

Epidemiological, Clinical and Computed Tomography Profile of Strokes Observed in the Resuscitation Department of CHU Tambohobe, Fianarantsoa

Rasamoelina N^{1,2*}, Rakotomavo F³, Razafindraibe FAP⁴, Rakotomahenina H², Razafimahatratra R² and Razafimahefa SH²

¹Service of Polyvalent Reanimation, CHU Tambohobe, Fianarantsoa, Madagascar

²University of Fianarantsoa, Fianarantsoa, Madagascar

³Urgences Médico-Chirurgicales, CHU Anosiala, Antananarivo, Madagascar

⁴Urgences Chirurgicales HJRA, Antananarivo, Madagascar

***Corresponding Author:** Rasamoelina N, Service of Polyvalent Reanimation, CHU Tambohobe and University of Fianarantsoa, Fianarantsoa, Madagascar.

Received: November 27, 2017; **Published:** December 16, 2017

Abstract

Objective: To determine the epidemiological, clinical, computed tomography and evolutionary profile of cerebrovascular accidents in the Resuscitation Department of Tambohobe Fianarantsoa Teaching Hospital from January 2015 to September 2017.

Materials and Methods: This was a descriptive, 33-month retrospective study of patients with clinical signs of stroke and confirmed by a brain scan. The following parameters were studied: age, sex, reasons for consultation, risk factors for stroke, tomographic aspect of lesions, evolution and duration of hospitalization. Excel and IBM SPSS Statistics 20.0 were used for data processing.

Results: Three hundred and seventy-five patients were admitted for a clinical presentation of stroke, of which 77 patients underwent a brain scan, i.e. a CT scan rate of 21.7%. The average age was 60.4 years with extremes of 31 years and 93 years. The sex ratio was 1.1. Stroke was predominantly haemorrhagic (64.9%). HTA was the main risk factor (n = 69, 89.6%) followed by alcohol consumption (44.2%) and smoking (33.8). Loss of consciousness was the primary reason for consulting stroke in 67.5% (n = 52). Fourteen patients (18.2%) had a Glasgow score of ≤ 8 with a mortality rate of 71.4. The mean duration of hospitalization was 11.4 ± 9.4 days. The mortality rate was 36.4% (n = 28). Hemorrhagic stroke was the most likely cause of death (p = 0.004).

Conclusion: The epidemiological, computed tomography and evolutionary aspects differ from those of the developed countries. Our patients were young. HTA was the main risk factor. Hemorrhagic stroke was more common and provider of mortality.

Keywords: Stroke; Resuscitation; Tambohobe Teaching Hospital; Fianarantsoa

Introduction

WHO defines stroke as a "rapid" neurodeficial deficit, lasting more than 24 hours, related to focal or global cerebral dysfunction, which may be fatal, the apparent cause of which is vascular [1].

Worldwide, 16 million new cases are observed each year with 5.6 million deaths [2]. A French study found an incidence of stroke for the period 2000-2006 of 113/100 000 inhabitants/year [3]. In Ivory Coast in 2015, the prevalence was 4% [4]. In Madagascar in 2004, a hospital study reported a hospital prevalence of 12.6% [5]. In Fianarantsoa, CT is a recent introduction and to our knowledge, no stroke study has been conducted yet. The objective of this study is to determine the epidemiological, clinical, computed tomography and evolutionary profile of cerebrovascular accidents in the Resuscitation Department of Tambohobe Fianarantsoa Hospital.

Materials and Methods

This was a descriptive retrospective study performed in the Resuscitation Department of the Fianarantsoa Teaching Hospital for a period of 33 months, from January 2015 to September 2017. Patients with clinical signs of stroke and confirmed by a CT scan brain, were included in this study. Stroke was clinically referred to a focal neurological deficit of sudden onset with or without impairment of consciousness. The criteria for non-inclusion were: neurological signs that did not fit the definition of stroke, brain scan results that did not conclude vascular lesions. Ischemic stroke was confirmed by the presence of hypodense in a vascular territory. Hemorrhagic stroke was confirmed in the presence of spontaneous hyperdensity in the cerebral parenchyma, which may or may not diffuse into the subarachnoid spaces.

