

Screening, Knowledge and Management practices of Diabetes Mellitus and Hypertension in Amaoba Ikwuano Abia State Nigeria

Amadi ANC*, Amoke OC and Agbai PO

Department of Zoology and Environmental Biology, College of Natural Sciences, Michael Okpara University of Agriculture, Nigeria

*Corresponding author: Amadi ANC, Department of Zoology and Environmental Biology, College of Natural Sciences, Michael Okpara University of Agriculture, Nigeria, Tel: +2348036677444; E-mail: amadi.anthonia@mouau.edu.ng

Received date: January 24, 2018; Accepted date: February 13, 2018; Published date: February 15, 2018

Copyright: © 2018 Amadi ANC, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

Screening study of diabetes mellitus and hypertension was carried out in Amaoba Ikwuano Abia State Nigeria to determine the prevalence of diabetes mellitus and hypertension and to assess their knowledge, attitude and management practices of the diseases. Accu-check, glucometer strip, blood pressure monitor, weighing balance, height metre were used for the study. Out of 260 subjects, 136(52.30%) were males and 124(47.70%) were female. The overall prevalence of diabetes mellitus and hypertension was 35.38% and 32.31% respectively. The prevalence of diabetes mellitus in the study area indicated that males (41.3%) were more affected than females (29.03%). Also male are more hypertensive (38.25%) than females (28.81%). There is no significant difference with respect to sex ($p < 0.05$). Incidence of diabetes mellitus and hypertension showed that males within the age group of 61-70 years have the highest (38.89%) followed by females in the same age group (26.78%) and the least (2.94%) was among age group 20-30 years. There was a significant difference between age and sex ($p < 0.05$). Body Mass Index (BMI) according to sex in relation to diabetes mellitus and hypertension showed that majority of overweight males (67.85%) and females (65.38%) are diabetic and males (60.45%) and females (50.00%) and hypertension respectively are overweight. Questionnaire analysis showed that majority of respondents are aware of what diabetes mellitus is while most (62.03%). Most (64.62%) have not been previously diagnosed of diabetes mellitus. Knowledge on hypertension showed that most (96.15%) are aware of the disease and majorities (67.69%) have not been previously diagnosed of the disease. Some (31.62%) respondent believed that diabetes is caused by consumption of starchy food; others (39.26%) identified the cause of hypertension to be obesity. Management of diabetes mellitus were identified to be adhering to diet (29.31%). Whereas the management of hypertension were identified to be maintaining normal weight (33.57%) followed by routine check of blood pressure (26.93%). Majority (74.62%) of the respondents receive treatment of diabetes mellitus and hypertension in hospital and chemist. High blood pressure and diabetes mellitus are prevalent in the study area. There is need for urgent intervention by relevant agencies for proper health education in the communities for regular screening test and management practices to minimize or avert the risk of complications of late diagnosis.

Keywords: Screening; Prevalence; Diabetes mellitus; Hypertension; Management practices

Introduction

Diabetes mellitus (DM) and hypertension are global health disorders afflicting millions of people worldwide with an ever increasing incidence and prevalence [1]. Diabetes Mellitus occurs as a result of insufficient insulin production or because of the presence of factors that oppose the production of insulin [2]. It is a condition in which the patient blood sugar level is high either because insulin production is inadequate or the body cells do not respond properly to insulin or both. 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. The hormone is produced and released into the blood by an organ called "pancreas". This insulin helps to maintain the blood glucose level within a normal range. WHO puts the normal range between 60-100 mg/dl (before taking any food for the day, hence this value is called fasting blood glucose.

Diabetes mellitus is the fastest growing, long term diseases in terms of number that affects millions of people worldwide with many sufferers unaware they even have the disease. In Nigeria, an estimated number of over 3 million Nigerians between age 25 and 79 years have

diabetes, while 2.5 million Nigerians living with the condition, unaware and undiagnosed according to the World Health Organization standard [3].

