

Cerebral Vascular Accidents Occurring During Type 2 Diabetes in the CHU-PG Internal Medicine Department

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Abstract

Introduction: Diabetes is a major cause of death and disability worldwide. It also represents a significant risk factor for stroke. The excess stroke risk associated with diabetes is significantly higher in women than in men, independent of sex differences observed for other major cardiovascular risk factors. **Materials and Method:** This retrospective descriptive study was carried out in the Internal Medicine department of Point G University Hospital from January 2008 to December 2012. Included in this work were all type 2 diabetic patients hospitalized in the department during the duration of the study, presenting clinical signs of sentivo-motor deficit with performance of a brain CT scan. **Results:** At the end of this work, 358 patients were hospitalized, among whom 19 cases of established stroke were recorded, i.e. a frequency of 5.3%. Dilated cardiomyopathy represented 36.8% of cases. LVH and repolarization disorders accounted for 21.1% each. Composite ischemic stroke represented 79% of cases followed by mixed stroke or 16% of cases. The evolution was marked by after-effects such as left hemiparesis 36.8%, right hemiplegia 10.5% and death in 5.3% of cases. Dyslipidemia 82%, hypertension 84.21% were the risk factors most associated with diabetes. **Conclusion:** Strokes are common in type 2 diabetic patients. Their prevention requires better management of diabetes and its associated risk factors.

Keywords: Established cerebrovascular accidents, Type 2 diabetes, University hospital.

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INTRODUCTION

Diabetes is a group of metabolic diseases characterized by chronic hyperglycemia resulting from a secretion defect and/or its action [1].

It also represents a significant risk factor for stroke. The excess stroke risk associated with diabetes is significantly higher in women than in men, independent of sex differences observed for other major cardiovascular risk factors [2].

Type 2 diabetes is becoming a global pandemic. In 2003, an estimated 183 million people worldwide had diabetes. We will go from 300 million people affected in 2010 to more than 552 million in 2030 [3].

Mali is one of the poorest countries in the world and already has more than 3% of people with diabetes among its population. Diabetes is a major cause of death, the leading cause of blindness, dialysis and represents 60% of non-traumatic amputations [4].

Cerebrovascular accident (CVA or stroke in English) is a focal neurological deficit of sudden onset (onset in less than 2 minutes) linked to damage to the brain parenchyma by infarction or hemorrhage [5].

In the UK-GPRD cohort including nearly 245,000 individuals, stroke rates were 11.9 per 1,000 person-years in the diabetic group (5.8% of the cohort), compared to 5.5 in the diabetic group (5.8% of the cohort) the group of healthy subjects [6].

METHODOLOGY

This was a retrospective descriptive study conducted from January 2008 to December 2012 in the Internal Medicine department of the Point G University Hospital Center (CHU).

This study concerned all type 2 diabetic patients hospitalized with a stroke. All type 2 diabetic patients were included, regardless of age and sex, hospitalized in the Internal Medicine department, presenting clinical signs of sensory-motor deficit who were able to perform a brain CT scan, i.e. 19 patients out of 358 files examined.

For all patients, we collected sociodemographic variables (age, sex, ethnicity, profession, residence), clinical variables (general condition, blood pressure, weight and height with the calculation of BMI), aspects of the skin, neurological examination assessing higher functions, sensitivity, motor skills, tone, reflexes and coordination) and paraclinical:

Biological: fasting blood sugar, glycated hemoglobin (HbA1c), Triglycerides, LDL-c, HDLc, uricemia, micro albuminuria).

Morphological: brain scan, ECG, heart echo, and Doppler ultrasound for ASD. These data were collected on an individual survey form. Data entry and analysis were carried out using Word 2007 and Epi info 3.5.3 software.

RESULTS

1. Overall results:

- From January 2008 to December 2012, we were able to include 19 patients out of 358 files, representing a prevalence of strokes in type 2 diabetics of 5.3%.

2. Sociodemographic data:

- The average age of our patients was 56.15 years \pm 12.52 with extremes of 35 and 84 years.
- The female gender represented 63.2% including 63.0% housewives.

