

Stroke of Diabetic Subject: Experience of The Neurology Service of Cocody Teaching Hospital at Abidjan (Ivory Coast)

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Abstract

Introduction: Diabetes influences the clinical and evaluative profile of stroke. Age of up come type, the severances are as well the parameters which intervenes in the evolution.

Objectives: It describes the epidemiologic profile, clinical scannographic and evaluative of hospitalized patients for cerebro-vascular accident associated to diabetes.

Methodology: It was about a retrospective and descriptive study on 2 years, realized in the general service of Neurology and at Neurovascular unit of Cocody Teaching Hospital. All patients hospitalized for stroke, diabetes know or discovered during hospitalization was included. We have studied the epidemiologic data, clinic, scannographic and the evolution in the process of hospitalization. The TOAST classification was used for the etiologic classification of ischemic stroke.

Results: 79 cases of stroke associated to diabetes were diagnose on 596 patients hospitalized for stroke, the hospitalized prevalence is 13.25%. The sex ratio was from 0.79 with an average age of 64.6 years. The diabetes type II predominated with 97.5% of cases. 79.2% of patients know they were diabetic but these ones, 61.9% were unobservant to their anti-diabetic treatment. High blood pressure was associated to diabetes in 87.3% of cases. The percentage of recidivist stroke was from 27.8%. The clinical examination found a hemi corporal motor deficit in 91.6% of cases, a vigilance disorder found in 31.6% of cases and a motor aphasia in 26% of cases. Ischemic vascular cerebral accidents were predominating in 85% in cases against 21.5% of hemorrhagic stroke cases. The arteriolosclerosis was retained as etiologic of ischemic stroke in 56.5% of patients and High blood pressure in 100% of cases of Hemorrhagic stroke. We note a significant statistically correlation between the increase of HbA1C rate and the intra-hospital mortality.

Conclusion: Stroke from diabetic is frequent, severe and highly dominated by lacunar infarcts in our context.

Keywords: Stroke-diabetes; Sub Saharan Africa; Ivory Coast

Introduction

Stroke represents the first cause of handicap and the third cause of deaths throughout the world. Diabetes is one of the principal factors of risk of stroke. Diabetic patients have a risk from 1.5 to 3 times more elevated stroke and in particular cerebral infarcts, than none diabetic. This excess risk is particularly marked in young subject and in women [1].

The prevalence of diabetes in patient victims of a cerebral vascular accident is evaluated to 10-20% and each elevation from 1% of HbA1C increase the risk of fatal stroke from 37%. More to that 80% of the mortality within the diabetic population is linked to a cardiovascular disease of which stroke [2].

In the Neurology service of Cocody Teaching hospital at Abidjan, Diabetes constitutes the 5th factor of risk of stroke (18%) after high blood pressure, alcoholism, smoking and past history of stroke [3].

In sub-Saharan Africa, little data are brought back in the association between diabetes and stroke. No data is available on the subject in Ivory Coast where the initiative of this work to finally describe the epidemiologic data, clinic, scannographic and evaluative of diabetic patients victims of stroke at the neurology service of Cocody Teaching Hospital at Abidjan.

Methodology

It concerns a retrospective study and descriptive realized in two years (1st August 2013 to 31 July 2015) at the Neurology service of Cocody Teaching Hospital and at the Neurovascular Unit of the same Service. The Neurology service has a capacity of 32 beds and the Neurovascular Unit had 8 beds.

We have included all diabetic patients (Type I or II) or no before hospitalization, admitted for a confirmed stroke at the CT scan. The following parameters were studied: sociodemographic data, clinical and scannographic data.

The etiologies of ischemic stroke (according to the criteria of classification TOAST) and the etiologies of stroke. The correlation between the average stay of days on hospitalization and the up come of decubitus complications. The correlation between the glycemic control and the intrahospital mortality.

These data made object of a descriptive statistical analysis and analytic. For this last, we have used the χ^2 test with a level of significant risk of first type fixed at 5%.

Lots of patient's medical records were not in line with our inclusion criteria due to the fact that it was a retrospective work for we had wanted to treat only medical records documented by complementary examinations.

Results

Socio-demographic characteristics

During the period of study, 596 patients were hospitalized for stroke between which 79 where diabetic, a hospital prevalence of 13.25%. The average age was from 64.6 years. The patients from 51 to 80 years represented 87.4% of cases (Figure 1) the female sex predominated with a sex ratio of 0.79.

Clinical characteristics

Close to 80% of patients knew themselves to be diabetic they were all under anti-diabetic treatment but 61.9% were none observant to their antidiabetic treatment. The diabetes of type II predominated with 97.5% of cases.

High blood pressure was the principal risk factor associated to diabetes in 87.3% of cases. A recidivist of stroke was found in 27.8% of cases and between these ones 72.7% were hypertensive.

