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Original Research Article

Prevalence of diabetes mellitus among adults treated in Imo State University teaching hospital Orlu local government area, Imo State, Owerri, Nigeria

Ezeama Martina C.[1], Enwereji Ezinna E.[2]*

[1]Department of Nursing Sciences, Imo State University, Owerri, Nigeria
[2]Department of Public Health, Abia State Universitym, Uturu, Nigeria

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***Correspondence:**
Dr. Enwereji Ezinna E.,
E-mail: hersng@yahoo.com

ABSTRACT

Background: Type 2 diabetes is the result of complex interplay between genetic and environmental factors. Diabetes epidemic is largely due to unhealthy diet and lifestyles. Dietary composition affects both its development and complications because fatty acids influence glucose metabolism by altering cell membrane function, enzyme activity, insulin signalling, and gene expression. Therefore, replacing saturated fats and trans-fatty acids with unsaturated fats has beneficial effects on insulin sensitivity and in reducing the risks of type 2 diabetes. Research has shown that if people with diabetes, together with the health care workers manage diabetes well, that the risk of complications will be greatly reduced or prevented or delayed. This study focused on assessing the prevalence and causes of type 2 diabetes, types of complications patients presented, and the likely preventive interventions given to them in University Teaching Hospital Orlu.
Methods: A retrospective study that carried out extensive review of hospital records of adults admitted and treated for type 2 diabetes mellitus from 2015 to 2017 in University Teaching Hospital was done. The review of the adult patients' records lasted for three working weeks. In the review, summaries of causes of diabetes, types of complications and preventive measures health workers provided to the patients were documented.
Results: Finding showed that 79 adults made up of 43(54.4%) males and 36(45.6%) female between 41-77 years were admitted and treated for various causes of type 2 diabetes between 2015 and 2017. Most of the patients treated were civil and public servants. The main cause of diabetes mellitus 51(65%) among the patients studied was physical inactivity due to sedentary work. The common complications presented were hypertension, diabetic ulcer, depression and obesity. Health talks and group counselling were the interventions provided. These interventions concentrated on types of healthy dietary intakes and lifestyles the patients should adopt.
Conclusions: Regular and sustained health care services that would emphasize healthy diet and lifestyle modifications to reduce the risk factors of type 2 diabetes mellitus should be provided to all patients treated in this hospital. Therefore, obese diabetic patients should be encouraged to engage in physical exercises so as to maintain healthy body weight which is a cornerstone for prevention of type 2 diabetes mellitus.

Keywords: Adiposity, Diabetes, Intervention, Lifestyles, Nutrition, Unsaturated fats

INTRODUCTION

There is increasing evidence that the quality of fats and carbohydrates consumed by individuals will play more important role in the protection against diabetes mellitus than the quantity consumed.[1] Researchers recommend the

use of public health strategies to highlight the risk factors of diabetes mellitus. The idea is to emphasize to individuals the need to replace saturated fats with unsaturated fats and also replacing refined grain products with whole grains.[2,3] Studies have observed the positive roles of coffee, dairy, nuts, magnesium, and calcium in preventing diabetes.[4] The finding is that a diet that includes these nutrients with regular physical activity, healthy weight, moderate alcohol consumption and smoking, would nearly eliminate type 2 diabetes.[5,7] However, the problem is the wide gap between what is known and what is practiced. How to narrow this gap remains a major public health challenge in a developing country like Nigeria. More studies have recommended that taking foods rich in vegetable oils, including non-hydrogenated margarines, nuts, and seeds will positively reduce diabetes mellitus.[8,9] Also recommended is the reduction in the consumption of saturated fats from meats, fat-rich dairy products and partially hydrogenated fats to minimize diabetes mellitus.[10,11] Compelling evidences from metabolic studies, prospective observational studies, and clinical trials implicate unhealthy diets, obesity, and sedentary lifestyles as the major contributors of diabetes epidemic.[12,13] Obesity was regarded as strongest risk factor for diabetes mellitus. Maintaining a healthy weight by avoiding overconsumption of energy foods is, therefore, a clear key to diabetes prevention.[14,15]

