

Prevalence of diabetes in a semi-urban community in northern Nigeria.

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Abstract

Background: Diabetes mellitus is a growing public health problem both in developing and developed nations. The prevalence of diabetes globally is projected to rise from 2.8% in 2000 to 4.4% in 2030. This study was conducted to assess the prevalence of diabetes in Dakace village, near Zaria

Method: This study was part of a larger study to assess the prevalence of cardiovascular disease risk factors among adults in Dakace village, near Zaria. Out of a total of 492 eligible respondents for the study, a subsample of 199 persons was recruited using a systematic sampling technique had their fasting blood glucose levels determined. Body mass indices of the participants were also determined.

Results: A total of 199 subjects (94 males and 105 females) participated in this segment of the study. Three subjects had fasting blood glucose (FBG) of more than 7.0mmol/L; one participant a previously known diabetic on medication had a good glycaemic control. The overall prevalence of diabetes was 2.0%. Five participants (2.5%) had impaired fasting glucose (IFG). Among the diabetics, one was overweight (BMI= 27.43Kg/m²) and one was obese (BMI=31.55Kg/m²), while among those with impaired fasting glucose two were overweight. Forty-three subjects (21.6%) were overweight and 15 (7.5%) were obese.

Conclusion: The prevalence of diabetes mellitus in this semi-urban community is keeping with what had been reported earlier from across the country.

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Introduction

Diabetes mellitus is a growing public health problem both in developing and developed nations^{1, 2}. The number of people with diabetes is increasing due to rapid population growth, urbanization, population aging, and increasing prevalence of obesity and physical inactivity². The increase shall be highest in sub-Saharan Africa due to aging population and urbanization. Globally, it is projected that the prevalence of diabetes will rise from 2.8% in 2000 to 4.4% in 2030³. This translates³, in

numerical terms to 171 million in 2000 and 366 million people in 2030. The striking feature of this rise is that Sub-Saharan Africa will have disproportionately larger proportion of the rise due to disproportionate increase in the percentage of people in the urban areas and percentage of people above 65 years of age. Accordingly, percentage of people with diabetes in 2000 will increase by 161% by the year 2030. This is the highest increase recorded by any of the world's regions².

In Nigeria, a national survey in 1992 estimated the prevalence of diabetes to be 2.7% while the age-adjusted prevalence was 2.2% with wide variations between rural and urban populations³. Lagos being the most populous and urbanized center had the highest prevalence of 7% (Lagos Mainland) while Mangu in North Central region had the lowest prevalence of 0.6%³. Earlier in 1999, the prevalence of diabetes among adults in two suburban populations in northern Nigeria was reported to be 1.6%⁴. These suburban communities were 30 and 32km from Zaria. This study was conducted to assess the prevalence of diabetes mellitus in Dakace, a semi urban community near Zaria

Methods

The survey was part of a larger study to assess the prevalence of cardiovascular disease risk factors among adults in Dakace village, near Zaria⁵. Dakace village is located about 10km from Zaria in the heart of northern Nigeria along Zaria-Jos Highway. In 2005, Dakace village had a projected population of 4860 people. It is distinctly divided into two main settlements: (i) Dakace village and (ii) Mangu Dakace. Hausa people whose roots are from the ancient city of Zaria are the predominant inhabitants of Dakace village. It is divided into five traditional Hausa ward: *Kanawa, Kofan Gabas, Runji, Kofan Yamma* and *Ruga*. Mangu Dakace is the newly developed area where the population is of diverse ethnic groups but predominantly inhabited by the *Mangus* (from Jos-Plateau) hence the name, *Ikulus* and *Katafs* (all from Kaduna State). This section has three wards bearing the tribal names of the inhabitants i.e. *Ikulu, Mangu* and *Kataf*.

All males and females aged 15 years and above constituted the study population. Included also in the study are known hypertensives and diabetics, including those on antihypertensives and/or antidiabetic medication, while those excluded from the study were pregnant and lactating mothers.

