Pejoratives Factors of African Young People Ischemic Stroke: Experience of Senegal

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ABSTRACT

Introduction: Strokes are frequent and severe, because of the involvement of vital and functional prognosis of patients, especially in young patients living in developing countries.

Objective: The main objective of the current study is to identify epidemiological, clinical, paraclinical and etiological predictors of adverse evolution in young adult ischemic stroke.

Methodology: Authors conducted a retrospective study at the neurological department of University hospital Fann, Dakar, Senegal, on the records of hospitalized patients from 01 January 2010 to 31 December 2011. Patients aged from 15-55 years in whom the diagnosis of ischemic stroke was selected on the basis of clinical findings and confirmed by a brain scan were included in our study.

Results: Authors gathered 116 cases. Mean patient age was 43.5 years with extremes of 19 to 55 years. The main risk factors found in the medical history of patients were hypertension (57.7%), diabetes (19%), and history of stroke (10.3%). Clinical signs were dominated by hemiplegia (95.7%) and language disorders (61.2%). The average length of stay in hospital was 16 days. A death rate of 28.4% was observed. The main predictors of adverse evolution identified were the length of stay in the hospital, age, Glasgow Coma Scale (GCS), blood glucose level. Patients with a GCS lower than 10 had a risk of death multiplied by 5. Patients with blood glucose level ≥ 2 had 4 times greater risk of death than others.

Conclusions: Glucose acute phase and state of consciousness seem to be predictors of cerebral ischemia. A quick and appropriate management will improve the vital prognosis and better recovery.

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Keywords: Ischemic stroke, Young people, pejorative factor, Mortality, Senegal.

1. Introduction:

Strokes are frequent and severe, because of the involvement of vital and functional prognosis of patients.

In sub-Saharan Africa, strokes are the third leading cause of death and motor disability in Neurology centers with 32.9% to 45% of hospitalizations in Lomé and Dakar (Balogou et al., 2004; Diouf et al., 2006). Different jobs on the population and hospital environment show that stroke occurs more often in the elderly beyond 50 years (Ashok et al., 1986). WHO notes that the number of deaths among young adults is relatively high in developing countries. More than 30% of deaths occur at this age against 20% in rich countries. This large number of deaths in poor countries is a serious public health issue because this part of the population is representing the most active part. But often leaves disabling sequelae which compromise the functional prognosis. As risk factors for occurrence were studied as those predictors of adverse evolution remain poorly understood despite some studies incriminating rheological, clinical and

meteorological factors especially among the black African subject (Longo-Mbenza et al., 2000; Wahab et al., 2008). Through this work, Authors hope to contribute to determine these factors for which an appropriate management will permit a better diagnosis and therapeutic treatment of patients. The objective of the current study is to identify the epidemiological, clinical, paraclinical and etiological predictors of adverse evolution in DALYs in young adults.

2. Methodology:

This is a retrospective study conducted at the Neurological department of University hospital Fann, Dakar, Senegal, on the records of hospitalized patients from 01 January 2010 to 31 December 2011. Inclusion criteria were being aged from 15 to 55 years in a patient with stroke diagnosis selected on the basis of clinical findings and confirmed by computed tomography (CT).

Variables that were looking for, were demographic data (age, gender), medical and surgical history (hypertension, diabetes, heart disease, history of stroke, and vascular risk factor), clinical data (general condition, neurological and other devices examination, the Barthel index for the assessment of functional disability), paraclinical (biology, brain CT scan, EEG, echocardiography, Doppler ultrasound of the neck vessels) and evolution.

Data analysis has been performed through SPSS for Windows Version 16.0. Univariate analyses were performed to calculate frequencies and averages. Then followed by bivariate analyses, Authors compared the evolution (dependent variable) and independent variables (socio - demographic characteristics, medical history, the length of stay in the hospital, the existence of severity signs related to hypertension and coma). This bivariate analysis allowed us to select the independent variables which should be put in the general model linking evolution to independent variables. Finally, through a multivariate logistic regression analysis, Authors were able to identify variables in the general model which were independently associated with patient outcome. To this end, Authors calculated the coastline ratio (odds ratio or OR) to measure risk. The results were expressed with a confidence interval of (95%).

