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STUDIES ON DIABETES MELLITUS AND ITS PREDICATORS IN IFAKALA COMMUNITY, MBAITOLI LOCAL GOVERNMENT AREA OF IMO STATE NIGERIA

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ABSTRACT

Diabetes mellitus is a silent killer. Diabetes affects people worldwide and poses major public health and socio economic challenges. The study revealed a high prevalence (40.9%) of diabetes mellitus. There was significant association between the prevalence of diabetes mellitus and the following factors; age group, obesity, alcohol consumption, tobacco consumption and high blood pressure (X^2=79.77, 109.03,73., 29.48, and 76.22; P< 0.05) respectively. Although prevalence of diabetes mellitus were more in females (43.3%) than males (36.6%) but was not significantly associated (X^2= 1.67; P> 0.05). The objective of the study is to determine the prevalence of diabetes and its predicators in Ifakala community, Mbaitoli LGA Imo State. It was a descriptive cross sectional community based study. Data for this analysis was collected from March -August 2019 from a population based of sample 403 out of 29,773 of total population. Demographic information, capillary blood glucose, blood pressure, weight and height, history was taken and recorded. The prevalence of hyperglycemia was 40.9%. The prevalence of diabetes was predominant among individuals age 50 years and below (77.6%). In this study, there were more female respondents (54.5%) than male respondents (45.5) with diabetes mellitus. According to this study 295 respondents (73.2) had normal weight, 77 respondents (19.1%) had over weight, 25 respondents (6.2%) were obese. Other studies have shown that individuals that are obese are at more risk of diabetes mellitus than those with normal weight. The study shows high prevalence of Diabetes mellitus among people of Ifakala. There is need for diabetes mellitus to be promoted with the aim to identify people with diabetes in other communities at earlier stage and provide prompt and adequate medical treatment.

KEYWORDS*: diabetes mellitus, predicators, Ifakala community.*

INTRODUCTION

Diabetes mellitus is a syndrome of impairment of the carbohydrate metabolism characterized by chronic hyperglycemia due to a defect in the insulin secretion and/or an inadequate in the hormone's function (Haerawati *et al.*, 2013; Obeagu and Obeagu, 2018, Obeagu, 2018[a]; Obeagu and Obeagu, 2018[b]). Elevated blood glucose level as the main feature of this disease is caused by failure of the pancreas in maintaining its function as the producer of insulin (Handelsman, 2011). Diabetes affects people worldwide and poses major public health and socioeconomic challenges. According to a declaration made in 2010 by the United Nations Secretary-general described diabetes and other non communicable diseases (NCDs) as "a public health emergency in slow motion." This is because they now present a greater threat than infectious diseases such as HIV/AIDS, Malaria, and tuberculosis (Arugo andMaduka, 2017). Globally, diabetes as a chronic metabolic disorder of multiple etiologies is assuming epidemic proportionswith an estimated 415 million adults affected in the world, and 14.2 million adults aged 20– 79 years have diabetes in the African region. There are more than 1.56 million cases of diabetes in Nigeria

and by 2040 this figure will be more than double (International Diabetes Federation, 2015). Besides, three quarters of people with diabetes live in low-and middle-income countries, while 12% of global health expenditure is spent on diabetes (International Diabetes Federation, 2015). Data from the World Health Organization (WHO), (2017) suggest that Nigeria has the greatest number of people living with diabetes in Africa.

Diabetes is often perceived as a disease of affluent countries; serious chronic diseases that lead to a substantial reduction in life expectancy, decreased quality of life, and increased costs of care. (Omiepirisa, 2013)

Diabetes mellitus can affect people of any age and socio-economic class. Not only does it lead to complication, diabetes mellitus also decrease quality of life and therefore, needs to be prevented and controlled (Nainggolan *et al.,* 2013).

Diabetes is preceded by impaired fasting glucose (IFG) resulting in a pre-diabetic state which can exist undetected for many years (Nathan, 2007), causing irreversible damage to vital organs. Pre-diabetes is a practical term referring to Impaired Fasting Glucose (IFG), impaired glucose tolerance (Ronald & Zublin, 2016) or a glycosylated hemoglobin (A1c) of 6.0% to 6.4%, each of which places individuals at high risk of developing diabetes and its complications.

