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Prevalence and Risk Factors of Diabetes Mellitus in Eket, South-South Nigeria

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***Abstract*:** *Diabetes is a chronic debilitating and costly disease associated with severe threat to the attainment of the internationally agreed developmental goals. Many cases of diabetes die of acute complications, are not diagnosed, or are not presented to hospitals due to poverty and lack of health insurance. This study was a survey carried out in five communities in Eket, South-south Nigeria. A total of 332 individuals, aged ≥ 18 years, out of the 400 individuals randomly selected, presented themselves for the survey. Socio-demographic data, diabetic risk factors including Body Mass Index, Waist and Hip Ratio and Blood glucose concentration (FBS, RBS and OGTT) were obtained and recorded for each subject. The overall prevalence of diabetes mellitus in the study was 13.55% (8.1% for males and 5.4% for females). Among this, the prevalence of undiagnosed diabetes was 82.2%. Thirty out of the 45 diabetic cases in the study were amongst subjects younger than 50 years with the highest number of subjects aged 31-40. The measures of obesity (BMI and WHR) were highest among the diabetic. The conveniences of modern life resulting in popularity of high fat diets, consistent sedentary lifestyle and reduced access to health care facilities are some factors that contribute to the rise in diabetic cases even in sub-urban communities.*

Keywords: Diabetes mellitus, Body Mass Index, Blood Glucose Concentration, Obesity

I. Introduction

Overtime, diabetes mellitus has emerged as a global healthcare problem that has reached epidemic proportions. The international Diabetes Federation (IDF) estimates suggest that 380 million people will be affected by 2025 with one person dying every 10 seconds. Diabetes now constitutes the highest morbidity and mortality of all chronic non-communicable diseases in Africa, but with rapid urbanization and change in lifestyle and nutrition in the 21st century, there has been a rise in the disease and its complications. A 2012 report by IDF stated that most of the populous countries in Africa also had the highest number of people with the disease. Nigeria has the highest number of people (3 million) followed by South Africa (1.9 million), Ethiopia (1.4million) and Kenya (769,000). (IFD, 2013).The crude prevalence of diabetes mellitus in National Survey conducted in males and females below the age of 43 was 1.6% and 1.9% respectively; with a three-fold increase after the age of 45 to 5.4% and 5.6% in males and females respectively (Akinkugbe, 1997). A descriptive study by Aguocha *et al.,* (2013) revealed that out of 1,124 diabetic patients admitted between 2000 and 2004 in a tertiary health care facility in South-east Nigeria, 13.82% died. Nyenwe *et al.,* (2003) also found that 34 out of the 502 subjects screened in Port Harcourt town South South Nigeria had diabetes. In Abeokuta, Ogun State, South West Nigeria, 27 out of 182 subjects screened, tested positive for diabetes (Akinjinmi *et al.,* 2014). These reports are clear indications that the disease is spreading widely and silently in the Nigeria. The prevalence of diabetes in Eket is not known. The city has undergone rapid transformation in recent years as a result of the boost in petroleum and education facilities, and increasing influx of people from all over the world. Lifestyle is becoming increasingly westernized. This study investigated the prevalence and risk factors of diabetes mellitus in Eket.

II. Materials And Methods

Eket is the hub of oil and gas business because of the abundant deposit of crude oil, with more than 250 companies providing support services such as catering, flights, exports and education. It is the second largest city in Akwa Ibom State, occupying the South central portion spanning northwards 4.33^0 and 4.45^0 and eastwards between longitudes 7.52^0 and 5.02^0. The ethnic groups resident in Eket include Ibibio, lgbo, Yoruba, Hausa, Fulani, Ijaw, Igala and expatriates from different parts of the world. The survey was carried out in five communities in Eket (Ikot Udota, Idua, Ukwa, Afaha Attai and Nduo Eduo). A total of 332 individuals, aged ≥ 18years, out of the 400 individuals randomly selected, presented themselves for the survey. Socio-demographic data were obtained for the study. The weight of the subjects was measured to the nearest kilogram using a weighing scale. The height was measured to the nearest centimetre. Body Mass Index (BMI) was calculated. The waist and hip circumferences were measured to the nearest 0.5cm wearing minimal clothing, and the Waist/Hip ratio (WHR) was calculated.

Blood Glucose Concentration (BGC) of subjects was assessed using the *Lifescan Onetouch* glucometer and test strips. Random Blood Sugar (RBS), Fasting Blood Sugar (FBS) and Oral Glucose Tolerance (OGT) were assayed. Subjects who had FBS levels ≥ 126mg/dl and were not previously diagnosed with diabetes mellitus were subjected to 75g Oral Glucose Tolerance Test and blood glucose levels tested two hours after glucose load. Subjects who were diabetic were exempted from the OGTT.

III. Results/Discussion

Out of the 332 subjects in the survey, 61 subjects had RBS levels ≥ 200mg/dl, 55 subjects had FBS levels ≥ 126mg/dl, out of which, 8 had previously been diagnosed of diabetes mellitus and 5 showed classical symptoms of diabetes, hence were excluded from the OGTT. Thirty-two (32) out of the remaining 42 subjects with FBS levels ≥126mg/dl had blood glucose levels ≥200mg/dl after two hours of intake of 75g glucose drink as shown in Table 1. The percentages of diabetic's cases from the study are presented in table 2.