There are advantages in understanding the risk factors of diabetes mellitus. However, the fact that there is still a wide gap between what is known and what is practiced in the field of public health suggests the need to narrow this gap. Evidence has shown that controlling obesity will help in the prevention of type 2 diabetes mellitus.[16-18] Therefore, measures aimed at reducing or preventing overweight and obesity are particularly relevant in controlling the risk of diabetes mellitus. Lifestyle modifications to balance energy intake and expenditure, making healthy food and lifestyle choices are helpful in preventing diabetes mellitus at individual level.[19,20] Among the polyunsaturated fats, linoleic acid from n-6 series that improves insulin sensitivity is essential in the prevention of diabetes mellitus.[21,22] There is need for health workers to communicate such information to the public by translating them into practice. Even communicating the need to engage in activities like regular walking, maintaining healthy body weight, minimizing sedentary behaviors like TV watching will offer substantial benefits in the reduction of type 2 diabetes mellitus.[23,24] Therefore, the information on healthy diet, regular physical activity, healthy body weight, consumption of moderate amounts of alcohol, and avoiding the habit of smoking should regularly be provided to individuals so as to prevent type 2 diabetes cases.[25-27]

Diabetes Mellitus (DM) was previously considered to be rare in sub-Saharan Africa including Nigeria. Studies have noted that the prevalence of diabetes mellitus is on the increase among those living in the urban areas who have made changes in lifestyles and diet. The current prevalence of diabetes mellitus in Nigeria is not known. The estimate is in the region of 8%-10% for the three classes of diabetes mellitus that are recognized in the setting. These are type 1 diabetes mellitus (T1Dm) in which the prevalence is not known. Secondly type 2 diabetes mellitus (T2Dm) which its prevalence rate is relatively high. Thirdly is gestational diabetes with prevalence of 2.98 per 1000 pregnancies. Further, the prevalence of type 2 diabetes increases with maternal age. It is 3.3% in the age group or I5 to 24 years, 4.2% for those 25 to 34 years, 17.6% in the age group of 34 to 44 years and an average prevalence of 30.2% for those 45 to 65 years.[28]

The prevalence of type 2 diabetes has been found to increase as a result of faulty lifestyle.[29] Many individuals from developing countries have now changed their nutrition to that of the developing countries which are marked by excess intakes of nutrient-poor foods with high energy density.[30] This calls for coordinated preventive interventions to reduce the prevalence of diabetes.[31] The extent to which consumption of sugar and saturated fats referred to as western pattern of diet, and sedentary lifestyles are practiced in developing countries should be addressed so as to change the trend.[32,33]

The problem is that the number of people with diabetes mellitus has now increased both in developing and developed countries. Diabetes mellitus is now regarded as the ninth leading cause of death. Studies have shown that yearly, at least Studies have shown that yearly, at least eleven adults worldwide will have diabetes mellitus, and 90% of them is type 2 diabetes mellitus.[34,35] This epidemiological transition has increased the public health importance in the prevention of diabetes mellitus making it to deserve much more than just an interest. There is need for developing countries like Nigeria to generate enough data on burden of the disease so as to have effective interventions that will reduce diabetes-related complications, morbidity and mortality.[36,37] The issue with diabetes is that most cases of diabetes mellitus especially in the rural and suburban areas remain undiagnosed, and as such, a good number of them seek health care services late with multiple complications.[38] The aim of this study was to assess the prevalence of type 2 diabetes mellitus, common complications patients present on admission, and the health care services available to the patients. in the University Teaching Hospital, Orlu. This was necessary because type 2 diabetes mellitus has the potential to cause serious complications due to its insidious and chronic nature.

METHODS

This study was a retrospective study that undertook extensive review of patients' records in the medical records Department of the Imo State University Teaching Hospital Orlu Before the review of the patients' hospital

records, the researchers paid advocacy visit to the chief medical director to intimate him on the objectives of the research and also seek his approval to review the patients' medical records. Following his approval, the director of medical records was requested to make the patients' records available to the researchers. Thereafter, the records of adult patients from 40 years and above who were treated for diabetes mellitus between the year 2015 to 2017 were reviewed. This means that patients who were not treated for diabetes mellitus were excluded from the review. The researchers, therefore, reviewed the patients' records for both men and women who were 40 years and above. The review of the patients' records lasted for three working weeks.

