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Medicine

Epidemiological, Clinical and Therapeutic Aspects of Diabetes Mellitus in the Elderly in the Internal Medicine Department of the University Hospital Center Point G

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Abstract **Original Research Article**

***Introduction*:** Diabetes mellitus in the elderly is a complex chronic disease and represents a real public health problem. The diabetic elderly person is particularly fragile since they combine the effects of aging and disease**.** ***Methodology*:** This was a descriptive, cross-sectional and analytical study with retrospective data collection extending from January 2007 to December 2021 carried out in the Internal Medicine department of CHU Point G in Bamako (Mali). Data were collected from medical records and entered and analyzed with SPSS 16.0 version 22 software. ***Results*:** We report a hospital frequency of 8.94% with an average age of 72.75 ± 7.16 years. A female predominance was observed. The foot wound was the main reason for hospitalization. The most frequent nosological type of diabetes was type 2. The mode of discovery of diabetes mellitus was mainly fortuitous. The mean HbA1c was 10.44±2.79%. Hyperosmolar hyperglycemia syndrome was the most found acute complication while PAD and diabetic neuropathy were the predominant chronic complications. High blood pressure has been frequently associated with diabetes. The treatment of diabetes was mainly based on insulin antidiabetics. ***Conclusion*:** The elderly diabetic must be studied as a whole in order to prescribe an appropriate treatment taking into account comorbidities, prevent certain complications and avoid polymedication as much as possible.

Keywords: Diabetes mellitus, elderly person, internal medicine, CHU Point G, Bamako.

INTRODUCTION

Diabetes mellitus in the elderly is a heterogeneous group of diseases which results in chronic hyperglycemia associated with disorders of the metabolism of carbohydrates, lipids and proteins; responsible in the long term for severe disabling micro and macrovascular complications occurring in a subject aged 65 and over [1]. Older people with diabetes represent a large and growing fraction of older people [1]. In 2021, according to the International Diabetes Federation, the estimated number of people living with diabetes is 537 million. If this trend continues, the number of people over the age of 65 (65 to 99 years) living with diabetes will be 195.2 million in 2030 and 276.2 million in 2045 [1]. The elderly diabetic subject is particularly fragile since he combines the effects of aging (frequent geriatric syndromes) and illness (micro and macroangiopathic complications); thus increasing the risk of early mortality, functional disorders and comorbidities. The management of such patients is complicated due to clinical polymorphism, explaining the high morbidity and mortality in this group [3]. Few studies have been carried out in our context, hence the aim of our study.

METHODOLOGY

Our study was carried out in the Internal Medicine department of the University Hospital Center - Point G. It was a descriptive, cross-sectional and analytical survey with retrospective data collection extending from January 1, 2007 to December 31, 2021, i.e. a period of 15 years old. All patients aged at least 65 years hospitalized for diabetes mellitus in the internal medicine department at Point G University Hospital were included in the study. The sample size calculated according to the Schwartz formula was 130 elderly patients. Data were collected from patients' medical files and recorded on a pre-established individual survey by taking into account the objectives of the study. We collected sociodemographic variables, clinical and paraclinical data; acute and chronic complications; therapeutic and evolutionary data. The data were processed and analyzed on the computer using SPSS 16.0 version 22 and Epi 604fr software for Windows. Pearson's chi-square statistical test, or Yates' correction, or Fisher's exact test for categorical variables and Student's test for quantitative or continuous variables were used for comparisons with $p < 0.05$ set as the significance threshold.

RESULTS

During the study period, 6590 hospitalized patients including 1175 elderly people including 105 diabetic elderly people were recruited in our study, i.e. a frequency of 8.94% of diabetics in the elderly within the Internal Medicine department of the University Hospital Center Point G.

➢ Sociodemographic characteristics

The average age of the patients was 72.75±7.16 years with extremes of 65 and 95 years; the 65-69 age group represented 39% of cases (figure 1). The female gender represented 51% of cases, i.e. a sex ratio of 0.94. Seventy-three percent of elderly people with diabetes were socio-economically dependent. Patients coming from urban areas represented 89% of cases.

➢ Clinicals and paraclinicals data

The main reason for consultation was diabetic foot, i.e. 46.7% of cases. High blood pressure represented 59% of cardiovascular risk factors. The average duration of diabetes progression was 9±5.3 years (Table 3). The average BMI was 22.66±5.11 kg/m2. Type 2 diabetes was represented in 97% of cases. The incidental discovery (80.5%) was the main circumstance for discovery of diabetes mellitus. Undernutrition was found in 28% of cases. Forty-four percent of elderly diabetic patients presented with hand-foot infection followed by urogenital infection at 38% and pulmonary infections in 28% of cases. The average HbA1c was 10.44±2.79% with a minimum of 6.5% and a maximum of 18.5% (Table 2). Dyslipidemia was found in 44% of patients. Eighteen diabetic patients, or 17.14%, had carried out a cytobacteriological examination of the wound.