The clinical examination found a hemi corporal motor deficit in 91.1% of cases (hemiparesis in 82% of cases and hemiplegia in only 18% of cases) a vigilance disorder in 31.6% of cases, a language disorder in 45.7% constituted from a Broca-aphasia (26.6%) and of a dysarthria in 19.1%.

Tomo-densitometry and etiologic characteristics

Ischemic vascular cerebral accidents represented 78.5% of cases and the intra parenchymatous hemorrhages in 21.5% of cases. The topography of ischemic stroke interested the deeply sylvian artery territory in 40.3% of cases, of superficial sylvian artery territory in 22.6% of cases, the anterior cerebral artery in 9.7% of cases, the posterior cerebral artery in 1.6% of cases and the multiple infarcts in 24.2% of cases. The topography of parenchymatous hemorrhages concerned the basal ganglia in 58.8% and the posterior fossa (cerebellum and brain stem) in close to 12%. In 29.4% of cases, it is all about deep hemorrhage (basal ganglia) with ventricular flow and mass effect.

The infarcts of large size (diameter of infarcts > 15 mm) was observed in 43.5% of cases.

Arteriolosclerosis was the most frequent etiologies of ischemic stroke according to the TOAST classification (Figure 2 and Table 1). The Small arteries diseases linked to high blood pressure were retained as etiology of hemorrhagic vascular cerebral accidents of the totality of cases.

Evaluative data

We have noted a significative correlation between the elevation of the HbA1C and the intra hospital mortality ($p < 0.02$). For a rate of HbA1C situated between 9 and 10%, the percentage of mortality was from 35.7% whereas for a superior rate at 15%, the mortality was increasing at 55% (Figure 3). The global rate of mortality was 26.6%.

The average stay of day while on hospitalization was correlated to the up come of decubitus complication (independently from the rate of the HbA1C with a difference statistically significant ($p < 0.005$). The global rate of decubitus complication was from 41.7%.

Discussion

Type II Diabetes is a current pathology, which touches 3% to 5% of persons living in abroad countries and constitutes a risk factor well known from cerebral infarcts [4,5].

In Africa, diabetes touches about 14 million in habitants (Averagely 4.8%). In 2030 about 23.9 million inhabitants will suffer from diabetes in sub-Saharan Africa [6]. The prevalence of this pathology is from 5.7% in Ivory Coast [7].

Stroke and cardiovascular diseases represent almost 70% of mortality causes in diabetic patients [8,9].

Our prevalence from 13.25% concords with certain data describes in the literature, which situated it in an interval from 9.5% to 20% [10,11]. Whereas it is equally inferior to other studies which note prevalence from 16% to 24% [12]. This can be explained by the diversity of methodologies but also by the hospital character of our work.

According to the literature, our sample had a female predominance. In effect diabetic of feminine sex is exposed to a multiple stroke risk by 3 to 6.5 as compared to no diabetic [13-15]. The High blood pressure was associated to diabetes in $\frac{3}{4}$ of our patients. This association exposes patients to an acute risk of an up come of stroke. The UK prospective Diabetes Study (UKPDS) realized in hypertensive diabetic shows that a reduction in average of 10 mm hg of systolic artery pressure considerably reduces the risk of 44% of stroke.

Stroke of a diabetic is dominated by a less incidence of intra parenchymatous hemorrhages. Lobar hematoma was not identified in this work, that which was found in other studies. Hemorrhagic stroke are six times less frequent in diabetic patients than in none diabetic patients [16].

In our work ischemic stroke represent close to 4/5 of ours sample and amongst these ones the lacunar infarcts represented 46.5%. Within this while many studies have described an association between diabetes and the up come of lacunar infarcts [17-20]. Is it because majority of our patients are hypertensive? These lacunar infarcts are in effect the direct consequences of chronic complications of high blood pressure on cerebral perforates artery by lipohyalinosis and arteriolosclerosis. Diabetes is also well known as etiology of illnesses of small arteries and will mostly be probably a risk factor for lacunar infarcts [20,21]. These studies bring that Tobacco, embolic

cardiopathies and hyperhomocysteinemia are also lead to lacunar infarcts.

This work permitted us to do a correlation statistically significative between the elevation of the HbA1C and the incidence of the intra hospital mortality.

The mortality was 100% in the patients group having a rate of Hb1AC between 13 and 14.9 while it was at 55% in the group having a rate superior to 15%. This mortability variation can be simple explained by the numbers of patients included in the first group which was of one patient (dead patient) whereas in the second group it was a patient of which five dead.

This correlation was equally shown in the UKPDS Study, who notes which elevations of HbA1C from 1% were associated to a majority of the lethality by stroke from 37% [22]. In effect there exist a strong link between the carbohydrate metabolism disorder and the cardiovascular mortality of which stroke [1]. This acute phase especially in patients unstable in the glycemic status (with glycemic numbers).