The rate of hypertension in Nigeria has moved from 11-20% and now increasing to 40%. In Africa, more than 40-50% of adult in many countries were estimated to be hypertensive. This is bad because the condition can damage the heart, or the brain leading to stroke, heart failure, systemic or pulmonary failure due to the presence of combination of some risk factors such as: tobacco use, unhealthy diet and obesity, physical inactivity and harmful use of alcohol, diabetes mellitus and hypolipidaemia [4].

Diabetes mellitus may have various complications among which is diabetic nephropathy that could lead to kidney dysfunction, foot ulcer and diabetic retinopathy that could lead to total blindness if not properly managed [5]. In male, it may cause erectile dysfunction. It has been discovered that close to 60% of male with diabetes have erectile dysfunction [6]. Diabetes mellitus leads to a lot of infections as the ability to fight infection is weakened. Many factors may lead to high blood pressure, it may be a primary disease entity (in which case it is referred to as essential hypertension or symptoms of a number of disorders affecting the kidney that is reno-vascular hypertension or it may be due to disorder of the blood vessels or the adrenal glands. Such

infections include: typhoid fever, tonsillitis which may lead to hypertension. The normal average blood pressure in a young adult is 120/80 that is, 120 millimeters for the systolic blood pressure and 80 millimeter for the diastolic blood pressure. Persistent reading above 140 systolic and 90 diastolic blood pressures actually indicate the patient is hypertensive or have a high blood pressure [7].

Materials and Methods

The study was conducted in Amaoba in Ikwuano Local Government Area Umuahia in Abia State. The total population sampled was 260 from Amaoba. The subjects were investigated to evaluate the incidence of diabetes mellitus and hypertension in the study areas and to access their knowledge and management practices of the diseases.

The design adopted for this research is epidemiology survey. It tries to determine the incidence of diabetes mellitus using an accu-chek glucometer and the incidence of hypertension using a blood pressure monitor and their knowledge and management practices using questionnaires.

Other instruments used are Hanson bathroom scale weighing balance, height meter, soft clix lancet, cotton wool, methylated spirit.

Blood glucose measurement

Blood glucose level was measured using accu-chek glucometer by fasting blood sugar (FBS) method. An accu-chek glucometer with a measuring range 100-600 mg/dl (0.6-33.3 mmol/L). Accu-chek active test strip was inserted into the glucometer with the appropriate code chip and the glucometer automatically turned on. A cotton wool was used to apply methylated spirit on the individual's fingertip (usually the third finger) to sterilize the area. Soft clix lancing device was prepared for pricking the fingertip and a small drop of blood was applied on the middle of the green colored square on the test strip after a dropping sign was displayed on the glucometer. The glucometer measured and displayed the level of glucose in the individual's blood which was recorded. The values obtained were classified according to WHO standards. A result of 60-100 mg/dl shows normal sugar level, 100-120 shows pre-diabetes while 120 and above is diabetic according to WHO.

Sex	Frequency (N)	Prevalence & Percentage (%)
Diabetes Mellitus (DM) Male	136 (52.30%)	56(41.3)
Female	124 (47.70)	36 (29.03)
Total	260 (100)	92 (35.38)
Hypertension Male	136 (52.30)	52 (38.25)
Female	124 (47.70)	32 (28.81)
Total	260 (100)	84 (32.31)

Table 1: Overall prevalence of Diabetes Mellitus and Hypertension according to sex and location.

Blood pressure measurement

The air tube of the blood pressure monitor was connected to the central unit with the arm cuff wrapped round the individual's arm. Blood pressure were measured on the left arm and placed horizontally close to the heart with the arm horizontal on a table with the individual in a sitting position after resting for about 5-10 minutes. The central unit was turned on as the arm cuff begins to inflate and after 1-2 minutes, the systolic and diastolic blood pressure automatically display after deflation [8].

