

BIOLOGICAL SCREENING, KNOWLEDGE AND MANAGEMENT OF DIABETES MELLITUS IN OBOHIA AHIAZU, MBAISE, IMO STATE, NIGERIA**AMADI, Anthonia Nnenna C. and NWOKORO, Ijeoma Ugochi**

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Corresponding Author: Amadi, A. N. C. Department of Zoology and Environmental Biology, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria. **Email:** an_amadi@yahoo.com
Phone: +234 8036677444**ABSTRACT**

Biological screening of diabetes mellitus was carried out to assess the prevalence of the disease in Obohia Ahiazu, Mbaise Local Government Area, Imo State. Glucometer (Accu-check) and Combi-9 strip were used to check for the presence of glucose in blood and urine, respectively. Three hundred (300) subjects were used for the study. Out of the 99 males 26(26.26%) and 54(26.87%) out of 201 females had pre-diabetes. Thirty nine (19.14%) females and 14(14.14%) were found to be diabetic. Females were more overweight than males. Urinalysis showed that 7(7.07%) of males and 18 (8.96%) were positive for the presence of glucose in urine. Result from the questionnaire indicated that out of the 268 respondents 71(26.47%) and 87(32.46%) believed that high consumption of sugar and starchy food were the cause of diabetes while 21(7.6%), 8(2.99%), 24(8.96%) and 42(15.67%) attributed diabetes to hereditary, alcohol induced and no idea about the cause respectively. Symptoms associated with the disease include frequent urination, excessive weakness, sexual dysfunction seventy seven persons (28.73%) believed that adherence to diet could help in the management of the disease while 44(16.42%) had no idea of the management procedures. Diabetes is one of the leading causes of death globally. There is therefore the need for regular screening test of individuals especially those in the rural areas by government and relevant agencies to diagnose the disease on time minimize or avert the risk of health complications and effect treatment and management techniques. Also health education and public enlightenment of the populace about the disease intensified.

Keywords: Biological Screening, Diabetes mellitus, Diabetes symptoms, Management techniques**INTRODUCTION**

Diabetes mellitus is caused by metabolic disorder in the body as a result of insufficient production of insulin or factors that oppose the action of insulin (Kazeem, 2005). Insulin is a hormone that is needed in the body to control the rate at which sugar, Starch and other food are converted into glucose required as energy for daily life. It helps to maintain the blood glucose level within a normal range.

World Health Organization (1999) puts the normal range of blood glucose between 60

– 126 mg/dl (before taking any food for the day i.e. fasting blood sugar). In health, despite several demands for glucose in different situations blood glucose rarely exceeds this value and when it does it results to hyperglycemia resulting from defects impaired in insulin secretion and / or its effectiveness. The disease diabetes mellitus is of public health importance because there is an evidenced of its increase worldwide.

According to the international diabetes federation, there are currently 371 million people living with the disease world wide and

another 280 million at high risk of developing the disease. In Nigeria about 6 million people have diabetes with majority of the patients suffering from type 2 diabetes (Elbagin *et al.*, 1998). Diabetes is caused by either genetic factors such as exposure to chemical or habits among other factors.

Diabetes can be classified into: insulin dependent diabetes mellitus (type 1), where the patients usually require exogenous insulin (Gordon *et al.*, 2000). Non-insulin dependent diabetes mellitus (type 2) which occurs mainly among the middle aged and the elderly and does not necessarily require exogenous insulin (Shoback, 2011) and gestational diabetes which occurs among pregnant women (Lawrence *et al.*, 2008).

Diabetes have various complications among which are diabetic nephropathy that could lead to kidney dysfunction, diabetic neuropathy that could lead to diabetic foot ulcer and diabetic retinopathy this can lead to total blindness if not properly managed (Boussageon *et al.*, 2011). Diabetes is diagnosed when ones fasting blood glucose is 126 milligrams or more per 100 millilitres of blood (WHO, 1999; Gordon *et al.*, 2000). Due to late diagnosis among Africans, retinopathy is present in up to 21 – 25% of type 2 diabetes and 10% in type 1 diabetic patients (Sobngwi *et al.*, 2001).

