Anesth Crit Care 2020; 2 (1): 001-007 *DOI: 10.26502/acc.010*

Research Article

Epidemiology and Prognostic Factors of Stroke In Intensive Care Unit at the National University Hospital Hubert Koutoukou Maga (CNHU-HKM) of Cotonou

Hounkpè Pierre Claver[1*], Ahounou Ernest[1], Adjagba Philippe[2], Kiatti Enoch[1], Oke Luc[3]

[1]Anesthesia and Critical Care Service, National University Hospital Hubert Koutoukou MAGA (CNHU-HKM) of Cotonou, Bénin

[2]Service of Cardiology, National University Hospital Hubert Koutoukou MAGA (CNHU-HKM) of Cotonou, Bénin

[3]American Center for Investigative Cardiology (ACIC), USA

[*]**Corresponding Author:** Hounkpe Pierre Claver, Department of Anesthesia and Critical Care, Service of Anesthesia and Critical Care, National University Hospital Hubert K. MAGA (CNHU-HKM), Cotonou, Bénin Republic, West Africa, Tel: +22995953762; E-mail: pierclav@yahoo.fr

Received: 10 January 2020; **Accepted:** 28 January 2020; **Published**: 31 January 2020

Citation: Hounkpè Pierre Claver, Ahounou Ernest, Adjagba Philippe, Kiatti Enoch, Oke Luc. Epidemiology and Prognostic Factors of Stroke In Intensive Care Unit at the National University Hospital Hubert Koutoukou Maga (CNHU-HKM) of Cotonou. Anesthesia and Critical Care 2 (2020): 001-007.

Abstract

Introduction: Strokes are serious neurovascular pathologies and constitute a public health problem due to their high frequency and high mortality rate. The research aim was to assess the prognostic factors of stroke in the intensive care unit of the National University Hospital Hubert Koutoukou Maga (CNHU-HKM) of Cotonou.

Materials and Methods: This was a cross-sectional, descriptive and analytical research with retrospective data collection. It took place in the intensive care unit of the CNHU/HKM at Cotonou over a period of 30 months from January 1, 2015 to June 30, 2017. The cases of stroke confirmed by a brain scanner/ MRI were included.

Results: A total of 109 stroke cases were included in our research and the prevalence was 5.5%. Hemorrhagic strokes were more representative (59.6%). The mean age was 59 ± 14 years, the sex ratio was 1.22. The HBP was the most common risk factor (81.7%). Mortality was 80.07% and

length of stay 8 ± 9 days. The poor prognostic factors were GCS ≤ 8, the presence of neurological and respiratory complications or sepsis.

Conclusions: Strokes in intensive care unit at CNHU/HKM are burdened with a high mortality rate (80.07%). The poor prognostic factors were GCS ≤ 8, the presence of neurological and respiratory complications or sepsis.

Keywords: Stroke; Epidemiology; Prognostic factors; Mortality; Strengthening the technical platform

1. Introduction

Stroke is a sudden deficit in focal brain function with no other apparent cause than a vascular cause [1]. Because of its frequency and severity, it is a public health problem [2]. In fact, it is the leading reason for hospitalization in neurology units, the third cause of death and the first cause of disability in adults worldwide [3, 4]. In Africa, because of changes in eating habits and stress, strokes are becoming more frequent and could be the leading cause of death in 2020 according to the WHO [5]. When the vital prognosis is engaged, its monitoring is done in intensive care units and its management is multidisciplinary, involving the critical care physician, the neurologist, the cardiologist but also the radiologist and sometimes the neurosurgeon. The aim of our work was to determine the prevalence and assess the prognostic factors of stroke in the intensive care unit of the National University Hospital Hubert Koutoukou Maga (CNHU/HKM) at Cotonou.

The specific objectives were to determine the prevalence of stroke in the intensive care unit of the CNHU/HKM, to describe their epidemiological profile and to identify the prognostic factors

2. Materials and Methods

It was a cross-sectional, descriptive and analytical research with retrospective data collection. It took place in the anesthesia and critical care service of the CNHU/HKM at Cotonou over a period of 30 months running January 1, 2015 through June 30, 2017. The source population consisted of all stroke cases admitted to intensive care unit during the research period. The inclusion criteria were: any patient whose clinical diagnosis of stroke was confirmed by brain CT/MRI. The non-inclusion criteria were: any patient whose clinical diagnosis of stroke was not confirmed on brain imaging. The exclusion criteria were: any patient whose diagnosis of stroke was documented but whose record was unusable. The variables studied were: prevalence, socio-demographic, clinical and paraclinical data, evolutionary data and prognostic factors.