Anecdotal evidence indicates that the residents of rural districts in the country may not be exempt from this transition. People who once had active lifestyles now exhibit sedentary lifestyles (such as hiring others as labor in farming activities, use of machines, and replacement of walking and use of bicycles with using motorcycles and cars). Many have also adopted Western diets. Rural districts are therefore unlikely to be insulated from the challenges posed by diabetes mellitus (DM) and its complications. There is, therefore, a need to empirically determine the prevalence of diabetes and its associated risk factors among adult residents in a representative rural district in the region (Arugo and Maduka, 2017).

The objective of this study is to determine the prevalence of diabetes and its predicators in Ifakala community, Mbaitoli, Imo State, Nigeria.

MATERIALS AND METHODS

Study area

The study was conducted among the rural population of Ifakala, Mbaitoli Local Government Area of Imo State, Nigeria. Ifakala has a population of 29773 at an annual growth rate of 3.2% (National Bureau of Statistics, 2010). It consists of 19 settlements with average house hold size of 5 persons. Most inhabitants are Igbos and Christians by religion.

Study Design

The study was a descriptive, cross-sectional community based survey conducted from March 9 – August 30 2019. Awareness for the program on DM and its predicators was created using circulars to Village Heads and schools, town criers and church announcements within the communities.

Population of the Study

The study included all consented members of the community both indigenous and non-indigenous. Criteria for inclusion was ability of the participants to be present, willingness to participate and ability to supply needed information and verbal informed consent to be tested irrespective of age, sex, race and ethnicity.

Sample Size and Sampling Technique

The sample size for this study is 403 determined using taro Yamanne Formula. Purposive sampling technique was utilized to select the sample for this study. Purposive sampling technique is a non probability sampling method that is selected based on characteristic pf a population and the objective of the study.

Data Collection

Data on demographic and behavioral characteristics were collected by trained personnel through a face-to-face interview using a semi-structured checklist. The field study team was composed of Qualified Nurses, Nurses-in-training and Supervisors. Data were collected using the structured WHO steps approach for Chronic Disease Surveillance. The checklist included questions for age, sex, educational status, marital status, physical activity, history of raised blood pressure, blood sugar and alcohol consumption.

Participants were fully examined and their anthropometric data recorded. Physical measurements of height and weight needed to calculate body mass index (BMI), and blood pressure were taken in this step. Blood pressure (BP) was taken in a sitting position using a manual and digital sphygmomanometer and stethoscope. Hypertension is defined as systolic BP of ≥140mmHg or diastolic BP of ≥90 mmHg. A portable weight and height scale was used to measure the weight of the participant wearing light clothes and heightin an erect position on bare foot standing on a flat surface and the result were recorded to the nearest 0.5cm. Then, body mass index (BMI) was calculated by weight in kilograms divided byheight in meters squared formula. BMI< 18.5 kg/m^2 is considered as underweight, 18.5–24.9 kg/m^2 as normal, 25–29.9 kg/m^2 as overweight, and ≥30 kg/m^2 as obese.

Fasting blood glucose was taken. After an overnight fasting (≥8 h), plasma glucose was determined using the glucose meter Accu-Chek/Freestyle Active system (World Health Organization, 2011). The Accu-Chek/Freestyle Active system use capillary blood sample which are set to plasma serum standard, showing results in plasma glucose values. This measurement was

immediately performed for all participants, and the results were recorded in the checklist between the hours of 8:30 am- 11:30 am. The diagnosis of DM was based on the American Diabetes Association diabetes mellitus classification criteria with fasting blood glucose of ≥126 mg/dl being considered as positive for DM; normoglycemic, FBG: ≤61 mg/dl to <110 mg/dl), and hypoglycemic,<61 mg/dl (American Diabetes Association, 2014).

For alcohol consumption, the categorized the participants into four groups based on the baseline (non-drinking > 5g, <30g/day, and > 30g/day) which means never drinking, light, moderate, and heavy drinking respectively (Jee, Fong, Hur and Samet, 2010 and lee, Foo, Kim et al; 2017)

Ethical Considerations

The permission to undertake the study was obtained from the school authority and the community heads. Details about the purpose of the study were provided to all the participants. Verbal consent and permission were duly obtained from all the participating individual before data collection. Confidentiality was observed. Participants identified with impaired fasting blood sugar and any other abnormality within the scope of the study were referred to the nearby comprehensive health facility for further investigation and management.