For this purpose, the following parameters were studied: age, sex, reasons for consultation, risk factors for stroke, tomodensitometric aspect of lesions, evolution and duration of hospitalization.

Data collection was done from the individual survey form. Data entry was done from the Excel software. The data was analyzed using the IBM SPSS Statistics 20.0 software. The Chi-square test was used to investigate the existence of association between two qualitative variables. A difference was considered significant for a value of p less than 0.05.

Results

During the study period of 33 months, 2852 patients were hospitalized for medical conditions in the Polyvalent Resuscitation Department of the Tambohobe-Fianarantsoa Teaching Hospital. Three hundred and seventy-five patients were admitted for a clinical presentation of stroke, i.e. 7.6%. The CT scan rate was 21.7% (n = 77). Of the 77 patients who received a brain scan, 50 (64.9%) had hemorrhagic stroke and 27 (35.1%) had ischemic stroke. The average age was 60.4 years with extremes of 31 years and 93 years. Stroke was predominantly male (n = 41, 53.2%). The sex ratio was 1.1. HTA was the main risk factor (n = 69, 89.6%) followed by alcohol consumption (44.2%) and smoking (33.8). Loss of consciousness was the primary reason for consulting stroke in 67.5% (n = 52). Fourteen patients (18.2%) had a Glasgow score ≤ 8 with a mortality rate of 71.4% (10 deaths out of 14 patients) (p = 0.003). Only 10 patients (13%) received a brain scan within 24 hours after the onset of clinical signs of stroke. Hyperthermia was the main morbidity (n = 33, 42.8%). The mean duration of hospitalization was 11.4 ± 9.4 days. The mortality rate was 36.4% (n = 28). The characteristics of the patients are summarized in table 1. Hemorrhagic stroke was the most likely cause of death (p = 0.004). The mortality of hemorrhagic stroke was 48% (24 deaths out of 50 patients).

Settings	60,4	
Average age (year)	60,4	
	Number (n)	Frequency (%)
Sex n (%)		
Male	41	53,2
Female	36	46,8
Risk Factors n (%)		
HTA	69	89,6
Alcohol	34	44,2
Tobacco	26	33,8
Diabetes	13	16,9
Obesity	7	9,1
hypercholesterolemia	7	9,1
heart Disease	4	5,2
Sedentary lifestyle	3	3,9
Contraception	3	3,9
Reasons for consultation n (%)		
Loss of consciousness	52	67,5
Deficit syndrome	48	32,5
Glasgow score at admission n (%)		
≤ 8	14	18,2
9 - 12	18	23,4
13 - 15	45	58,4
Scanner completion time n (%)		
< 24 hours	10	13
24 - 48 hours	36	46,8
> 48 hours	31	40,2
Stroke types n (%)		
Hemorrhagic	50	64,9
Ischemic	27	35,1
Morbidity n (%)		
Hyperthermia	33	42,8
Hyperglycemia	15	19,5
Hyponatremia	13	16,9
Bedsore	7	9,1
Pneumonia	5	6,5
Mortality n (%)	28	36,4

Table 1: Patient Characteristics (n = 77).

Discussion

This study allowed us to observe that stroke was predominantly haemorrhagic. HTA was the main risk factor. The stroke was engraved with high mortality.

The average age of our patients, 60.4 years, is close to that of African literature. In Côte d’Ivoire and Burkina Faso, studies have reported almost similar results of 60 and 57.7 years, respectively [4,6]. However, this average age is largely young compared to a European meta-analysis made in 2009 which observed an average age of 73 [7]. This could be explained by the higher life expectancy and medi-

calization level in developed countries [6]. The lack of information of the population on risk factors and primary prevention of stroke is a major problem in the developing country.

In our study, on the one hand, the slight predominance of men could be explained by patient recruitment. We only studied stroke confirmed by a brain scan. In African literature, the sex ratio varies from country to country. In Congo in 2013, Mauritania in 2002 and Ethiopia in 2005, studies reported male predominance [8-10]. While in Cameroon in 2008 and in Senegal in 2008, some authors found female predominance [11,12]. On the other hand, the slight male predominance in our study could be explained by smoking and alcoholism, which are more common among men.

