority of studies were in favour of a male preponderance with a sex ratio between 1.3 and 1.5 [11,12].

The age of patients with ischemic stroke ranging from 32 to 86 years with an average age of 58.50 years, while hemorrhagic stroke affects patients aged 26 to 74 with an average age of 51.53 years. In our study, stroke mainly affects the young population. In addition, it has been noted that patients with hemorrhagic stroke are younger than patients with ischemic stroke. This could be explained by the predominance of young people in our overall population. This average age is close to that of other Africans ranging from 44.5 years to 61 years or of a predominantly black American population whose average age is around 62 years. Authors who compared the average age of stroke, between subjects of different races, estimate that in white subjects the average age is 77.5 years, while among Latin Americans it is estimated at 65.4 years [13,14].

According to the profession, growers account for 26.37% of ischemic strokes and 35.5% of patients with hemorrhagic strokes. This could be explained by the predominance of farmers in the Malagasy population. The education levels of Malagasy farmers are not able to apply stroke prevention measures, whether ischemic or hemorrhagic. Asa result, growers have mainly toxic habits, especially tobacco and/or alcohol, while tobacco is a risk factor that exposes them to stroke. Indeed, this disease can affect all socio-professional diseases. Even our African author, Mpembi by his studies in Congo, confirms the predominance of growers in 37.1% of his patients [15]. Our results are similar to those of Ngo in Cameroon, which reports that growers are the most observed among patients hospitalized for stroke [6].

More than half of our patients lived in urban areas, including 59.34% of ischemic strokes and 64.84% of hemorrhagic strokes. It reflects the distribution of the global population following rural exodus in our country, in addition to the place where this study is recruited is in urban areas. The predominance of patients from the urban environment could be explained by the proximity of their residence and the place of study. Also, the access or transport of patients from the rural area is often difficult which could explain the low proportion of patients coming from the rural area in our study. According to one study, living in suburban and urban settings increases the risk of hemorrhagic stroke with odds ratio (OR) 4.3 [1.17 - 16] and OR 5.1, respectively. In contrast, the study carried out at St. Luke's Hospital in Kisanto by Mpembi and his team found 43.8% lived in rural areas, 32.6% in urban-rural settings and 23.6 in urban areas. This difference could be explained by the socio-democratic distribution of the population in Congo [15-17].

Married couples are the most stroke victims in both types: 68.18% of patients hospitalized for hemorrhagic stroke and 72.52% of patients hospitalized for ischemic stroke. The age of patients in our study population is mostly in the age range of married patients hence the low single rate. Our results are superimposed on those of Mpembi who found 55.8% married among patients hospitalized for stroke [10].

Regarding etiology, 31.86% of ischemic strokes are of cardiac origin, 21.97% of patients have no etiologies and 18.68% are secondary to atherosclerosis. Embologen heart disease can be said to be the leading cause of stroke in our unit. Etiological research is still difficult in our patients. It is easier to detect embolismal heart disease using an electrocardiography (ECG) that is accessible compared to other tests, given the socio-economic context of our patients. The search for other etiologies requires more means which limit the discovery of other pathologies could be related to ischemic stroke. According to the literature, the etiology of brain infarctions is divided into two groups. In young subjects, arterial dissection is the most common cause. In elderly subjects, it is represented by atherosclerosis. There are large differences in the distribution of etiologies across countries and centres. Despite an in-depth diagnostic inventory, etiology remains unknown or uncertain in 15 to 45% of cases [7,9,11]. On the other hand, hemorrhagic stroke is mostly of hypertensive in 66.36% followed by atypical hemorrhagic stroke of indeterminate etiology in 27.27%. HTA is one of the causes of hemorrhagic strokes. Uncontrolled high blood pressure causes the formation of a micro-aneurysm of Charcot and Bouchard. These micro-aneurysms increase volumes depending on the persistence of high blood pressure, until its ruptures. These are the small deep vessels, directly related to the large vessels that sit the micro-operys. Hypertensive hemorrhagic stroke is found in small perforating vessels. HTA is classified as the most described risk factor and etiology of hemorrhagic stroke in Africa and developed countries. It can be said that the high prevalence of hemorrhagic stroke is related to the high prevalence of uncontrolled HTA in our study population. Pellerin and his team stated in 2003 that high blood pressure is considered a major risk factor for primary brain haemorrhage and that high blood pressure increases the risk of cerebral hemorrhage ten times ten times [18,19].

For all patients hospitalized for ischemic stroke, only 10 had a low NIHSS score of less than 5; the most observed is between 15 to 20 with a maximum score equal to 30 and an average NIHSS score of 15.17. Knowing that the NIHSS score can be used to assess clinical manifestations, the severity of stroke and the prognosis of patients. The score varies between 0 and 45 and allows a rating of motor disorders, sensory, language, cranial pairs and consciousness. NIHSS less than 5 is strongly associated with independence after a stroke. On the other hand, hemorrhagic stroke has a more severe average NIHSS score, 18.32. Clinically, hemorrhagic stroke is more severe with a more pronounced manifestation compared to ischemic stroke. The team of Alderic Perez in Nantes finds an average score 18 which is similar to our study [19].

We have 28.57% of deaths from ischemic stroke and 15.45% of deaths from hemorrhagic stroke. We can say that ischemic stroke is more fatal compared to hemorrhagic stroke. According to the literature, the initial mortality of an ischemic stroke is 23% and hemorrhagic stroke reaches 54%. This relates to the difference in the care of patients in industrialized and underdeveloped countries. The impossibility of thrombolysis in ischemic stroke may explain this difference however for our hemorrhagic stroke the hypertensive cause is less fatal. In France it is estimated that overall mortality from ischemic accident increases with age and that there is a male excess mortality. Early mortality at 1 month is estimated at 20%, between 25 and 40% at 1 year and between 32 to 60% at 3 years. In France, lobar hematoma and anticoagulant hematomas are the most common, management of which is quite difficult compared to hypertensive hematoma [1,4].

We used Rankin's score to assess the initial disability of stroke. Severe disability ranges from 3 to 5. In our study, ischemic stroke gives a severe disability in 78.46% of cases compared to 45.16% in hemorrhagic strokes. We can say that we have a good result compared to literature. Our results are superimposed on those of Yves and his teams who reported a Rankin score above 3 in the majority of cases [10].

Hospitalization is on average 9 days for ischemic stroke and 10 days for hemorrhagic stroke. Our results are far below the literature that found an average hospital stay of 13.6 days in the event of a stroke. The stay in the neurology unit is limited only during the acute phase of the stroke and then the patients are then referred to the rehabilitation unit or at home. The longer stay of a hemorrhagic stroke is related to the tensional stability of patients outside the acute phase. In addition, this difference could be explained by the number of discharges made by the patients because of financial means [5,8,17].

Conclusion

This hospital study makes it possible to appreciate the particular prevalence of hemorrhagic stroke with a proportion of 55%, which is often of hypertensive origin compared to 45% of ischemic stroke. Also medical management, in the absence of thrombolysis or thrombectomy which is a specific treatment leads to a mortality rate comparable with African countries. On the other hand, clinical manifestations and paraclinical data are uncharted. The knowledge of these data prompts us to move forward in a national study in order to have comprehensive epidemiological data for the first time in Madagascar, in order to make better progress in the fight against stroke.

Conflicts of Interest

None.

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