Weight measurement

The weight was measured with a weighing balance graduated in kilograms (kg) from 0-120 kg. The individual stand erects on the weighing balance without touching anything. The weight was read and recorded to the nearest 0.1 kg.

Height measurement

The height of the individual was measured with a height meter. Each individual stands on the platform with feet parallel to each other and with heels, shoulder and back touching the height meter. The head was held comfortably erect and arms hang at their sides in a natural manner. The height was read and recorded to the nearest 0.1 cm. Body Mass Index (BMI) was calculated as an index weight for height (kg/m²) and categorized according to WHO standards.

Statistical analysis

Data was computed statistically using chi-square and simple percentage, a P-value <0.05 was considered statistical significant whereas P>0.05 was considered insignificant.

Results

In Table 1, the overall prevalence of diabetes mellitus in male was 56 (41.30%), female 36 (29.01%) and hypertension was 52 (38.25%) in males 32 (28.81%) in females.

Age group	Male Frequency	Percent	Female Frequency	Percent
20-30	0	0.00	1	1.47
31-40	10	9.26	8	11.76
41-50	18	16.67	10	14.71
51-60	32	29.63	18	26.70
61-70	42	38.89	18	26.70
70+	6	5.56	13	16.18
Total	108	100	68	100

Table 2: Distribution of the incidence of Diabetes Mellitus and Hypertension in relation to age group and sex.

Table 2 represents the incidence of diabetes mellitus and hypertension in relation to age. Most males (38.89%) in the study area within the age group of 60 - 70 are affected. Followed by those within the age group of 51 – 60 (29. 63%) while no case was recorded within the age group 20 – 30. Amongst the females, those within the age group of 51-70 are mostly affected (26, 70%) and the least was within the age group of 20-30 years.

Occupational Status	Frequency (N)	Percent
Civil servant	90	34.61
Students	84	31.52
Farmers	14	5.43
Self-employed	28	10.86
Trader	46	17.39
Total	260	100

Table 3: Distribution of respondents based on occupational status.

In Table 3, the occupational status of the respondents shows that in the study area civil servant has the highest number (34.61%) followed by students (31.52%) then traders (17.39%), self-employed [9] then least is farmers (5.43%).

BMI Internal	Male		Female	
	No. of DM (%)	No. of HBP (%)	No. of DM (%)	No. of HBP (%)
18.5 – 25.0 kg/m ² Normal	10 (17.86)	10 (19.23)	8 (22.22)	8 (25.00)
25.0 – 29.0 kg/m ² Overweight	38 (67.85)	34 (65.38)	22 (61.11)	16 (50.00)
Above 30 kg/m ² Obsess	8 (14.29)	8 (15.38)	6 (16.67)	8 (25.00)
Total	56 (100)	32 (100)	36 (100)	32 (14.00)

Table 4: Incidence of Body Mass Index (BMI) in male and female with Diabetese Mellitus (DM) and Hypertension (HBP).

The incidence of Body Mass Index (BMI) according to sex in relation to diabetes mellitus and hypertension show that out of 56 males that are diabetic in the study area 8 (14.29%) are obsessed and 38 (67.85%) are overweight. Also out of 52 males that are hypertensive 34 (65.38%) are overweight and 8 (15.38%) are obsessed. Among the females, of the 36 that are diabetic, 22 (61.11%) are overweight and 6(16.67%) are obsessed, and also out of 32 that are hypertensive 8 (25.00%) are obsessed (Table 4). Respondents response on knowledge about diabetes mellitus and hypertension indicate that majority (92.31%) of subjects are aware of diabetes mellitus as a disease. Also majority (64.62%) have not been previously diagnosed of the diseases while most (96.15%) are aware of hypertension and only few (32.31%) have been diagnosed of disease (Table 5).

