Original Research Article

Epidemiological aspects of Diabetes and complications at mark Sankale in Abass Ndao Hospital in Dakar (Senegal) from January 2011 to May 2013

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A B S T R A C T

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In Senegal, diabetes now appears as a real public health problem. However, there is no reliable data on the prevalence and extent of the disease that is gaining ground among the general population. The frequency of 11.25% that we found in our study confirms the minimum of 10% estimated by the government. However, the disease is more prevalent in the age group 50 years and over who concentrates 53.33% of diabetics, and women are more affected than men. Of the 135 diabetics identified during our work, 78 had complications, or 57.77% of diabetics, and these results are alarming and among the complications observed included: AVC (3.8%), myocardial infarction (6.4%), renal failure (3.8%), abortion (28.20%), dental infections detected (10.26%), diabetic foot (20.51%), neuropathy (11.54%) retinopathy (5.13%) and sexual weakness (10.26%). Apart from these complications, bacterial infections were also in 51 diabetics, or 37.77% germs are met: *Klebsiella pneumoniae* (in 9%), *Candida albicans* (at 4.4%), Escherichia coli (in 11 , 85%), *Proteus vulgaris* (at 2.96%), *Serratia sp.* (at 3.70%), *Staphylococcus* (at 1.48%), *Proteus mirabilis* (at 2.96%). Risk factors associated with different complications were noted: moderate physical activity (sedentary) in 57.70% of diabetic diet abnormal in 73%, HbA1c>7% from 75.64%, hypertension in 62.82%. Other factors were reported as alcohol, duration of disease, smoking and socio-economic factors.

Introduction

In Greek, "DIABETES" means "that which passes through." According to WHO, diabetes is a state of chronic hyperglycemia in an individual. The type II diabetes, formerly called "non-insulin dependent diabetes" (NIDDM), accounts for about 90% of cases (1). It usually appears after age 50, as shown by studies: in Cotonou with 77.45% of patients between 50 and 60 years, that is to say, part of the workforce devoted

to the production and Congo with 53.65% of the patients are between 40 and 60 years (2). The type I diabetes, diabetes once said "insulin" (DID), affects approximately 10% of patients (10). Compared to the prevalence of the disease, the data provided by the WHO in 1994 and 2000 were respectively 110 and state 150 million diabetics worldwide. In 2013, there were 400 million and by 2025 it is expected to more than 500 million. According to projections by the WHO and the International Diabetes Federation, the prevalence of diabetes in the world's population will rise from 8.3% today to 9.9% in 2030 (4,6). In the case of Senegal, the prevalence varies among localities and are sources is estimated at 2% by WHO, but other studies indicate 6% and 10% (9,13). In diabetes center Marc Sankale Dakar for example, only center specializing in the treatment of diabetes, the number of cases increased from 200 in 1980 to more than 20,000 patient records in 2010. Diabetes can lead to the occurrence of numerous complications, including cardiovascular complications that can lead to coma, chronic skin complications, dermatitis, kidney failure and complications of arteriosclerosis which are associated with risk factors (8, 6,11,12).

Indeed, studies in an urban population of Dakar in 2012 showed that sex, age, high blood pressure (hypertension), socio-professional categories and the body mass index (BMI) were associated with diabetes (5,7). In this study, subjects who had complications were mainly those who had a high BMI and those with hypertension. In Mali, the prevalence of hypertension was more common in patients with type 2 diabetes with a prevalence of 29%, it is the same in Ivory Coast and Nigeria, where it is 31% (4, 3). Studies by WESDR and UKPDS on Indian subjects showed an increase in HbA1c of 1% is accompanied by an increase

in 10 years 10% of cardiovascular mortality and the occurrence of many infections bacterial when HbA1c is greater than 7% (13). In addition, other risk factors for AVC were observed in diabetics, such as tobacco, alcohol and duration of the disease (14). In journal, Canadian Herat Health Survey, the prevalence of obesity, hypertension, sedentary lifestyle and high cholesterol were higher in the diabetic group (14).

Study Population

Our study of 135 diabetic listed from 1200 patients came to be viewed on the laboratories of Medical Biologics analysis Center at Abass NDAO hospial's DAKAR (Senegal), a frequency of 11.25%. Of the 135 diabetic patients were 40 men and 95 women and they are aged 12 to 87.