Data were collected from the patients' records using questionnaire. The questionnaire which consisted of open and closed-ended questions was used by the researchers to collect patients' demographic information, causes of diabetes, complications presented as well as the types of health care services health workers provided to the patients to minimize diabetes and its complications. Data collected were analysed using frequency tables and percentages.

Approval for the study was obtained from the Ethical Review Committee of Imo State University Teaching Hospital before the study was started. Confidentiality was strictly maintained during the study.

RESULTS

The finding showed that from 2015 to 2017 when the study was conducted, that a total number 79 patients made up of 43(54%) males and 36(46%) females were admitted and treated for diabetes mellitus. The age ranges of the patients treated for diabetes mellitus were between 41 to 77 years. Table 1 contains the ages of the patients.

Table 1: Years of admission and age range of patients treated for diabetes mellitus.

Years of admission	Age range	Frequency	Percentage
2015	45-65 years	21	27%
	66-77 years	15	19%
2016	42-64 years	8	10%
	65 72 years	10	13%
2017	41-64 years	13	16%
	65-70 years	12	15%
Total		79	100%

From the data in Table 1, it can be observed that in 2015, more patients in the age range of 45-65 years were treated for diabetes mellitus while in 2016 more patients in the age range of 65-72 years were treated than others respectively. In 2017, there appears to be little or no difference in the number of patients treated for diabetes.

Table 2: Occupation of the patients.

Years of admission	Occupation	Frequency
2015	Civil service	13(36%)
	Public service	8(22%)
	Artisan	5(14,%)
	Farming	4(11%)
	Trading	6(17%)
Total		36(100%)
2016	Civil service	8(44%)
	Public service	5(28%)
	Artisan	2(11%)
	Farming	1(6%)
	Trading	2(11%)
Total		18(100)
2017	Civil service	10(40%)
	Public service	7(28%)
	Artisan	3(12%)
	Farming	1(4%)
	Trading	4(16%)
Total		25(100%)

Table 3: Causes of type 2 diabetes among the patients studied.

Years of admission	Causes of diabetes	Frequency
2015	Family history	6(17%)
	Physical inactivity	9(30%)
	Insulin resistance	5(14%)
	Overweight	6(17%)
	Obesity	4(11%)
	Abnormal cholesterol and triglyceride levels	4(11%)
	Polycystic ovary syndrome	2(6%)
Total		36(100%)
2016	Family history	2(11%)
	Physical inactivity	8(44%)
	Insulin resistance	2(11%)
	Overweight	1(6%)
	Obesity	2(11%)
	Abnormal cholesterol and triglyceride levels	3(17%)
	Polycystic ovary syndrome	0%
Total		18(100%)
2017	Family history	0%
	Physical inactivity	7(28%)
	Insulin resistance	3(12%)
	Overweight	4(16%)
	Obesity	4(16%)
	Abnormal cholesterol and triglyceride levels	5(20%)
	Polycystic ovary syndrome	2(8%)
Total		25(100%)

From this table, it can be deduced that the age range of patients treated for diabetes in 2015 were older when compared to the age ranges of those treated in other years, On the whole, greater number of patients 36(46%) were treated in 2015 than in other years. The occupations of the patients were assessed. These are contained in table 2.

Table 4: Complications patients were treated for while on admission.

Years of admission	Complications presented and treated	Frequency
2015	Hypertension	7(23%)
	Nerve damage (neuropathy)	1(3%)
	Kidney damage (nephropathy)	2(7%)
	Eye damage (retinopathy)	1(3%)
	Polyuria	5(17%)
	Polydipsia and weight loss	4(13%)
	Stroke	2(7%)
	Atherosclerosis	0%
	Chronic ulcers	3(10%)
	Sexual dysfunction	3(10%)
	Depression	2(7%)
Total		30(100%)
2016	Hypertension	4(21%)
	Nerve damage (neuropathy)	1(5%)
	Kidney damage (nephropathy)	1(5%)
	Eye damage (retinopathy)	2(11%)
	Polyuria	0%
	Polydipsia and weight loss	3(16%)
	Stroke	3(16%)
	Atherosclerosis	1(5%)
	Chronic ulcers	2(11%)
	Sexual dysfunction	2(11%)
	Depression	0%
Total		19(100%)
2017	Hypertension	6(21%)
	Nerve damage (neuropathy)	2(7%)
	Kidney damage (nephropathy)	2(7%)
	Eye damage (retinopathy)	0%
	Polyuria	4(14%)
	Polydipsia and weight loss	4(14%)
	Stroke	3(10%)
	Atherosclerosis	0%
	Chronic ulcers	4(14%)
	Sexual dysfunction	3(10%)
	Depression	1(3%)
Total		29(100%)