RESULTS

TABLE 1: DEMOGRAPHIC DATA OF THE RESPONDENTS.

VARIABLE	CATEGORY	FREQUENCY	PERCENTAGE (%)
AGE GEROUP	BELOW 30	43	10.7
	30-39	92	22.8
	40-49	84	20.8
	50-59	162	40.2
	60 AND ABOVE	22	5.5
GENDER	MALE	142	3.52
	FEMALE	261	64.7

TABLE 2: PREVALENCE OF DM BASED ON AGE GROUPS.

	PREVALENCE OF DIABETES MELLITUS		
VARIABLES	YES	NO	TOTAL
BELOW 30	5(11.6%)	38 (88.4%)	43
30-39	21 (22.8%)	71 (77.2%)	92
40-49	22 (26.2%)	62 (73.8%)	84
50-59	108 (66.7%)	54 (33.3%)	162
60 AND ABOVE	9(40.9%)	13(59.1%)	22
TOTAL	165 (40.9%)	238(59.1%)	403

X^2 =79.77 P<0.005

TABLE 3: PREVALENCE OF DIABETES MELLITUS BASED ON GENDER.

	PREVALENCE OF DIABETES MELLITUS		
GENDER	YES	NO	TOTAL
MALE	52(36.6%)	90 (63.4%)	142
FEMALE	113 (43.3%)	148 (56.7%)	261
TOTAL	165(40.9)	238 (59.1%)	403

X^2 =1.67; P>0.05

TABLE 4: ASSOCIATION OF DM BASED ON RISK FATORS.

	PREVALENCE OF DIABETES MELLITUS		
BODY MASS INDEX	YES(%)	NO(%)	TOTAL(%)
OBESSED	83 (76.9%)	25 (23.1%)	108 (26.8%)
OVER WEIGHT	62 (44.3%)	78(55.7%)	140 (34.7%)
UNDER WEIGHT	3 (9.1%)	30 (90.9%)	33 (8.2%)
NORMAL	17 (13.9%)	105 (86.1%)	122 (30.3%)
TOTAL	165 (40.9)	238 (59.1%)	403

X^2 =109.03; P< 0.05

TABLE 5: ALCOHOL CONSUMPTION AND PROMOTION OF DIABETES MELLITUS.

	PREVALENCE OF DIABETES MELLITUS		
PATTERN OF ALCOHOL CONSUMPTION	**YES (%)**	**NO (%)**	**TOTAL**
HEAVILY (≥30g/day)	43 (71.7%)	17 (28.3%)	60 (14.9%)
MODERATELY (<30g/day)	81 (55.5%)	65 (44.5%)	146 (36.2%)
LIGHT (≥5g/day)	36 (25.9%)	103 (74.1%)	139 (34.5%)
NEVER DRINKING	5 (8.6%)	53 (91.4%)	58 (14.4%)
TOTAL	165 (40.9%)	238 (59.1%)	403

X^2 = 73.8; P< 0.05

TABLE 6: TOBACCO CONSUMPTION AND PREVALENCE OF DIABETES MELLITUS.

	PREVALENCE OF DIABTES MELLITUS		
VARIABLE	**YES (%)**	**NO (%)**	**TOTAL**
YES	135 (50.4%)	133 (49.6%)	268 (46.7%)
NO	30 (22.2%)	105 (77.8%)	135 (53.3%)
TOTAL	165 (40.9)	238 (59.1%)	403

X^2 =29.48; P< 0.05

TABLE 7: ASSOCIATION BETWEEN BLOOD PRESSURE AND DIABETES MELLITUS.

	PREVALENCE OF DIABETES MELLITUS		
BLOOD PRESSURE	**YES (%)**	**NO (%)**	**TOTAL**
HIGH	113(65.7%)	59 (34.3%)	172 (46.7%)
LOW	2 (18.2)	9 (81.8%)	11 (2.7%)
NORMAL	50 (22.7)	170 (77.3%)	220 (54.6%)
TOTAL	165 (40.9%)	238 (59.1%)	403

X^2 = 76.22; P<0.05

DISCUSSIONS

The study is aimed to assess the prevalence of diabetes and its predicators among indigenes of Ifakala community.