Variables	Frequency	Percentage
Diabetes Mellitus aware		
Yes	240	92.31
No	20	7.69
Total	260	100
Previously Diagnosed		
Yes	92	35.38
No	148	64.62
Total	260	100
Hypertension Aware		
Yes	250	96.15
No	10	3.85
Total	260	100
Previously Diagnosed		
Yes	84	32.31
No	176	67.69
Total	260	100

Table 5: Distribution of respondents on the knowledge of Diabetes Mellitus and Hypertension.

Causes	Frequency	Percent
Diabetes Mellitus	0	0.00
Witchcraft		
High consumption of sugar	72	27.90
Consumption of starchy food	82	31.62
Lack of exercise	22	8.37
Hereditary	36	13.95
High alcohol intake	18	6.51
Overweight	18	6.97
No idea	12	4.65
Total	260	100
Hypertension		
Obesity	102	39.26
Stress	88	33.78
Hereditary	40	15.06
Witchcraft	0	0.00
Too much salt intake	18	6.84
No idea	12	5.02
Total	260	100

Table 6: Distribution of respondents based on the causes of Diabetes Mellitus and Hypertension.

High consumption of starchy food was indicated to be the main cause of diabetes. Witchcraft was not seen as the cause of diabetes mellitus. On hypertension, respondents claimed that obesity is the main (39.26%) cause of hypertension, followed by stress (33.78%), hereditary (15.06%), too much salt intake while the least (5.02%) has no idea of the cause of hypertension (Table 6).

Signs and symptoms	Frequency	Percent
Diabetes Mellitus		
Frequent urination	160	61.53
Sugar ant around the urine	10	3.84
Weakness	80	30.76
No idea	10	3.84
Total	260	100
Hypertension		
Chest pain	80	30.68
Constant headache	38	14.81
Shortness of breath	96	37.03
Blurred vision	46	17.46
No idea	0	0.00
Total	260	100

Table 7: Distribution of respondents based on the signs and symptom of Diabetes Mellitus and Hypertension.

Frequent urination was observed to be the main symptom of diabetes mellitus (61.53%). Followed by weakness (30.76%). Shortness of breath (32.03%) was observed to be the main symptom of hypertension followed by chest pain (30.68%) other are blurred vision (17.46%) and constant headache (14.81%) in Table 7.

Table 8 indicates that, adhering to diet was observed to be the highest (29.31%) perceived management practices, followed by medication (26.89%), routine screening (25.86%), exercise (17.93%) then No idea (3.44%) majority (56.66%) of them had no idea about the management practices, followed by adhering to diet (20.66%), routine screening (13.33%) proper medication (6.66%) then exercise (2,66%). Management practices of hypertension among the respondents reveal that majority (33.57%) agreed that maintaining normal weight is very important in maintaining normal blood pressure followed by routine check of blood pressure (26.93%) then adhering to medication (18.81%).

The method of treatment of both diseases are observed by majority (74.62%) of the respondents and agreed that they are best treated in the hospital, followed by Herbal treatment (19.23%), chemist (3.85%) and self-medication (2.31%) (Table 9).

Management practices	Frequency	Percent
Diabetes mellitus		
Exercise	44	17.93
Medication	68	26.89
Routine screening	64	25.86
Adhering to diet	76	29.31
No idea	8	3.44
Total	260	100
Hypertension		
Controlled salt intake	42	15.86
Maintaining weight at normal	88	33.57
Routine check of blood pressure	70	26.93
Adhering to medication	48	18.81
No idea	12	4.79
Total	260	100

Table 8: Distribution of respondents based on the management of Diabetes Mellitus and Hypertension.

Method of treatment	Frequency (N)	Percent
Chemist	10	3.85
Hospital	194	74.62
Herbal	50	19.23
Self-medication	6	2.31
No idea	0	0.00
Total	260	100

Table 9: Distribution of respondents based on the method of treatment of Diabetes Mellitus and Hypertension.