➢ Acute and chronic complications

Hyperosmolar hyperglycemic syndrome represented the main acute metabolic complication (27.62%). Fundus examination was performed in 43 patients or 40.95%. Diabetic retinopathy was found in ten patients or 9.52%; diabetic neuropathy was present in 49 patients or 47%; diabetic nephropathy was present in 25% of cases. Macroangiopathies were absent in 32 patients or 30.48% (Table 1). Infectious complications were dominated by hand and foot infections in 44% of cases, followed by urogenital infections and

➢ Therapeutics and evolution

The overall treatment was hygienic-dietary measures associated with non-insulin antidiabetics, i.e. 35.24%, insulin was used in 91% of elderly patients. Rapid insulin was used in 71.87% of cases. The 3 injections/day regimen was the main regimen used (Table 4). Thirty-six diabetic patients (64%) were on biguanides (metformin). Statins were the main normolipemanant used (84.78%).

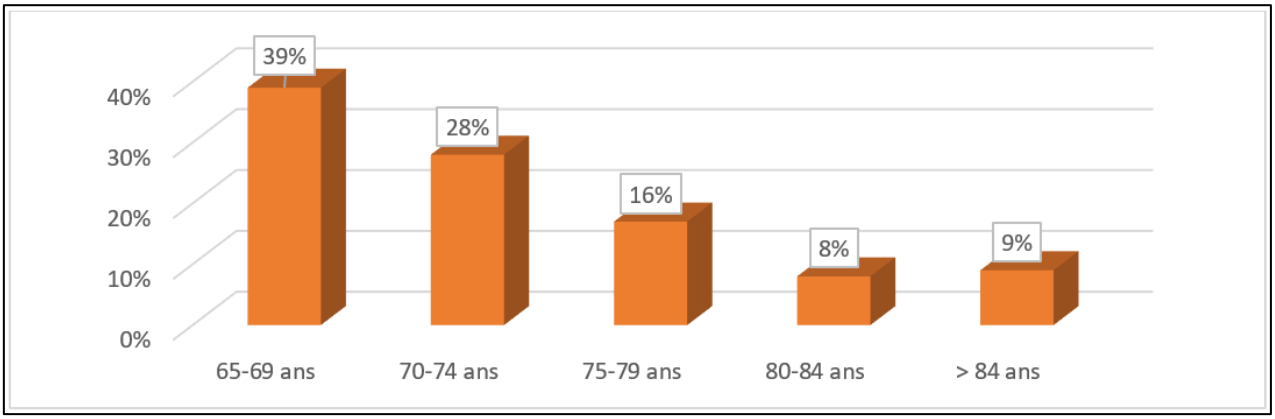

Figure 1: Distribution of patients according to age group

Table 1: Distribution according to chronic complications of diabetes mellitus

Chronic complications	Effective	Percentage (%)
Macroangiopathies (n=73)		
Obliterating arteriopathies of the lower limbs	29	28,00
Stroke	16	15,00
Coronary insufficiency	28	26,00
Microangiopathies (n=85)		
Rétinopathy	10	9,52
Neuropathy (peripheral et autonomic)	49	47,00
Néphropathy	26	25,00
Others complications (n= 86)		
Podiatry	49	46,73
Infectious	37	35,24

Table 2: Distribution according to glycemic balance by HbA1c

HbA1c result	Effective	Percentage (%)
≤ 7%	29	27,62
8 – 10	**41**	**39,05**
>10	35	33,33
Total	105	100,00

Table 3: Distribution of patients according to the duration of progression of diabetes mellitus

Duration (in years)	Effective	Percentage (%)
≤10	**60**	**57**
>10	**45**	**43**
Total	**105**	**100**

Table 4: Distribution according to insulin regimen

Insulin regimen	Effective (n=96)	Percentage (%)
1 injection/day	1	1,04
2 injections/day	27	28,12
3 injections/day	66	68,75
4injections/day	2	2,08

Table 5: Relationship between chronic complications and HbA1c

	Glycemic balance HbA1c (%)			
Macroangiopathie	≤ 7	8- 10	> 10	**Total**
Present	**20**	**24**	**29**	73
Absent	**7**	**13**	**12**	32
Total	27	37	41	105
Khi-2 =2,08			p = 0,01	
Microangiopathie	≤ 7	8- 10	> 10	**Total**
Present	**9**	**4**	**7**	20
Absent	**18**	**33**	**34**	85
Total	27	37	41	105

Khi-2= 4,40 p = 0,025

DISCUSSION

The aim of our study was to study the epidemiological, clinical and therapeutic aspects of diabetes in the elderly in the Internal Medicine department of University Hospital Center Point G. During our study period, we recorded 105 diabetic elderly people out of a total of 6590 hospitalized patients, including 1175 elderly people, representing a hospital frequency of 8.94%. This result is lower than those of Traoré [3]; Charles [4] and Chami [5]. This difference could be explained by the sample size of each study.