In our study, unconsciousness was the primary reason for consultation in 67.5% of strokes. At admission, 18.2% of patients had a Glasgow score of less than or equal to 8. This result is significantly lower than in the literature. In Burkina-Faso in 2014 and in Gabon in 2014, studies reported a respective high frequency of Glasgow scores ≤ 8 of 60.5% and 60% [6,13]. The high frequency of the disorders of the conscience is explained by the violent nature of the affection and the characteristic of its lesional support [14]. In our study, the loss of consciousness could be explained by the early onset of complications such as cerebral edema, engorgement and hydrocephalus.

As in the literature, the main risk factor found was HTA (89.6%). The latter increases the risk of hemorrhagic stroke by 10 and cerebral infarction by 4 [15]. African studies have reported rates of 84.4%, 70.5% and 70.6%, respectively [4,6,14]. In sub-Saharan Africa, hypertension is more prevalent in urban areas than in rural areas due to stress and high-salt diets [16-20]. Studies have found etiopathogenetic peculiarities of arterial hypertension in African black subjects. Indeed, one study has observed the existence of the salt-sensitive phenotype in blacks [21]. In South Africa, in 2003, one study reported low renin activity in South African black hypertensives [22]. In addition, a study in South Africa reported that 32.6% of hypertensive subjects had no treatment [23]. Antihypertensive therapy has been shown to be effective in primary and secondary prevention of stroke [24,25].

In our study, we observed a predominance of hemorrhagic stroke (64.9%). These results are comparable to other work done in Africa. Thus, hemorrhagic stroke accounted for 59.2% of strokes in Ethiopia in 2005 [10] and 60.1% in Tanzania in 2004 [26]. This could be explained by the high frequency of poorly controlled hypertension associated with risk factors in young subjects such as alcohol and tobacco. In developing countries, the difficulty of access to care explains the recrudescence of hemorrhagic stroke. In Ghana, one study reported that because of the cost of the drug, only 7% of hypertensive patients were on treatment [27]. The relative risk of developing haemorrhagic stroke in the ethyl patient is 6. This risk is multiplied by 3 for cerebral infarction [28].

However, in developed countries, ischemic stroke is more common. Thus, Feigin VL, *et al.* [29] reported in their meta-analysis an incidence of ischemic stroke of 67.3 to 80.5%.

After hypertension, alcoholism and smoking were the most common risk factors. These confirm the results of African studies [30,31]. Ethylism and smoking in our study could be explained by socio-cultural reasons. Any socio-cultural event in our region is marked by the excessive consumption of alcohol and tobacco leading certain individuals to adopt it in their daily lives.

The mortality of our patients was 36.4%. In Côte d'Ivoire in 2015, a study reported a lower mortality rate of 17% [4]. Some African authors have reported very high mortality rates of 71.3% and 70.88%, respectively [6,11]. The observed differences would be related to the study setting and the size of the populations studied [6]. On the other hand, the low realization rate of the CT scan of our study constitutes a bias. In our study, the Glasgow score ≤ 8 at the entrance was a factor of poor prognosis. In Cameroon, authors have observed high mortality rates for patients with a Glasgow score < 8 [32,33]. In our study, hemorrhagic stroke was the most likely cause of death. In Côte d'Ivoire and Cameroon, studies have reported higher mortality rates during hemorrhagic stroke compared with ischemic stroke [30,32]. This high mortality rate in our study could be explained by the absence of adapted resuscitation equipment as well as the lack of trained personnel for the specific management of this pathology. Authors have noted that the very high mortality rate reflects the low technical plateau and the lack of surgical management despite massive haemorrhage that could benefit from adequate surgical treatment

that would have improved the prognosis [30,33]. Diallo M., et al. have described poor prognostic factors as a large hemorrhagic volume, a low Glasgow score, and the presence of ventricular haemorrhage on the initial CT scan [34].

For years, studies have shown that neurovascular unit decreases stroke morbidity and mortality in developed countries [35,36]. Indeed, in our context, the creation of a service dedicated exclusively to stroke with staff specifically trained in the management of stroke would reduce the mortality of this pathology.