3. Clinical data:

- The progressive nature of the motor deficit was more represented, i.e. 78.9% of cases.

- The association of hypertension + diabetes represented 68.4% of cases in our patients.
- The majority of patients had a normal BMI, i.e. 63.2%, followed by overweight patients 26.3%. Polyuro-polydipsia syndrome (PPS) was the most common mode of discovery of diabetes with 68.4% of cases. The majority of patients had an HbA1C > 7% or 68.0% of cases. Hypertension and dyslipidemia were the most represented risk factors, respectively 84.21% and 82% of cases. Early diabetic nephropathy represented 42.0% of cases. Dilated cardiomyopathy represented 36.8% of cases.
- Left hemiparesis represented 21.0% followed by right hemiplegia or 16.0% of cases.
- Composite ischemic stroke represented 79% of cases followed by mixed stroke or 16% of cases.

4. Evolution of the disease:

- The evolution was marked by death in 5.3% of cases.
- Total recovery of the motor deficit was observed in 26.3% of patients;
- Left hemiparesis represented 36.8% of cases.

DISCUSSION

Our study suffered from some shortcomings:

The unfavorable economic conditions in certain patients did not allow certain assessments to be carried out such as brain CT, ECG, lipid assessments, as not everyone is affiliated to compulsory health insurance in Mali.

The insufficient sample, all these contributed to underestimating the prevalence of strokes in diabetic patients hospitalized in the department.

On the other hand, the present study has the advantage of being descriptive exclusively on the association of stroke and type 2 diabetes for the first time in Mali at the date of the study.

In general, diabetic patients have a 1.5- to 3-fold increased risk of stroke compared to healthy subjects [7, 8].

In our series, the prevalence of established stroke was 5.3% in agreement with the UK-GPRD study 5.7% [6] and Pichard *et al.*, 5.2% [9]. This frequency is slightly higher than that found in Lokrou 4.09% [10]. On the other hand, it is significantly lower than that found by Monabeka 21.7% [11], and that of Tchombou 12.3% [12]. This difference could be explained by the small size of our sample.

In our study women represented 63.2% in agreement with TANGARA which found 64.9% [13], this high prevalence among women was also confirmed

by a meta-analysis appearing in the Lancet whose maximum combined RR of diabetes-associated stroke was 2•28 (95% CI: 1•93—2•69) in women and 1•83 (1•60—2•08) in men [1].

This high number could be explained by the greater use of health structures by women.

The average age in our study was 56.15 ± 12.52 years in agreement with Diallo AD. with 55.7 years [14]. Most of the patients were housewives, i.e. 63% of cases. Two thirds of the patients were poorly balanced, i.e. 68.0% of cases.

This rate of poorly balanced patients is explained by the difficulty in complying with the diet among our patients and the lower adherence to continuous treatment.

In our study, PPS represented 68.4% of cases compared to 45.97% found in COULIBALY [15].

In our series, the frequency of obesity was 10.5% of cases, compared to 16.4% found in TANGARA [13] and 42.5% in Sankalé [16]. This difference could be explained by the size of our sample.

Among the medical history, the association of hypertension and diabetes represented 68.4% of cases, compared to 16.7% by Pichard *et al.*, [9] and 39.9% found by COULIBALY [15], 43% for Hassine [17].

10.5% of our patients were smokers compared to 25.5% at Diallo AD. [14], 30.3% at COULIBALY [15]. The size of our sample could explain this difference. Dyslipidemia represented 82% in agreement with COULIBALY 82.5% [15].

In our study, hypoglycemia represented 10.53% of cases, which is significantly higher than that found by COULIBALY 3.3% [15]. This difference could be explained by the eating disorders caused by the stroke.

Cardiomyopathy in our study concerned 13 patients or 68.4% of cases, higher than that found by TANGARA 20.2% of cases [13].

Among ECG abnormalities, LVH represented 21.1% of cases compared to 39.4% of cases in TANGARA [13].