Dietary control is an important aspect of the management of diabetes. Diabetes mellitus is a non communicable disease with a rising prevalence world wide most of the increase in prevalence is projected to be in developing countries. Whitehouse (1982) recognized diabetes as a major health problem. Yet there remains a dearth of understanding and information about the disease in Nigeria. It is therefore expedient that screenings are undertaken to diagnose the disease in individuals as early as possible to minimize the risk of complications. Education of the populace on the need for regular screening tests, adherence to diet and medication and also need for regular exercise emphasized as latest discovery showed that regular exercise plays a great role in managing and prevention of diabetes (Morehouse and Miller, 1976). The aim of this study was to determine the incidence of

diabetes mellitus in Obohia Ahiazu, Imo State, Nigeria using biological screening apparatus which include glucometer (Accu-check) and Combi-9.

MATERIALS AND METHODS

This study was carried out at Obohia Ahiazu, Mbaise Local Government Area of Imo State, Nigeria. The inhabitants of Obohia Ahiazu are mainly farmers and of low economic status. The community has a health center, a cottage hospital owned by the Anglican Church and a private owned hospital where community members obtain health checks and treatment whenever they are sick.

Permission to conduct the study was obtained from the village heads and the priest in various churches in the community. An advocacy call was made by the researcher in order to enlighten the people on the importance of the test.

Data collection schedule sheet was used to elicit information on the disease and questionnaire was used to assess the people's level of knowledge, attitude and management practices of the disease. Information gathered from the questionnaire included age, causes and symptoms, and management techniques. Questionnaire was administered to the people before the screening process. The educated once among them were allowed to respond to the questions unguided, while the illiterates were assisted and clarifications made where necessary. The questionnaire were collected back immediately to ensure high percentage of return.

The screening was done using an Accu-Check and Combi-9. Sterile lancet was used to pick the thumb and a drop of blood was collected and placed on the indicator point of the test strip and inserted into the glucometer to check the level of fasting blood glucose.

Sampling was done in the morning before breakfast Fasting blood glucose of above 126 mg/dl was considered high blood sugar (hyperglycemia) (WHO 1999). Combi-9 strip was used to check for the presence of glucose in urine sample collected immediately in order to compare the results. The appearance of

yellow to light green colour on the test strip indicated negative to normal but as the green colour intensifies it indicated the quantity of glucose in the urine and this is read off the Combi-9 test kit specification which indicated the level of glucose in the urine as 50mg/dl(+), 150 mg/dl (++) and 500mg/dl (+++).

Weight and length data of participants were obtained and used in calculated the nutritional indices as well as the body mass index (BMI). All data collected were analyses in percentages and the results presented in tables.

RESULTS

Majority of the males sampled were within the 41 – 50 age range, while majority of the females were within 51 – 60 age bracket (Table 1). Out of 99 males 26(26.26%) and 201 females 54(26.87%) had pre-diabetes (Table 2). Thirty nine (19.41%) females and 14 (14.14%) males were found to be diabetic. More females 51(25.37%) were overweight than males 15(15.15%) (Table 3). No overweight and obese male was recorded during the study, while 24 obese females were recorded (Table 4). Urinalysis showed that 7(7.07%) males and 18(9.00%) females were positive for the presence of glucose in urine (Table 5). Results from questionnaire indicated that out of 268 respondents 71(26.47%) and 87(32.46%) respondents believed that high consumption of sugar and starchy food were the cause of diabetes, while 21(7.67%) 8(2.99%), 24(8.96%) and 42(15.67%) attributed diabetes to hereditary, alcohol induced and no idea about the cause, respectively. Symptoms associated with the disease include frequent urination 64(23.88%), excessive weakness 49(18.28%) and sexual dysfunction 38(14.18%).