Materials and Methods

Our study was conducted from January 2011 to May 2013 at the Abass NDAO hospital in Dakar (Senegal). First, blood glucose was determined for all patients came to be viewed using a spectrophotometer type 330 BTS. Have been recognized as the diabetic subjects with fasting glucose greater than 1.10 g / l after two doses (on the venous blood). Then, measures of weight, height, blood pressure and pulse were performed in selected topics. The listed diabetics were followed and appointments spaced three months they have been set for them to attend the talks held at the center Mark Sankale. During these talks, we asked them questions about their diet, physical activity, medications and family history. Finally, we made regular use of their records and analysis reports on urinalysis and throat and performed at the Analytical Laboratory of Biologics Medical at Abass NDAO hospital in Dakar (Senegal).

Results and Discussion

Distribution of diabetes by type and sex

In this study, 135 diabetics aged 12 to 87 years were identified on 1200 patients from getting access, a frequency of 11.25%. Of these 135 diabetics, 117 were type II, a frequency of 87% and 18 type I is a frequency of 13%. All diabetics had blood glucose of greater than 1.50 entry. The disease affects more women than men with 95 against 40, or 70.40% of diabetic women against 29.60% men. (Table I).

Distribution of diabetes by age, BMI, family history

In our work, some risk factors for diabetes were noted: the body mass index (BMI) was calculated to check obesity, heredity and age. In addition to these factors related to diabetes, we could detect several complications and risk factors associated with these complications. Among these risk factors, we have a sedentary lifestyle that we have defined on the basis of the number of hours and the type of physical activity, whether moderate (activity duration <2 hours per day) or severe (life activity> 5 hours per day), but HbA1c, the presence or absence of hypertension and socio-professional categories. (Tables II, III and IV.)

Distribution of complications of diabetes by diet, physical activity, HbA1c and the presence or absence of hypertension

Regarding the evolution of the disease, 78 diabetics among 135 study had complications or 57.77% of diabetics. Several risk factors have been identified in developing diabetic complications: all diabetics who have had strokes drank alcohol and smoked at the same time. All diabetics with tenure of more than 7 years disease had complications. For diabetic nephropathy only three cases have been observed in diabetic parents. Apart from these complications, other complications were recorded.

The operating results of the analysis allowed us to find that of the 135 diabetics, 51 had infections, or 37.77% of them, moreover, among the 51 diabetics, 75.40% had glycemic equilibrium with HbA1c greater than 7%. Germs encountered are divided as follows: 11.85% in Escherichia coli Klebsiella pneumoniae 9%, Candida albicans at 4.4% in Serratia sp 3.70% 2.96% with Proteus vulgaris, Proteus mirabilis in 2 , 96% and 1.48% in Staphylococcus diabetics. (Table III).

Distribution of developing diabetic complications according to their professional category

Also studied the distribution of 78 diabetics who developed complications according to their professional category. Patients are divided into three socio-professional categories: Category 1 is represented by wealthy social strata, that is to say, executives, senior officials (6 years after Baccalaureate), large traders, the second category is composed of small traders, civil servants (4 years below tray), the third category of workers, poor peasants, housewives without profession.(Table IV).

The alarming prevalence of diabetes in Senegal, estimated at 10% by the government, is confirmed by our results that assess 11.25%. Moreover, the presence of 87% of type II diabetes against 13% of type I is consistent with the WHO data (1,10). In relation to age, diabetes is more common in subjects aged 50 years and over with diabetes about 72 135 and appears rare in the age groups 12 to 20 years. These results confirm those of surveys conducted in

Congo, where the authors show the rarity of the disease between 10 and 20 years (2). Compared to the inheritance of the disease, 135 diabetics, only 15 had parents with diabetes which is a percentage of 11.11%. These results are similar to those found in 2010 in the center Sankale Mark (5). Besides genetics, other factors noted in our work are the BMI (body mass index). Of 135 diabetics, 99 have a BMI> 30 are obese, while only 36 have a BMI <30, which confirms the results presented by the WHO and the National Order of Physicians of Senegal (13). Note also that diabetes was more prevalent among women than among men, 95 cases against 40. Our results are in correlation with those found by previous studies (5).