Sampling technique

Cluster sampling method was used to select respondents. Each of the eight *angwas* that made up the study area was considered to be a cluster. Two wards from the original settlement (*Kanawa* and *Ruga*) and one ward from the newly developed area (*Kataf*) were selected using a simple random technique by balloting based on proportional distribution of the population between the two settlements. In each of the sampled ward, all eligible respondents were identified by a household census and from this census a sampling frame was constituted. In all 492 eligible subjects were identified for the study. The identified eligible respondents were invited to participate in the study and at the end 424 participated. For the purpose of constituting a subsample on which fasting blood glucose were determined, systematic sampling technique was employed from the sampling frame of the eligible respondents already prepared. A total of 199 subjects were selected for fasting blood glucose estimation. For the purpose of measuring fasting blood sugar (FBG), eligible persons were instructed to convene at the primary health center of the community in the morning of specific days following an overnight fasting of at least 8 hours. Individuals below the age of 15 years and pregnant women were excluded from the study. A questionnaire was used to collect information on age, sex, occupation, height and weight. Height was measured to the nearest 0.5 cm without shoes, with the individual standing on a wooden platform and against a meter rule placed on the wall. Weight was measured to the nearest 0.5 kg using a portable electronic solar powered scale Seca model (UNICEF). About 5 ml of venous blood was collected from the recruited subjects. All the collected samples were immediately analysed in the chemical pathology laboratory of Ahmadu Bello University Hospital. Serum glucose was estimated using enzymatic reaction by glucose oxidase. Subjects with FBG of more than 6.1 mmol/L (for serum) and 7.0 mmol/L (for plasma) were considered to be diabetics. Those with FBG of between 5.6–6.0 mmol/L (for serum) and those with FBG between 6.1–7.0 mmol/L (for plasma) are considered to have impaired fasting glucose (IFG)⁶. Body mass index (BMI = Kg/m²) was calculated for all subjects and classified accordingly: overweight as BMI of 25.00–29.99 Kg/m², obesity as BMI of 30.00–39.99 Kg/m².⁷

Results

A total of 199 subjects (94 males, 105 females) participated in this part of the study. The ages ranged from 15–84 years with a mean of 39.9 years. The age-sex distribution is shown in table I. Fifty-eight (29.1%) of the subjects had elevated BMI of above 25.0 Kg/m² of which 15 (7.5%) had BMI of above 30.0 Kg/m² while 43 (21.6%) had BMI between 25.0 Kg/m² and 29.9 Kg/m². None of the subjects had a BMI of 40.0 Kg/m² and above. Three subjects had FBG of above 6.1 mmol/L, and one is a known diabetic on medications with controlled blood glucose (3.8 mmol/L). The prevalence of diabetes mellitus is approximately 2.0%. Five participants (2.5%) had impaired fasting glucose. The characteristics of these subjects are shown below in table II.

Table I. Age-sex distribution of respondents

	Male	Female	Total
15-24	13	15	28
25-34	21	41	62
35-44	15	25	40
45-54	10	9	19
55-64	17	15	32
65-74	15	-	15
75-84	3	-	3
Total	94	105	199

Mean Age = 39.9 years

Median Age = 37 years

Table II. Characteristics of the subjects detected with elevated fasting blood sugar and impaired fasting blood glucose

S/No	Age (years)	Sex	FBG (Mmol/L)	BMI (Kg/m ²)
1.	65	M	8.8	22.80
2.	83	M	8.8	19.19
3.	55	M	25.0	27.43
4.	50	F	6.3	25.97
5.	40	F	6.3	24.63
6.	29	F	6.0	21.89
7.	65	F	6.0	27.39
8.	37	F	6.0	22.68
9.*	70	M	3.8	31.55

* A known diabetic on medication.

Discussion

The prevalence of diabetes in this semi urban community was 2.0%. This figure is slightly higher than the reported prevalence of 1.6% in the two suburban populations of northern Nigeria⁴ and 1.4% in a rural population of Kwara State, Nigeria⁸.

A striking feature of this result is that all the detected diabetics were males and above 45 years of age confirming the general global pattern of higher prevalence among the males². Generally, prevalence of diabetes increases with age in both sexes up to around 65–70 years when prevalence in females overshoots that in males². In this study only one subject was with diabetes was below 60 years.

With regards to BMI, one of the diabetics was overweight with very high FBG of 25mmol/L. Only one, a previously diagnosed diabetic was obese, a result that is at variance with that conducted in a rural population of Kwara State, Nigeria⁸. Fifty-eight (29.1%) of these subjects had elevated BMI of above 25.0Kg/m²; overweight was found among 42 (21.6%) subjects and obesity among 15 (7.5%) of the subjects. The figure for overweight is comparable to that reported earlier: 21%⁵, 21.4%⁹; but for

obesity this is higher than that reported earlier of 4.2%¹⁰ and 6.4%¹⁰ but lower than the 13.3% reported among suburban populations of northern Nigeria⁵.

Although, the sample studied is small, this study serves as a prelude to larger studies where ideal oral glucose tolerance test may be administered.

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