Discussion

This study showed that more males (41.30%), are diabetic than females (29.03%). This disagrees with the study of Ngwu and Nwabueze [10] who observed that females are more affected. The observation from this study could be attributed to the fact that men tend to distribute fat more readily around the liver or other body organs unlike the women who deposit fat under the skin and the hip. Also alcohol intake and dietary habit can influence the way the gain weight and can equally make them insensitive to insulin [11].

It was also observed that more males (38.25%) are hypertensive than the females (28.81%). This could be as a result of too much economic hardship and stress encountered by the males in trying to take care of the family.

Subjects having hypertension are likely to have diabetes mellitus from this study, this is in agreement with Bernoho et al. [12] who

noted that there is considerable evidence from an increase in prevalence of hypertension in diabetic persons and vice-versa.

Incidence of diabetes mellitus and hypertension according to age in the study areas showed that males within the age group of 61 – 70 years have the highest (38.89%), followed by female(26.70%) in the same age group. This could be because the disease is a degenerative disease and progresses with age. The least (2.94%) is among age group 20-30 years in both study areas. Ngwu et al., [9] also observed that prevalence of diabetes increasing with age and as people age their relative amount of body fat tends to increase even if their weight stays stable and muscle mass tend to increase [3]. This makes the aged more predisposed to diabetes mellitus. Akinkugbe [13] and Henry Unaeze et al., [14] noted that the risk of diabetes mellitus increases 3 -4 folds after the age of 44 years in Nigeria.

The high prevalence of overweight and obesity are risk factors to diabetes among the study population could trigger diabetes in future. Since overweight and obesity are risk factors to diabetes and sedentary life style of most adults promotes over weight and obesity which triggers hypertension [14]. Most diabetes and hypertensive patients are unaware of their health status and have not subjected thousands to screening test. This is in agreement with Ugwu et al., [9] and Amadi and Nwokolo [15] they observed that most diabetic and hypertensive patients are only aware of their status until they reach complication stage. Early detection of diabetes may change the course of the disease and early intervention can lead to delay in progression to complication Whitney and Rolfes [3], observed that diabetes mellitus and hypertension cause prolong ill-health, impose morbidity and mortality risks, necessitates a change in life style with a meticulous daily routine and long term self-care [9]. High consumption of starchy food was indicated by the respondents to be the main cause of diabetes.

Majority (39.26%) of the respondents believe that hypertension is caused by obesity. Most respondents attributed the causes of diabetes mellitus to be consumption of starchy food. Although, Kazeem [2] observed that diabetes has no clear cut causes. The respondents believe that obesity is the cause of hypertension this agrees with the signs and symptoms observed by Oyekole [7] which include; shortness of breath, obesity, constant headache.

Most respondents attributed frequent urination as most significant signs and symptoms of diabetes mellitus others include excessive thirst, blurred vision, while the symptoms of hypertension in the urban area is believed to be shortness of breath, this agrees with Oyekole [7] who observes that obesity, chest pain shortness of breath are some of the signs of hypertension.

A good number of respondents had the knowledge of diabetes mellitus as majority of them have been previously diagnosed of the disease.

Most respondents believed that adhering to prescribed diet was the best management procedure for diabetes mellitus. This is in agreement with Kazeem [2] who pointed out that dietary management of diabetes mellitus. They also believe that maintaining normal weight is the most significant to the management of hypertension.

It was observed in the study that diabetes mellitus and hypertension are co-disease that occurs at the same time in most patients. This result is in agreement with Epstein and Sower [16] who observed that diabetes mellitus and hypertension are common diseases that co-exist at a greater frequency than chance alone would predict. There is a weak positive relationship existing between the number of males and

females with diabetes mellitus and hypertension according to age indicating that age is an insignificant contribution to the number of males and females affected with diabetes mellitus and hypertension [17]. Smith [18] observed that diabetes affects all ages of our population, Saduwa et al., [3] have identified juvenile onset (insulin dependent) diabetes as the type that affects the adult onset (Non-insulin dependent) diabetes as the type that affects the elderly.