As for the analysis of records of patients, it has highlighted the extent of the complications of diabetes and the complications found in our work are consistent with those of other authors. 78 of 135 diabetics had complications and the most common are cases of abortions (28.20%), diabetic foot (at 20.51%), neuropathy (at 11.54%), sexual weakness (at 10.26%) and dental infections (at 10.26%). Our results confirm those previously found by different authors, which shows the extent of diabetes complications (8, 5, 4, 12). Other complications were also reported, such as kidney failure, stroke and myocardial infarction, but they appeared less represented because they come at a very advanced stage of the disease. Our results confirm those found by the medical department of internal medicine of Abass Ndao (6.5) hospital. The occurrence of these complications is due largely to poor management of the disease or other related factors. In our study, we found several factors related to complications (physical inactivity, poor diet, hypertension, HbA1c, duration of diabetes, smoking, alcohol). Indeed, among the 78 cases reported, 73% had a very unbalanced, and only 27% complied with the diet suggested by your doctor abnormal regime, in addition, 57.70% practiced a very moderate physical activity (or inactivity tends), against 42.30% who had an intense physical activity 62.82% live with hypertension and 75.64% had HbA1c greater than 7%. Our results confirm those found by the heart Canadian in Canada and by other authors (4, 14.3).

It should also be noted risk factors such as alcohol, age, duration of the disease have been recorded in our subjects in some complications such as stroke, results that correlate with those of WESDR and the UKPDS India (11, 14.3). The results obtained from the use of analysis reports of diabetics show the extent of bacterial infections with 37.77% of diabetics who suffer, they can note a very important risk factor associated with these infections: it s' is the increase in HbA1c (> 7%). In fact 75.40% of diabetics developing infections glycemic control with HbA1c greater than 7%, consistent with results obtained in India WESDR and UKPDS in India (3, 12,14).

In relation to occupational categories we found that the poorest layers are more vulnerable to complications of diabetes with 66.26% as not having sufficient means for the treatment, our results confirm those of studies conducted in 2012 in the urban population of Dakar and those obtained in Cotonou, Benin (7.2).

Table.I Distribution of diabetes by type and sex

Types of Diabetes	Diabetics		Total
	men	Women	
DID	9	9	18
DNID	31	86	117
Total	40	95	135

Table.II Distribution of diabetes by age, BMI, family history

Age (years)	BMI (KG/m2)		Family history	
	BMI >30	BMI ≤ 30	Parents diabétics	Parents healthy
12 _ 20	6	1	2	4
20 _ 30	7	0	1	7
30 _ 40	13	07	2	18
40 _ 50	16	11	2	25
50 _ 60	32	12	8	36
> 60ans	25	3	5	23
Total	99	36	15	120

Table.III Distribution of complications of diabetes by diet, physical activity, HbA1c and the presence or absence of hypertension

Complications	Type of Plan		physical activity		HbA1c		HTA		%
	normal	abnormal	Moderate	Intense	HbA1c <7%	HbA1c % ≥7%	Present	Absent	
AVC	1	2	3	0	1	2	2	1	3,8
dental infections	1	7	8	0	0	8	5	3	10,26
renal Insufficiency	0	3	2	1	0	3	3	0	3,8
Myocardial infarction	0	5	4	1	0	5	3	2	6,4
diabetic foot	7	9	6	10	5	11	9	7	20,51
neuropathy	3	6	5	4	4	5	5	4	11,54
retinopathy	2	2	2	2	2	2	2	2	5,13
Sexual weakness	2	6	4	3	1	7	6	2	10,26
abortion	5	17	10	12	6	16	14	8	28,20
Total	21	57	45	33	19	59	49	29	
%	27%	73%	57,70%	42,30%	24,36%	75,64%	62,82%	37,18%	100%

Table.IV Distribution of developing diabetic complications according
to their professional category

categories	1	2	3	**Total**
Number of cases	11	20	47	78
Percentage %	14,10	25,64	60,26	100

Diabetes appears to be a widespread disease with a frequency of 11.25% in Abass NDAO Hospital in Dakar. The rapid growth in the prevalence of diabetes in Senegal, is both a reality and a threat as shown by the recent editorial Hossain et al. : Obesity and Diabetes in the Developing World: a growing challenge (11). This disease affects both men and women (more prevalent in women). In relation to age, incidence of diabetes is quite significant in the age group 50 years and older. Complications and infections are associated with many risk factors such as hypertension, greater than 7% HbA1c, sedentary lifestyle, socio-economic factors and the duration of the disease.

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