Table 1: Blood Glucose Concentration of Subjects

Blood glucose Test	Number of Subjects	Percentages
RBS		
<200mg/dl	271	81.6
≥200mg/dl	61	18.4
FBS		
<100mgdl	188	56.6
101-125mg/dl	89	26.8
≥126mg/dl	55	16.6
OGTT		
<140mg/dl	2	4.8
140-199mg/dl	8	19.0
≥200mg/dl	32	76.2

Table 2: Diabetic Cases

Variables	Number of Subjects	Percentages
Diagnosed previously		
Male	5	11.1
Female	3	6.7
Undiagnosed with obvious symptoms		
Male	1	2.2
Female	4	8.9
Diagnosed during the study		
Male	21	46.7
Female	11	24.4

Table 3: Prevalence amongst Gender, Age and Ethnic Groups

Variables	No. tested	No. with DM	% of DM
Gender			
Male	234	27	60
Female	98	18	40
Age group			
18-30	67	7	15.6
31-40	108	15	33.3
41-50	83	14	31.1
>50	74	9	20.0
Ethnicity			
Ibibio and other indigenous tribes in Akwa Ibom State	136	14	31.1
Igbo	65	8	17.8
Hausa/Fulani	51	11	24.4
Yoruba	23	5	11.1
Other Nigerian tribes	39	6	13.3
Expatriates	18	1	2.2

Table 4: Risk Factors Associated with Diabetes Mellitus

Variable	All subjects	Diabetic subjects	% of DM subjects
BMI			
<25	179	22	48.9
≥25	153	23	51.1
WHR			
<0.85	78	16	35.6
≥0.85	253	29	64.4
Family history			
Present	75	24	53.3
Absent	257	21	46.7

IV. Discusion

Global estimates of diabetes prevalence have shown increases over the past 10-15 years. From 151 million in 2000, 194 million in 2003, 246 million in 2006, 285 million in 2010, 366 million in 2011 and 382 million in 2013, it is projected that the number of adults with diabetes will be 592 million by 2035 (Guariguata *et al.*, 2013).

The prevalence of diabetes mellitus in this study is presented in table 3. The study shows a figure of 13.55% (8.1% for males and 5.4% for females). This figure is comparable to most recent studies in other urban communities in the nation – 14.8% in Abeokuta, 6.5% in Calabar and 6.8% in Port Harcourt (Akinjinmi *et al*., 2014; Enang *et al.,* 2015 and Nwenye *et al.,* 2003). However, Ejike *et al.,* (2015) reported a 3.0% prevalence in Umudike, a suburban area in South east Nigeria. It is understandable that increases in diabetes prevalence are driven by rapid development and subsequent changes in lifestyle, this explains the higher prevalence in urban areas compared to semi-urban areas. The prevalence of undiagnosed diabetes was 82.2%. Such high prevalence is expected in low and middle income counties (Chou *et al.,* 1994; Elbagir *et al.,* 1996; and Chow *et al.,* 2006) where the cost of regular medical accessibility is unaffordable and there is widespread of myths about illnesses.
Type 2 diabetes, (T2D) is estimated to account for 90% of all adult diabetes. The risk for developing T2D is associated with old age, obesity, family history of diabetes, history of gestational diabetes, impaired glucose metabolism, physical inactivity and race/ethnicity. As indicated in table 3, thirty out of the 45 diabetic cases in the study were amongst subjects younger than 50 years with the highest number of subjects aged 31-40. Studies by Ejike *et al.,* (2015), Enang *et al.,* (2015), Akinjinmi *et al.,* (2014), Chineye *et al.,* (2008) and Nwenye *et al.,* (2003) showed a similar trend. In economically more developed countries, diabetics are usually older than 60 years. This disparity may be blamed on poor state of health care (Guariguata *et al.,* 2013) but is most likely a consequence of changes in lifestyle. Technology users of all ages are becoming increasingly more sedentary in lifestyle. The number of people who develop long term conditions resulting from physical inactivity is also increasing.

As can be seen in table 4, the measures of obesity (BMI and WHR) were highest among the diabetic. BMI as an instrument is known to be unable to differentiate sufficiently between bone, muscle and fat mass such that an individual may be obese by BMI standards yet present normal metabolic profile. However, WHR is a reflection of abdominal obesity which is known to trigger changes to the body metabolism that cause adipose tissues to release increased amounts of fatty acids, glycerol, hormones, pro-inflammatory cytokines and other factors that are involved in development of insulin resistance hence poor control of blood glucose level. Tremendous increases in rate of T2D in recent years have been attributed primarily to the rise in obesity worldwide (Lean, 2000; Zimmet *et al.,* 2001; and Kodama *et al.*, 2014). This rise is also not unconnected with the conveniences of modern life resulting in popularity of high fat, high energy diets and convenient foods. Where 76.5% of an entire study population have WHR $\geq$0.85, there is an urgent need for public awareness on lifestyle modification especially as it borders on healthy nutrition.

V. Conclusion

There are alarming high rate of undiagnosed cases of diabetes which often result in end-stage organ damage that may be prevented by early diagnosis, management and treatment. This study has highlighted prevalence of diabetes mellitus in a setting where data on diseases are grossly lacking. It is therefore imperative on everyone and especially, government agencies and health-care providers, to create awareness and make access to health-care facilities easy and affordable.

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