3. Results:

Authors gathered 116 cases of patients with ischemic stroke. The mean age was 43.5 years and 80% of patients were aged between 37 and 55 years. The predominance was female with a sex ratio of 0.62 (see Table I).

The main risk factors found in the medical history of patients were hypertension (57.7%), diabetes (19%) and history of stroke (10.3%).

Clinical signs were dominated by hemiplegia (95.7%), language disorders (61.2%), followed by convulsions (24.1%) and psychomotor agitation (7.8%). Coma (18%) and hypertension (61.2%) were associated with the neurological state (Table I).

Carotid ischemia was found in 92.3% of cases and 76.8% in the area of the middle cerebral artery. Gaps sat mainly at the caudate nuclei, the basal ganglia and thalamic capsular level.

The average length of stay in hospital was 16 days. The outcome was unfavorable (death) in 33 patient. so a fatality rate of 28.4%. Sequelae (65.5%) were dominated by half body motor deficit for 72 patients (94.7%). 6% of patients had a complete recovery (see Table I).

Table I. *Patients Characteristics*

Variables	Absolute frequency	Relative frequency (%)
Age		
Average: 43.5		
Minimum: 19		
Maximum: 55		
Age in groups		
15-25	7	6
26-36	17	14
37-47	46	40
48-55	46	40
Sex		
Female	72	62
Male	44	38
Stay in hospital		
Average: 16 days		
≤ 1 week	24	20.7
[1 week, 3 weeks]	63	54.3
>3 week	29	25
Medical and Surgical Antecedents		
High blood pression	67	57.7
Diabetis mellitus	22	19
Stroke	12	10.3
Cardiopathy	8	6.8
Associated symptoms		
uncounsciens	21	18
High blood pression	71	61.2
Hyperglycemia	39	33.6
Evolution		
Death	33	28.5
Sequelae	76	65.5
Hemiplegia	72	95.7
Complete recovery		6

The results of the bivariate analysis showed that the main predictors of adverse evolution identified were the length of stay in hospital, age, sex, GCS and blood glucose level (see Table II). The death rate was very high among patients admitted to hospital for less than one week (70.8%) and more than 3 weeks (24.1%). For cons, the length of hospital stay between (1-3 weeks) was correlated with lower proportions of deaths to 14.3%. Significant differences were observed (P 0.00). Patients with a GCS scale lower than 10 had a risk of death multiplied by 5. Patients with glucose ≥ 2 had 4 times greater risk of death than others (see Table II). Authors notice that for a length of stay between one to three week was related to a low proportion of deaths (14.3%). Significant differences were observed (P 0.00). Patients with a GCS scale lower than 10 had a risk of death multiplied by 5. Patients with blood glucose level ≥ 2 had 4 times greater risk of death than others (see Table II).

Table II. *Results bivariate analysis*

Evolution / **Variables**	**Outcome (with or without Sequelae)**	**Death**
	Number (%)	
Stay in hospital*(1)		
≤1 Week	07 (29.2)	17 (70.8)
[1Week, 3Week]	54 (85.7)	09 (14.3)
>3 Week	22 (75.9)	07 (24.1)
Age (years)		
19-29	09 (69.2)	04 (30.8)
30-40	19 (70.4)	08 (29.6)
41-55	55 (72.4)	21 (27.6)
Sex		
Male	30 (68.2)	14 (31.8)
Female	53 (73.6)	19 (26.4)
GCS*(2)		
≤10	12 (44.5)	15 (55.5)
>10	68 (81)	16 (19)
Glycemia (g/l) *(3)		
[1,1-2]	17 (70.8)	07 (29.2)
≥2	05 (33.3)	10 (66.7)

* = significance difference
*(1): P=0,00
*(2): P= 0,00 OR=5,313, IC=95% ((2,087-13,522)
*(3): P=0,022 OR=4,86, IC=95%, (1,212-19,466)

4. Discussion:

The results of the current study identified predictors of adverse evolution by ischemic stroke in young patients admitted in Neurology. Thus, the risk of death was multiplied by 4 if blood glucose level is greater than or equal to 2, by 5 if Glasgow is less than or equal to 10.