Data collection was carried out using a collection form, from the critical care register and patient files. Data was entered into Epi Data software version 3.1 and analyzed using Epi Data analysis version 2.2.2.182. Statistical analysis was carried out using the Pearson Chi2 test with significance threshold for a p value ≤ 0.05. The confidence interval was set at 95%.

3. Results

3.1 Prevalence: We had collected during the research period 168 cases of stroke out of 1967 hospitalizations; only 109 cases of stroke were confirmed by a brain scan, which corresponds to a prevalence of 5.5%.

3.2 Stroke Mechanism: The stroke mechanism was hemorrhagic in 65 patients (59.6%), ischemic in 44 patients (40.4%) including one case of ischemic stroke with secondary bleeding.

3.3 Age: The average age of our patients was 59 ± 14 years with the extremes of 26 and 91 years. Patients under 65 represented 68% of our sample.

3.4 Sex: Sixty patients were male (55%) and forty-nine were female (45%). The sex ratio was then 1.22. In the male population, thirty-nine (65%) had a hemorrhagic stroke, compared to twenty-one (35%) who had an ischemic stroke. Twenty-six (53.1%) of the women had a hemorrhagic stroke and twenty-two (44.9%) had an ischemic stroke. A case of ischemic stroke with secondary bleeding was found in a woman.

3.5 Risk factors: HBP was the most representative risk factor; it is found in 81.7% of our patients. Table 1 shows the general characteristics of stroke patients in intensive care and the risk factors associated with the disease.

3.6 Clinical data of stroke cases in intensive care

3.6.1 Neurological signs: The neurological signs found in our patients are presented in Table 2.

3.6.2 Therapeutic data: The time taken to perform a brain scan in our series exceeded 24 hours in all patients. No case of ischemic stroke benefited for thrombolysis. The treatment of our patients consisted in the management of vital distress and secondary cerebral aggressions of systemic origin (SCASO). Eighty-four patients (77.1%) benefited from mechanical ventilation either for the treatment of respiratory distress or because they are in a profound impairment of consciousness with GCS ≤ 8.

3.6.3 Progressive data: The evolution was favorable in 06 of our patients (5.6%) who were discharged without post-effects. 14 patients (12.8%) had neurological post-effects such as hemiplegia, facial paralysis and dysarthria. They were transferred to the neurology department for further care. 01 patient had left intensive care against medical advice.

3.6.4 Mortality: 88 patients (or 80.07%) of stroke cases had died. The causes of death are summarized in Table 3. The length of stay was on average 8 ± 9 days, with the extremes of 1 and 69 days.

3.6.5 Factors associated with death: The factors associated with death are summarized in Table 4.

Characteristics	**Size (n=109)**	**Percentage (%)**
Sex		
Male	60	55
Female	49	45
Age		
20-35 years	4	4
36-50 years	26	24
51-65 years	44	40
66-80 years	28	26
> 80 years	7	6
Risk factors		
HBP	89	81,7

Diabetes	19	17,4
Stroke	13	11,9
Heart disease	4	3,7

Table 1: General characteristics of stroke cases in the intensive care unit of the CNHU-HKM (2015-2017).

Symptoms	**Size**	**Percentage (%)**
GCS		
[9 - 14]	40	37
≤ 8	64	59
Clear consciousness	5	4
Pupil		
Bilateral mydriasis	15	13,8
Anisocoria	13	11,9
Pyramidal syndrome		
Facial paralysis	23	21,10
Hemiplegia	80	73,4
Status epilepticus	24	22

Table 2: Neurological signs in cases of stroke in the intensive care unit of CNHU-HKM (2015-2017).

Complications	**Size (n=88)**	**Percentage (%)**
HICT + Brain displacement	43	48,86
Respiratory failure	52	59,10
Heart Failure	38	43,18
Severe sepsis	52	59,10
Metabolic disorders	29	32,95

Table 3: Causes of death in cases of stroke in intensive care at CNHU/HKM (2015-2017).

Associated factors	**Non-survivors (%)**	**Survivors (%)**	**p-value**
GCS			
normal	2 (40,0)	3 (60,0)	
[9-14[	28 (70)	12 (30)	0,005
≤ 8	58 (90,6)	6 (9,4)	
Complications			

No	5 (33,3)	10 (66,7)	
Yes	83 (88,3)	11 (11,7)	0,0001
Type of complication			
HICT + brain displacement			
No	45 (69,2)	20 (30,8)	0,0002
Yes	43 (97,7	1 (2,3)	
Respiratory failure			
No	36 (72,0)	14 (28,0)	0,033
Yes	52 (88,1)	7 (11,9)	
Sepsis			
No	36 (70,6)	15 (29,4)	0,011
Yes	52 (89,7)	6 (10,3)	

Table 4: Factors associated with death in strokes in intensive care unit of CNHU / HKM (2015-2017).