The prevalence of diabetes in this study was 40.9%. This is higher than what was reported by Lucia (2012) and Sonny and Ekene (4.7%) (2011). The prevalence was also higher than 0.6% reported by Chinenye et al in Portharcourt (2012), 0.8% by Olatunbosun in Ibadan (1998), 1.43% by Erasmus et al in Ilorin, 1.% by Ohwonvonole et al in Lagos (1988). The prevalence was also lower than 2.2% reported by the Nigerian national Diabetes. In Tanzania, the prevalence reported by Mclarty was 0.9% (1974). Osuntokun et al (1971) reported a prevalence of 0.4% in a hospital based study. The prevalence was also lower than 4.6% reported by Shitty et al (2016) in Oyo State. The fact that this study was not a hospital based study may explain the difference in prevalence compared with other various studies.

Most of the respondents reported that they have been diagnosed of Diabetes Mellitus. Furthermore, some may have eaten before the assessment as it lasted up to 12pm Age and sex were identified as risk factors for diabetes mellitus. In this study, there was high prevalence amongst the females than the males.

Chukwunonso et al (2015) also reported a higher prevalence in females than males. This finding was also similar to that of Oyebade et al (2007) who reported female to male ratio 1:7:1. The Nigerian National non-communicable Disease Survey and other studies (1997) made similar observation. The large number of elderly women than men in most population is the likely reason for this observation. Age was significantly associated (X^2 = 79.77; P<0.05) with Diabetes mellitus but sex was not significantly associated (X^2 = 1.67; P>005)

This report in contrast with that of Amoah et al (2002), who observed a slightly higher preponderance among males than females. Generally prevalence and implication of diabetes are more pronounced in females than males as a result of gender associated adiposity. In the report of Shittu et al (2017), there was also female preponderance. According to Haerawati (2013), there were more female respondents (57.74%) than male (42.26%).

According to the results gotten from the respondents, the prevalence of diabetes mellitus was more amongst people aged 50 and below. This finding is consistent with that of Chieneye (2012). In developed countries, diabetes is usually seen in those older than 60 years. Johnson et al (1969) reported that the peak incidence of diabetes in Nigeria and Tanzania was 45-59years of age. The Prevalence of diabetes increases with age.

According to Nasheeta et al. (2014), the majority of individuals with diabetes in African were reported to be less than 60 years of age with the highest proportion (43.2%) in people aged 40-59years. Only 18.8% of diabetic individuals were 60-79years of age, probably because of the relatively small proportion of people in this age group.

Obesity is one of the precipitating factors in the development of diabetes mellitus. This is due to the fact that phospholipids prevent the uptake of insulin. According to the result 76.9% of those with diabetes mellitus were obsessed. This is in line with a study by Trisnawati (2013) in which obese group was more at risk of diabetes mellitus than non-obese group. Similarly, Sujaya (2009) found that individuals with obesity were more likely to develop diabetes mellitus than those without obesity. This finding is also in line with that of Haerawati (2013) found out that of Hawarati residents with diabetes mellitus were higher among those who were obese. This study also revealed a significant association (X^2 =109.5; p< 0.05) between body mass index and diabetes mellitus.

Some dietary patterns affected by globalization, acculturation and urbanization include alcohol, consumption. The study revealed an increase of prevalence of diabetes mellitus among heavy drinkers (71.7%) as against light drinkers (25.9%). Also, pattern of alcohol consumption is significantly associated with prevalence of Diabetes Mellitus (X^2 = 73.8; P<0.05). Currently, the prevalence of non-drinkers is higher in African region compared to Europe (Agyemang et al., 2009). Alcohol consumptions have been reported to moderately increase the risk of type 2 diabetes (Tuei and Maiyoh, 2010). A few studies have reported a link in rural South Africa; alcohol use was independently related to diabetes (Motala et al., 2003) and in Kenya frequent alcohol intake in men was associated with glucose intolerance. Therefore rising levels of consumption may likely contribute to higher diabetes prevalences noted in the study.

The study also revealed a highly significant association between increase in blood pressure and diabetes mellitus (X^2 = 76.22; P< 005). About 25% of people with Type 1 diabetes and also 80% of people with type 2 diabetes have high blood pressure (www.bloodpressureuk.org).

CONCLUSION

The study also revealed a highly significant association between increase in blood pressure and diabetes mellitus. About 25% of people with Type 1 diabetes and also 80% of people with type 2 diabetes have high blood pressure.

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