High hospital mortality by stroke found in the study, reflects the severity of the disease. This high mortality has been observed in several studies. In Africa, it varies from 14.9% to 44% in Gambia (Walker et al., 2003). In the West, it ranges from 15.2% to 30% (Vemmos et al., 2000; Hankey, 2003; Hill et al., 2009).

The mean age of the current study population was 43.5 years, in agreement with Barbieux et al. (2012), who found a mean age of 43 years with a female predominance with a sex ratio of 0.61. There is, however, no relationship between the sex or age of onset of ischemic strokes and deaths of patients.

In the current study, mortality was significantly higher in hyperglycemic patients (60%) compared to those with normal glucose. Several studies have shown that mortality rates in the short and long-term and the risk of death were higher in patients suffering from a stroke who had hyperglycemia when they have been admitted to hospital (Moulin et al., 1997; Weir et al., 1997; Bruno et al., 1999). Kiers et al., (1992) found that mortality was significantly higher in patients with stress hyperglycemia, which also tend to have a bad state. The other factor (outside hyperglycemia) which has been associated with an increase in lethality was the presence of complications. However, the incidence of complications was similar in normo and hyperglycemic state; however, mortality was higher in the second group, suggesting that the presence of complications was not the only underlying factor. Regardless of hyperglycemia causes linked to a previously known or not diabetes, to abnormal glucose tolerance, hyperglycemia stress or an epiphenomenon related to the severity of the neurological deficit. Many experimental and clinical studies have implicated hyperglycemia as a predictor of poor prognosis in acute stroke (Béjot et al., 2009).

As coma, its role in stroke mortality has been the subject of several studies. Thus, results agree with those observed in developed countries such as Italy (Apetse et al., 2011), Sweden (Amarenco et al., 2008), Greece (Cambrier et al., 2003). This should encourage all practitioners to assess several times a day the level of consciousness of every patient admitted for ischemic stroke in health services and improve the methods of intensive care

The average length of stay (LOS) in the hospital was 16 days with extremes of 5 hours and 48 days. The study of Balogou et al. (2004) in Togo had already reported LOS of 23.1 days. Furthermore, Grimmonprez et al. (1997) in France was 11.1 days as LOS. The death rate was higher among patients having less than a week (70.8%) or more than 3 weeks of hospitalization (24.1%). LOS seems to play an important role in course of the disease. These results can be explained by the fact that patients with more severe brain damage, coma, and

autonomic functions damage have a poorer prognosis and often die in the first week. On the other hand, those who had a length of stay beyond three weeks have a greater risk to get complications (nosocomial infections, pressure ulcers, depression) that may worsen the prognosis.

Stroke recurrences remain frequent, 10.3% in the current study. They ranged from 4 to 30% in both developing countries and West countries (Zabsonre et al., 1997; Bruno et al., 1999; Hill et al., 2009). Although no correlation was found, its role in stroke case fatality has been noticed in other studies as in Australia (Bruno et al., 1999), Gambia (Walker, et al., 2003), and Burkina Faso (Zabsonre et al., 1997). It remains essential to ensure proper monitoring and have a good preventive strategy against recurrences.

5. Conclusion:

The prevention of stroke in young adults can be known after the screening of risk factors. Particular emphasis should be done on primary prevention through awareness campaigns in order to change behavior concerning modifiable cardiovascular risk factors. Glucose acute phase and consciousness state seem to be predictors of cerebral ischemia. An appropriate management of these predictors will improve vital prognosis and better recovery of patients.

Conflicts of Interest:

Authors declared no conflicts of interest.

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