4. Discussion

Our research focused on 109 cases of stroke hospitalized in the intensive care unit of CNHU/HKM. The prevalence of stroke compared to admissions is low and was 5.5%. Many studies on stroke in critical care carried out in Sub-Saharan Africa have reported higher prevalence ranging between 11% and 19% [6-8]. The low prevalence rate in our work is due to the very selective inclusion criteria which include the performance of a brain scan, which was not the case in the aforementioned research. In neurology departments in Sub-Saharan Africa, stroke is the leading cause of hospitalization [9, 10].

We noted a male predominance in our stroke patients with a sex ratio of 1.22. This male predominance has been found in the works of Ngomahobet et al, Babo et al as well as Boukougou et al; these authors respectively reported the sex ratio of 1.6; 1.4 and 1.8 [6-8]. Is this tendency of men to have more strokes than women linked to the African culture in which men are much more stressed because they are forced to provide for the whole family? Other studies will help us confirm or not this finding.

The mean age was 59 ± 14 years, 28% of the patients were less than 50 years old and almost 40% between 50 and 65 years old. This trend is confirmed in most African research, with average ages varying between 50 and 60 years [11, 8, and 12]. Stroke in Africa affects young adults who make up the workforce, with serious socio-economic consequences. In developed countries of Europe and the United States, on the other hand, stroke affects older people more, with an average age around 77.5 years [13].

The most common stroke mechanism in our research was hemorrhagic stroke (59.6%). It is described that black Africans are more likely to develop hemorrhagic strokes by hypertension [14]. Worldwide, the trend is towards a predominance of ischemic stroke [15].

The overall mortality from stroke in our research was very high (80.7%), that is, more than 8 out of 10 stroke patients

hospitalized, who die in intensive care at the CNHU/HKM. In the African research on stroke, only Diouf et al in 2007 in Dakar had a mortality rate of 82.9%, which was higher than ours [16]. Agnon A. et al in 2016 at the CHU-Campus of Lomé, Mapoure Yacouba N. et al of the Hôpital Général de Douala, reported mortality rates of 72.6% and 69.2% respectively [17.18]. In developed countries where stroke is increasingly followed in neurovascular care units, much lower mortality rates have been reported, varying between 33% and 52% [19]. The reasons for this very high mortality rate in our research in particular and in Sub-Saharan Africa in general were:

- Severe initial neurological state of stroke patients admitted to intensive care;
- delay in taking care of patients, who do not come to the hospital at the first sign.
- inadequate resuscitation technical platform
- low number of skilled health personnel
- very low purchasing power of the population, most often deprived of health insurance cover.

The factors associated with death in our research were: a GCS score ≤ 8 (p=0.005), the presence of a HICT + brain displacement (p=0.0001), a respiratory complication (p=0.033) and sepsis (p=0.011). The GCS ≤ 8 has been found as a factor of poor prognosis in several studies [Adoukonou]; it indeed reflects the severity of the initial neurological lesion. Intracranial pressure (ICP) is not monitored in our intensive care unit; the diagnosis of HICT is made on little reliable clinical criteria and the non-optimal care, which further worsens the condition of our patients. As for respiratory and infectious complications, they constitute secondary cerebral aggressions of systemic origin with poor prognosis. Infectious and pulmonary complications have been identified as having a poor prognosis in the work of Sellars et al, and Westendorp et al [20, 21].

5. Conclusions

Strokes are serious neurovascular pathologies managed in intensive care when the life prognosis is engaged. Their prevalence in intensive care of CNHU/HKM was low, 5.5%. The epidemiological profile is that of an adult male (55%), 59 years on average, presenting mainly as a risk factor high blood pressure (81.6%) and whose stroke mechanism is mainly hemorrhagic (59.6%). Mortality is too high, 08 out of 10 patients will die in intensive care and the factors associated with death were a GCS ≤ 08, the presence of neurological, respiratory or sepsis complications. To reduce this high mortality rate, emphasis should be placed on taking care of risk factors, strengthening the technical platform for resuscitation, training sufficient number of health deliverers and health insurance coverage for the population.

Conflicts of Interest

None

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