These poor mechanisms are a less good recanalization of occluded artery via a pro-coagulation action and a reduction of a fibrinolysis, a reduction of the reperfusion of ischemic tissue and a more large height of the necrosis. This hyperglycemia will give an accent of lesions linked to the reperfusion, explaining the largest frequencies of hemorrhagic transformation during fibrinolysis treatment [22,23].

The more the duration of stay is prolonged, the more patients are exposed to do decubitus complications and this could be explained by prolonged bed lying of patients, insufficiency of health personnel in order to do nursing well (one nurse for 32 beds. This is why the parents of the patients are educated to do nursing and to give food to patients) but also nosocomial infections.

Conclusion

Diabetes is a major risk factor of stroke. Associated to the high blood pressure it exposes to an acute incidence of cardiovascular diseases of which stroke. Stroke of diabetic is frequent and serious dominated by ischemic stroke. It is equally a gravity factor of stroke in terms of mortality, the sequel and prolonged stays of intra hospitalized days.

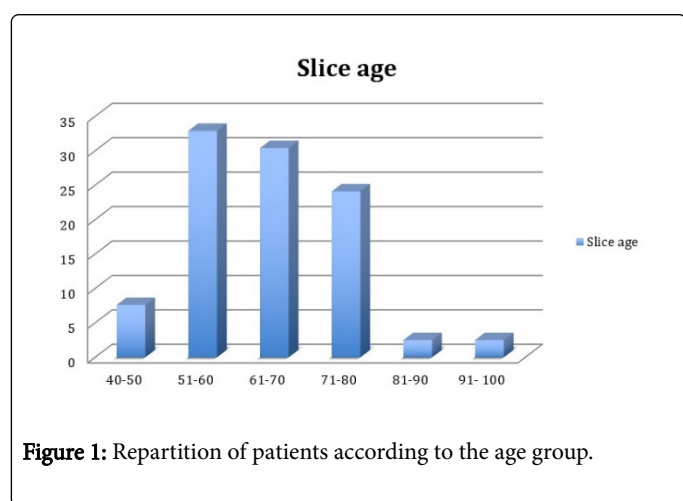


Figure 1: Repartition of patients according to the age group.

TOAST	Frequencies	Percentage
Atherosclerosis	23	37.1%
Arteriolosclerosis	35	56.5%
Embolic cardiopathy	4	6.4%
Other origin	0	0.0%
Unknown origin	0	0.0%
Total	62	100%

Table 1: Ischemic stroke etiology according to the TOAST classification.

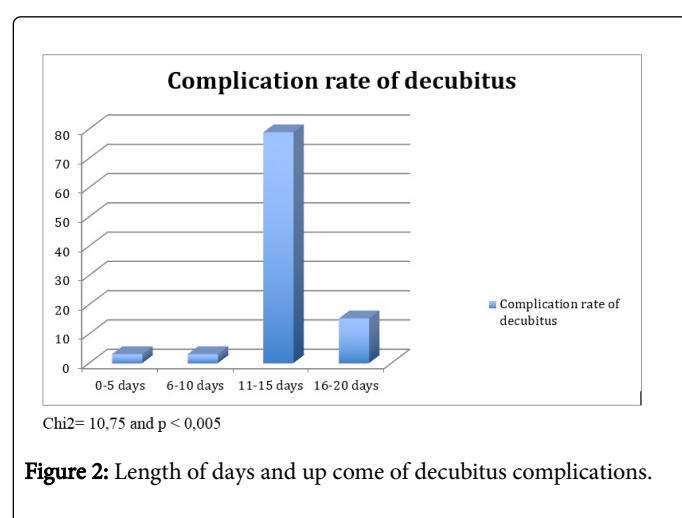


Figure 2: Length of days and up come of decubitus complications.

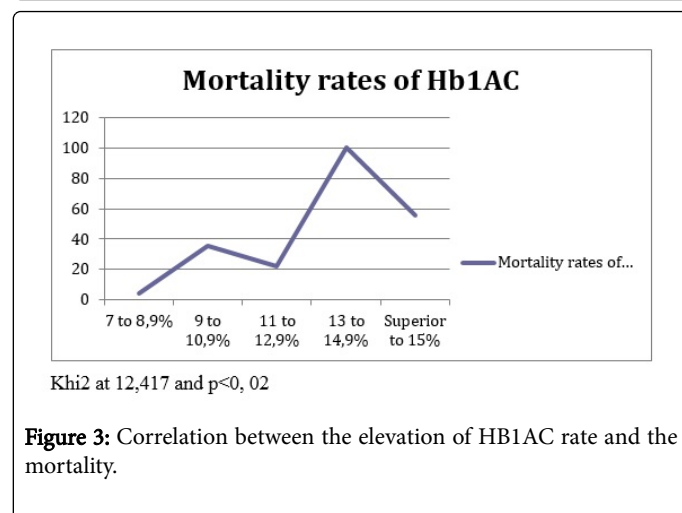


Figure 3: Correlation between the elevation of Hb1AC rate and the mortality.

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