This study was limited by the small sample size, due to a low rate of completion of a brain scan. In developing countries, access to CT remains difficult because of the prohibitive cost and geographical location [37].

Conclusion

This study has shown that the epidemiological, computed tomography and evolutionary aspects differ from those of the developed countries. Our patients were young. HTA was the main risk factor. Hemorrhagic stroke was more common and provider of mortality. The installation of the scanner at Fianarantsoa improves the knowledge of this pathology and allows practitioners to improve the specific management of this condition.

Bibliography

1. Hatano S. "Experience from a multicentre stroke register: a preliminary report". *Bulletin of the World Health Organization* 54.5 (1976): 541-553.
2. Strong K., et al. "Preventing stroke: saving lives around the world". *Lancet Neurology* 6.2 (2007): 182-187.
3. Béjot Y., et al. "Dijon's vanishing lead with regard to low incidence of stroke". *European Journal of Neurology* 16.3 (2009): 324-329.
4. N'goran YN., et al. "Aspects épidémiologiques des accidents vasculaires cérébraux (AVC) aux urgences de l'institut de cardiologie d'Abidjan (ICA)". *Pan African Medical Journal* 21 (2015): 160.
5. Raveloson NE., et al. "Prise en charge initiale des accidents vasculaires cérébraux dans un centre hospitalier peu équipé". *Medecine d'Afrique Noire* 54 (2007): 10.
6. Bonkounou P., et al. "Aspects épidémiologiques, cliniques, paracliniques, thérapeutiques et évolutifs des accidents vasculaires cérébraux dans le service de réanimation polyvalente du Centre Hospitalier Universitaire Yalgado Ouédraogo au Burkina-Faso". *Medecine d'Afrique Noire* 61 (2014).
7. Heuschmann PU., et al. "The European Registers of stroke (EROS) Investigators. Incidence of stroke in Europe at the beginning of the 21st century". *Stroke* 40.5 (2009): 1557-1563.
8. Ossou-Nguet PM. "Facteurs de mortalité des accidents vasculaires cérébraux au CHU de Brazzaville". *R.A.M.U.R* 18.1 (2013).
9. Diagana M., et al. "Apport de la tomodensitométrie dans le diagnostic des accidents vasculaires cérébraux à Nouakchott, Mauritanie". *Medecine Tropicale* 62.2 (2002): 145-149.
10. Zenebe G., et al. "Characteristics and outcomes of stroke at Tikur Anbessa Teaching Hospital, Ethiopia". *Ethiopian Medical Journal* 43.4 (2005): 251-259.
11. Behiya Q., et al. "Aspects épidémiologiques et facteurs de gravité des accidents vasculaires cérébraux au Cameroun". *Journal of Magh A Réa Urg* 15.66 (2008): 293-297.