Observations from this study show that diabetes mellitus and hypertension are co-ailments that affect both male and female who are equally exposed to the same risk factor though more males than females are affected also increase with age and mostly found more among the elderly, overweight and obsessed. There is therefore the need for intervention of the government and relevant stakeholders to make legislations that encourage local farming and production of fruits and vegetables to make them easily available this will make for less dependence on high consumption of starchy food for the benefit of all, make screening kits available in all health centers and also there should be national campaign on radio and other mass media to educate the populace on regular screening of diabetes mellitus and hypertension for early dictation and proper management [19].

References

1. World Health Organization (2012) New highlight on increase of hypertension, diabetes mellitus. *Geneva Health Statistics* 844: 24-30.
2. Ngwu EK, Nwabueze AM (2008) Prevalence and presentation of diabetes mellitus among patients attending University of Nigeria Nsukka Medical Centre. *Nigerian J Nutr Sci* 29: 216-231.
3. Whiteney EN, Whiteney E, Rolfes SR (2008) Hypertension. In: *Understanding nutrition* (11th Edn). Thompson Wadsworth, Belmont U.S.A, pp: 632 -636.
4. <http://www.thenationsonlinenewspaper.com>
5. Epstein M, Sower JR (1992) Diabetes mellitus and hypertension: a co-disease. *American Heart Association* 19: 403-418.
6. www.sunnewsonline.com.
7. Smith IF (1994) Current trends in the management of diabetes. *Nigeria J Nutr Sci* 5: 76-86.
8. Abdollahi AA, Qorbani M, Salehi A, Mansourian M (2009) ABO blood groups distribution and cardiovascular major risk factors in healthy population. *Iran J Public Health* 38: 123-126.
9. <http://www.thenationsonlinenews.com>.
10. Ngwu EK, Nwabueze AM, David U (2012) Diabetes screening: a case study of Nsukka urban Enugu State. *J Diet Assoc Nigeria* 3: 51-60.
11. Boussageon R, Bejan AT, Saadatian- Elahi M, Lafont S, Bergeonneau C, et al. (2011) Effect of intensive glucose lowering treatment on all cause mortality, cardiovascular death, and microvascular events in type 2 diabetes: meta-analysis of randomised controlled trials. *BMJ* 343: d4169.
12. Akinkugbe OO (1997) Non-communicable disease in Nigeria. Final report of National Survey, Lagos: Federal Ministry of Health-National Expert Committee on NCDs, pp: 64 -90.
13. Logue J, Walker J, Colhoun HM, Leese GP, Lindsay RS, et al. (2011) Do men develop type 2 diabetes mellitus at lower body mass indices than women? *Diabetologia* 54: 3003-3006.
14. Amadi ANC, Nwokolo I U (2014) Biological Screening, knowledge and Management of diabetes mellitus in Obohia Ahiazu, Mbaize Imo State, Nigeria. *Animal Res Int* 11: 2057-2062.
15. Henry-Unaeze HN, Ngwu EK, Allison CC (2012) Hospital attendance and prevalence of diabetes mellitus and hypertension among adult traders in Aba, Abia State. *J Diet Assoc Nigeria* 3: 63.
16. Berraho M, El Y, Benslimane K, Rhazi M, Chikri M, et al. (2012) Hypertension and type 2 diabetes: a cross sectional study in Morocco. *Pan Afr Med J* 11: 52.

17. Wokoma FS (2001) Gestational diabetes mellitus in a Nigeria antenatal population and associated diseases. *Trop J Obstet Gynaecol* 18: 56-60.
18. Kazeem A (2005) What you need to know about diabetes care. *Diabetes Care* 2: 2-5.
19. World Health Organization (1999) Development of non-communicable disease: surveillance, definition, diagnosis and classification of diabetes mellitus and its complications. Geneva WHO Report, pp: 342-346.