Seventy seven person (28.73%) believed that adherence to diet could help in the management of the disease while 44 (16.42%) had no idea of the management of the disease (Table 6).

DISCUSSION

Diabetes is common among males and females and can affect people of all ages but more prevalent among the elderly. This is similar to the observation made by Smith (1994) who observed that diabetes affects all ages in any sampled population.

Table 1: Distribution of subjects by age groups and sex

Age group	Number	%
Male		
20 – 30	9	9.38
31 – 40	9	9.38
41 – 50	27	28.13
51 – 60	18	18.75
61 – 70	24	24.24
71 ⁺	12	12.50
Total	99	100
Female		
20 – 30	15	7.46
31 – 40	24	11.76
41 – 50	48	23.53
51 – 60	69	33.82
61 – 70	27	13.24
71 ⁺	18	8.82
Total	201	100

Table 2: Incidence of fasting blood sugar (FBS) in male and female

FBS Interval	Number	%
Male		
60 – 70	0	0
71 – 80	3	3.03
81 – 90	26	26.06
91 – 100	30	30.30
101 – 120	26	26.26
121 – 200	11	11.11
201 – 300	3	3.03
Female		
60 – 70	0	0
71 – 80	9	4.48
81 – 90	18	8.96
91 – 100	81	40.29
101 – 120	54	26.87
121 – 200	27	13.43
201 – 300	12	5.97

60 – 100 mg/dl = normal, 121 – 126 mg/dl = pre diabetes, above 126 mg/dl = diabetes

Table 3: Incidence of weight in male and female diabetes in Obohia Ahiazu, Mbaise, Imo State, Nigeria

Weight Interval	Male	%	Female	%
30 – 40	6	6.06	6	2.98
41 – 50	17	17.17	42	20.59
57 – 60	32	32.32	57	27.94
61 – 70	29	29.29	45	22.06
71 – 80	9	9.38	30	14.17
81 – 90	6	6.25	9	4.41
91 – 100	0	0	9	4.41
101 – 200	0	0	3	1.47
Total	99	100	201	100

70 kg = average male (normal weight), 6.1.1 kg = average female (normal weight), 60.7 – 70 kg = general range of average weight.

Table 4: Distribution of body mass index (BMI) of male and female diabetes in Obohia Ahiazu, Mbaise, Imo State, Nigeria

BMI Interval	Male	%	Female	%
12.0 – 14.0	0	0	3	1.49
14.1 – 16.0	0	0	3	1.49
16.1 – 18.0	3	3.03	12	5.97
18.1 – 20.0	24	24.24	48	23.88
20.1 – 22.0	18	18.18	30	14.93
22.1 – 24.0	27	27.27	42	20.89
24.1 – 26.0	9	9.09	9	4.48
26.1 – 28.0	9	9.09	24	11.94
28.1 – 30.0	9	9.09	6	2.99
30.1 – 32.0	0	0	9	4.48
32.1 – 34.0	0	0	12	5.97
34.1 ⁺	0	0	3	1.49
Total	99	100	201	100

18.5 – 25.0kg/m² normal, 25 – 29kg/m² overweight, above 30kg/m² obesity

Table 5: Incidence of glucose in urine of male and female diabetes in Obohia Ahiazu, Mbaise, Imo State, Nigeria

Age group	Male	Positive urine test (%)	Female	Positive urine test (%)
20 – 30	9	0(0.00)	15	0(0.00)
31 – 40	9	0(0.00)	24	1(5.56)
41 – 50	27	1(3.70)	48	3(6.24)
51 – 60	18	4(22.22)	75	11(14.67)
61 – 70	24	1(4.17)	21	2(9.52)
71 ⁺	12	1(8.33)	18	1(5.56)
Total	99	7(7.07)	201	18(9.00)

According to the standard set by World Health Organization (1999) it is observed in Obohia Ahiazu, Imo State, Nigeria that 14.14% of the males and 19.40% of the females were diabetic, while 26.26% of the males and 26.87% of the females were at the pre-diabetic stage. More females are overweight than the males and are

at higher risk of developing diabetes as obesity is one of the risk factor associated with the disease. This was in line with observation made by Kazeem (2005) that three quarters of all type 2 diabetes patients were obese and had sedentary life style. Males (7.07%) and females (9.00%) had their urine positive for sugar and

according to Landry and Bazari (2011), glucose only showed up in the urine one it has reached high levels in the blood. Most of the respondents were away of the possible causes and symptoms of diabetes.