12. Sene DF, *et al.* "Follow-up of comatose stroke in Dakar, Senegal". *Revue Neurologique* 164.5 (2008): 452-458.
13. Eyang B., *et al.* "Study of the prevalence of cerebrovascular accidents in the emergency department of the University Hospital of Angondje". *Rev Afr Anesth Med Urg* 19.2 (2014): 49.
14. Raveloson NE., *et al.* "Epidemioclinical, evolutionary and computed tomography aspects of haemorrhagic stroke (34 cases) at the "Reception Triage Emergency Medical Resuscitation" (ATUR) service of the Joseph Raseta Befelatanana University Hospital (Antananarivo)". *Rev Afr Anesth Med Urg* 3.1 (2011): 15-19.
15. Sacco RL., *et al.* "Risk factors and their management for stroke prevention: outlook for 1999 and beyond". *Neurology* 53 (1999): S15-S24.
16. Schutte R., *et al.* "Differences in the cardiovascular function of rural and urban African males: the THUSA study". *Cardiovascular Journal of South Africa* 15.4 (2004): 161-165.
17. Agyemang C. "Rural and urban differences in blood pressure and hypertension in Ghana, West Africa". *Public Health* 120.6 (2006): 525-533.
18. Opie LH and Seedat YK. "Hypertension in sub-Saharan African populations". *Circulation* 112.23 (2005): 3562-3568.
19. Fourcade L., *et al.* "Hypertension in sub-Saharan Africa. News and perspectives". *Medecine Tropicale* 67 (2007): 559-567.
20. Cooper RS., *et al.* "Hypertension treatment and control in sub-Saharan Africa: the epidemiological basis for policy". *British Medical Journal* 316.7131 (1998): 614-617.
21. Worthington MG., *et al.* "Sodium transport in hypertension: assessment of membrane-associated defects in South African black and white hypertensives". *Journal of Human Hypertension* 7 (1993): 291-297.
22. Rayner BL., *et al.* "A new mutation R563Q, of the b-subunit of the epithelium sodium channel associated with low-renin, low aldosterone hypertension". *Journal of Hypertension* 21.5 (2003): 921-926.
23. Thorogood M., *et al.* "Cross-sectional study of vascular risk factors in a rural South African population: data from the Southern Africa stroke prevention initiative (SASPI) study". *Bulletin of World Health Organization* 7 (2007): 326.
24. Collins R., *et al.* "Blood pressure, stroke and coronary heart disease II: Short-term reductions in blood pressure: overview of randomized drug trials in their epidemiological context". *Lancet* 335.8693 (1990): 827-838.
25. Progress Collaborative Group. "Randomized trial of a perindopril-based blood-pressurelowering regimen among 6 105 individuals with previous stroke or transient ischaemic attack". *Lancet* 358.9287 (2001): 1033-1041.
26. Matuja W., *et al.* "Stroke subtypes in black Tanzanians: a retrospective study of computerized tomography scan diagnoses at Muhimbili National Hospital, Dar es Salam". *Tropical Doctor* 34.3 (2004): 60-62.
27. Buabeng KO., *et al.* "Unaffordable drug prices: the major cause of non-compliance with hypertension medication in Ghana". *Journal of Pharmacy and Pharmaceutical Sciences* 7.3 (2004): 350-352.
28. Hart C., *et al.* "Alcohol consumption and mortality from all causes, coronary heart disease, and stroke: results from a prospective cohort study of Scottish men with 21 years of follow-up". *British Medical Journal* 318 (1999): 1725-1729.

29. Feigin VL., *et al.* "Stroke epidemiology: a review of population-based studies of incidence, prevalence, and case-fatality in the late 20th century". *Lancet Neurology* 2.1 (2003): 43-53.
30. Cowppli-Bony P., *et al.* "Mortalité par accident vasculaire cerebral". *Medecine d'Afrique Noire* 53.5 (2006).
31. Kouna Ndouongo P., *et al.* "Epidemiological features and outcome of stroke at Libreville hospital (Gabon)". *African Journal of Neurological Sciences* 26.2 (2007): 12-17.
32. Callixte KT., *et al.* "Mortalité par Accident Vasculaire Cérébral et ses Déterminants dans un Hôpital de Référence de Douala (Cameroun)". *Health Sciences and Diseases* 17.1 (2016): 1-6.
33. Nkoke C., *et al.* "Stroke mortality and its determinants in a resource-limited setting: A prospective cohort study in Yaounde, Cameroon". *Journal of the Neurological Sciences* 358.1-2 (2015): 113-117.
34. Mahamadou Diallo. "Apport de la tomodensitométrie dans le diagnostic des hémorragies cérébrales de localisation rare au CHU Gabriel Toure de Bamako (MALI)". *Journal of African Images Medicine* 6.1 (2014): 72-78.
35. Langhorne P., *et al.* "Do stroke units save live?" *Lancet* 342.8868 (1993): 395-398.
36. Hommel M and Mémin B. "Pronostic des AVC. Accidents Vasculaires Cérébraux". Doin Ed, Paris (1993).
37. Adoukonou TA., *et al.* "Prise en charge des accidents vasculaires cérébraux en Afrique subsaharienne". *Revue Neurologique* 166.11 (2010): 882-893.

Volume 9 Issue 3 December 2017

© All rights reserved by Rasamoelina N., *et al.*