The average age in our study was 72.75±7.16 years. This result is close to that of the SMA study [6] in Niger which found 70.1 years; Doucet [7] and Chami [5] but superior to those of Abodo [11]. The sex ratio was 0.94, comparable to the results of Traoré [3], Doucet [7], Chami [5] and Lokrou [2]. According to the IDF 2019 [3], there is a global male predominance among diabetics aged 60 - 69, from 70 and over there is a reversal of this trend. In Mali, according to a report from the national statistics institute [10], the percentage of women is

relatively higher than that of men, which could explain this result.

The main reason for hospitalization in our study was foot injury, this result is consistent with most studies. Diabetes and its complications were the main reason for hospitalization in Charles' study [4]. Elderly diabetic patients mainly had type 2 diabetes, however we found 3% secondary diabetes (steroid-induced diabetes secondary to pancreatitis). This result is close to that of Traoré [11]. Elderly diabetic patients were smokers in 22% of cases; superimposable with those of Traoré [12] and Bauduceau [13]. Hypertension was the main comorbidity found; this result is consistent with that of other studies and the literature. Elderly diabetic patients were sedentary in 13% of cases in our study; this result differs from those of Sani [13], Abodo [14] and Chami [5]. Elderly diabetic patients were sedentary in 13% of cases in our study; this result differs from those of Sani [13], Abodo [14] and Chami [5]; This association increases the risk of developing thromboembolic complications.

The incidental discovery was the main circumstance of discovery of diabetes mellitus in our study followed by the cardinal syndrome, these results are different from those of Ikram [7] and de Traoré [11]. The average HbA1c was 10.44%±2.79. It is superior to studies by Abodo *et al.,* [10], Ikram [7] 8.9 ± 2.1% and Traoré [3]. This high average among our patients can be explained by the poor therapeutic education of elderly people who are very often left to their own devices and also by the therapeutic inertia of practitioners. Dyslipidemia was found in 3% of cases in our study.

Acute metabolic complications of diabetes mellitus were dominated in our study by hyperosmolar hyperglycemic syndrome, followed by diabetic ketoacidosis and hypoglycemia. These results differ from those of Ikram [7]; by Marchanson [15] and the SMA study [6]; but they are superimposable to those of Traoré [3]. Hypoglycemia in the elderly is most often of iatrogenic origin and is the most feared [16].

Diabetic retinopathy was found in 9.52% of cases. It is close to that of Traoré [3], different from the results of Abodo [11], Charles [4], SMA [6] and Ikram [7]. This difference could be explained by the fact that most of our elderly diabetic patients did not have a fundus examination performed. Diabetic neuropathy was present in 47% of our patients. This result is superimposable to that of Ikram [7] and differs from that of Traoré [3] and the study of SMA [6] but it is superimposable to the results of Sidibé in Mali [18] and Chami [5]. Diabetic neuropathy still remains the main microangiopathy found in numerous studies [17]. Diabetic nephropathy was found in 25% of our patients, this result overlaps with those of Traoré [6]; Doucet [10]; Sidibé [15] and differs from those of Charles [15] and Ikram [7]. This difference could be explained by undervaluation. We found a significant relationship (p = 0.01) between the duration of progression of diabetes and the occurrence of microangiopathies.

The most common macroangiopathy found in our study was obliterating arteriopathy of the lower limbs (PAD) followed by coronary insufficiency. This result is comparable to most studies. We found statistically significant relationships (p = 0.025) between the duration of progression of diabetes and the occurrence of macroangiopathy and between glycemic balance and the occurrence of macroangiopathy (p = 0.01). We encountered difficulties in making the early diagnosis of PAD in the majority of elderly diabetic patients in our study. All cases of PAD identified were patients with foot wounds with a vascular or neurovascular component.

The majority of elderly patients were on insulin, with rapid insulins as the mainstay. This result agrees with those of Abodo [11] and Chami [5]. And differs from those of Traoré [12] and Abodo [14]. The use of insulin could be explained by the fact that the subjects are older and therefore the presence of several comorbidities, certain contraindications to ADNI and the occurrence of insulin recurrence; may justify starting insulin therapy.

Limitations of our Study

The sample size could not be reached, it was estimated at 130 patients and our survey included only 105 elderly diabetic subjects. The defective state of several medical files due to poor archiving and poorly completed files that were often unusable were responsible for the small size of our sample. The method of retrospective collection of part of the study data explains why some files consulted are incomplete. These limits contribute to reducing the size of the sample according to the parameters measured without any real impact on the quality of the results given the large number of files processed. Despite these limitations, this study gives us an overview of the epidemiological and therapeutic aspects of diabetes in the elderly in the Internal Medicine department of the University Hospital Center Point G.

Our study included 105 elderly diabetic patients. We noted two cases of secondary diabetes. The most frequently associated comorbidity was hypertension. Acute metabolic complications were dominated by hyperosmolarity, while chronic degenerative complications were diabetic neuropathies. The foot wound was the main reason for hospitalization. The treatment of diabetes mainly concerned insulin.

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Conflicts of Interest: The authors declare no conflicts of interest.

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