Constituting ischemic stroke represented 79% of cases in agreement with TANGARA 81.8% of cases [13] this high prevalence is also confirmed by a meta-analysis of 64 cohort studies [1].

The evolution was marked by death in 5.3% of cases, this rate is slightly lower than that found by TANGARA 7.2% of cases [13].

CONCLUSION

Strokes are common in type 2 diabetic patients. Their prevention requires better management of diabetes and its associated risk factors.

REFERENCES

1. Senet, P., & Chosidow, O. (2002). Manifestations cutanéomuqueuses du diabète. *Encycl Med chir*, 10-366.
2. Peters, S. E., Huxley, R. R., & Woodward, M. (2014). Diabetes as a risk factor for stroke in women compared with men: a systematic review and meta-analysis of 64 cohorts, including 775 385 individuals and 12 539 strokes. www.thelancet.com. Published online March 2014, 8p.
3. International Diabetes Federation (IDF). IDF Diabetes Atlas, 5th edition, 2011, <http://www.idf.org/diabetesatlas/5e/the-global-burden>.
4. ONG Santé Diabète (SD). Rapport annuel des activités menées. Du 01 janvier au 31 Décembre 2011. WWW. Santediabete.Org.
5. AVC. Collège des enseignants de Médecine vasculaire et Chirurgie vasculaire, UMVF, 2011. 59p.
6. Mulnier, H. E., Seaman, H. E., Raleigh, V. S., Soedamah-Muthu, S. S., Colhoun, H. M., Lawrenson, R. A., & De Vries, C. S. (2006). Risk of stroke in people with type 2 diabetes in the UK: a study using the General Practice Research Database. *Diabetologia*, 49, 2859-2865.
7. Almdal, T., Scharling, H., Jensen, J. S., & Vestergaard, H. (2004). The independent effect of type 2 diabetes mellitus on ischemic heart disease, stroke, and death: a population-based study of 13 000 men and women with 20 years of follow-up. *Archives of internal medicine*, 164(13), 1422-1426.
8. Stegmayr, B., & Asplund, K. (1995). Diabetes as a risk factor for stroke. A population perspective. *Diabetologia*, 38, 1061-1068.
9. Pichard, E., Toure, F., Traore, H. A., & Diallo, A. N. (1987). Les complications dégénératives du diabète sucré au Mali. *Med Afr Noire*, 34, 403-411.
10. Lokrou, A. (1992). Diabète sucré: Acquisitions et perspectives. *Sem Hôp Paris*, 68, 662-672.
11. Monabeka, H. G., Bouenizabila, E., Mupangu, M., Kibangu, N., & Etitiele, F. (1998). Hypertension artérielle et diabète sucré à propos de 152 diabétiques hypertendus. *Médecine d'Afrique Noire*, 45(2), 106-109.
12. Almdal, T., Scharling, H., Jensen, J., & Vestergaard, H. (2004). The independent effect of type 2 diabetes mellitus on ischemic heart disease, stroke, and death: a population-based study of 13,000 men and women with 20 years of follow-up. *Arch Intern Med*, 164, 1422-1426.
13. Tangara, M. (2006). Complications cardiovasculaires au cours du diabète dans le service

- de cardiologie de l'hôpital Gabriel TOURE. Thèse, Med, Bamako, N 06 m 183.
14. Diallo, A. D. (2006). Evènements cardiovasculaires chez les hypertendus diabétiques et non diabétiques au CHU point G. These, Med, Bamako, 109.
 15. Coulibaly, I. (2010). Etude des facteurs de risque cardiovasculaires chez les patients diabétiques à Bamako. These, Med, Bamako; N 10 m 208.
 16. Sankalé, M., Diop, B., & Bao, O. (1977). Conduite pratique du traitement de la gangrène diabétique en Afrique noire à propos de 50 cas personnels inédits. *Bull Soc Med Afr Noire*, 22, 248-257.
 17. Hassine, M. (2009). Diabete and metabolism. 35(Suppl 1), 43. <http://www.sciencedirect.com/science/article/pii/S1262363609718609>