Table 6: Distribution of respondents based on causes signs and symptoms and management techniques of diabetes mellitus

Signs and causes	Frequency (%)
Starchy food	71(26.49)
High consumption of sugar	87 (32.46)
Hereditary	42 (15.67)
Alcohol induced	21 (7.84)
Overweight	24 (8.96)
No idea	33 (12.50)
Symptoms	
Frequent urination	64 (23.88)
Excessive weakness	49 (18.28)
Sudden weight loss	46 (17.16)
Sexual dysfunction	38 (14.18)
Sugar ants around urine	43 (16.04)
Loss of appetite	28 (10.48)
Management techniques	
Adherence to diet	77 (28.73)
Regular Exercise	10(3.73)
Adherence to prescribed medication	70(26.12)
Regular screening tests	67(25.00)
No idea	44(16.42)

Our reports were similar to observations by kinnear (1963), Gordon *et al.* (2000) and Cooke and Plotnick (2008) that high intake of sugar and genetic factors can lead to diabetes while the most common symptom is frequent urination. They mentioned other symptoms which include frequent infection and impaired vision. Findings of this study showed that diabetes mellitus affects both sexes and all ages as all are exposed to the same risk factors. Similarly, the disease is more prevalent among the elderly. There is therefore the need to educate the populace especially the young ones on how to avoid and manage diabetes at old age and also institute screening centers by the government and relevant agencies to carryout effective health education campaign in urban

and rural areas especially at the rural areas as many people are not aware of the causes, signs and symptoms and management techniques of the disease. Also drugs for treatment and management to be provided. It was also observed that actual cause of diabetes is not known and hereditary is implicated in some cases, there is need to educate the populace especially during marriage, couple should make sure that both partners do not have family history of diabetes. This will go a long way to reducing the chances of transferring the disease genetically to their children. Diabetes mellitus is a chronic and slow killer disease which cannot be easily cured except when dictated earlier can be better managed. Its management concentrates on keeping blood sugar levels as close to normal (euglycemia) as possible without causing hypoglycemia. This is usually accomplished with diet, exercise and use of appropriate medications (insulin in the case of type 1 diabetes, oral medication as well as possible insulin in type 2 diabetes). Patients education, understanding and participation is vital, since the complications of diabetes are far less common and less severe in people who have well managed blood sugar level (Nathan *et al.*, 2005). Attention should also be paid to health problems that may accelerate the deleterious effects of diabetes e.g. smoking, elevated cholesterol levels, obesity, high blood pressure and lack of exercise.

Finally, a multi sectoral and psycho-social approach through coordinated advocacy involving government at all levels, non governmental and relevant agencies should be adopted towards prevention and treatment of the disease. Some health tips according to Kazeem (2005) can help reduce diabetes risk. These include (i) weight reduction, average body weight is essential e.g. body mass index less than 25kg/m² for male and less than 24kg/m² for females is recommended. (ii) Increase physical activity (exercise management of diabetes); exercise has been utilized in the management of diabetes. Morehouse and Miller (1976) reported that exercise seems to potentate the hypoglycemia effect in insulin and the patient can maintain controlled carbohydrate metabolism with a smaller dose of

insulin. Such exercise includes bicycling, paddling, trekking and swimming. (iii) Reduction in alcohol intake and diet management, this involves learning good eating habit such as cutting down on fatty food and junks eating more of fish and poultry meat, reduction of salt intake to less than 5.8 grams daily and eating of more vegetables and fiber rich food.

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