Table 2 shows that in each year, the occupation of a greater number of the patients treated was civil service. In 2015, out of 36 patients treated for type 2 diabetes mellitus, 13(36%) of them were civil servants. In 2016, out of 18 patients treated, 8(44%) of them were civil servants, while in 2017, out of 25 patients treated, 10(40%) of them were civil servants. The likely recorded causes of diabetes among the patients studied were assessed. Table 3 contains the information.

From table 3, there were several causes of type 2 diabetes mellitus as documented in the patients' records reviewed. The commonest cause of diabetes among the patients studied was physical inactivity. In 2015 physical inactivity was responsible for 9(30%) of all the diabetic patients treated. In 2016 physical inactivity caused 8(44%) of diabetes among those treated while in 2017 physical inactivity was responsible for 7(28%) of the cases. The complications the patients presented while on treatment were explored. Table 4 presents the complications as documented in the patients' records.

Table 5: Types of health care services patients received from health workers during admission.

Types of services	Themes	Contents of the services
Health talks	Making changes in lifestyle behaviours	Maintaining a BMI below 25
Group counseling	Reducing risk of complications	Reducing intake of high-GL foods
	Slowing down the progression of type 2 diabetes	Avoiding overweight
		Eating small portions of food
		Remaining physically active
		Keeping healthy blood glucose level
		Consume bulk calories by mid afternoon

Result contained in Table 4 showed that the patients were treated for several complications but a good number of them were treated for hypertension more than other complications. In 2015, 7(23%) of complications treated was hypertension while in 2016, it was 4(21%). In 2017, 6(21%) of the complications treated was also hypertension.

Types of health care services the patients received to enable them to minimize further complications were assessed. Table 5 contains details of services the patients received.

From table 5, the patients received two types of health care services with three themes as contained in Table5. The services they received were health talks and group counseling. The themes were "making changes in lifestyle behaviors", " reducing risk of complications" and "slowing down the progression of type 2 diabetes". The contents of the health services are shown in table 5.

DISCUSSION

The findings of the study showed that within the three years the study concentrated on , that a total number of 79 patients made up of 43(54%) males and 36(46%) female who were within the age range of 41 to 77 years were admitted and treated for diabetes mellitus. This is shown in table1. During the study, the year 2015, recorded a greater number of patients 36(46%) that were treated for diabetes mellitus than in other years. In 2016, there was a drop 18(23%) in the number of patients treated while in 2017, the patients treated increased to 25(31%). The drop in number of patients treated in 2016 may be attributed to the positive effects of health care services the health workers provided to the patients which centered on strategies to reduce the progression of type 2 diabetes mellitus and the complications as contained in Table 2. It is likely that the decrease in the number of patients treated may be attributed to the extent to which the patients adhered to the health care services they received. Also the sudden increase in the number of patients treated in 2017 may have been caused by the utter neglect of the patients in adhering to the health care services they received from the health workers. The health workers during health care services stressed on reducing one weight. They emphasized maintaining BMI not greater than 25 kg/m^2 at all times. The health workers' health care services also encouraged consuming healthy foods by reducing intake of sugar and sugar substitutes, as well as processed grains. Intakes of heart-healthy fats, high protein-whole grains that are capable of reducing further complications were encouraged. The benefits of health talks in the control of diabetes mellitus type 2 have also been emphasized by.[9,11,13]

The main occupations of the patients studied were civil service and public service as contained in table 2. The fact that majority of the patients were working as civil and public servants may be the reason why physical inactivity was identified as the main cause of type 2 diabetes among the patients treated. Inactivity is risk factor for diabetes mellitus.[2,5] The fact that a good number of the patients were working as civil and public servants may be why the main complication presented by the patients was hypertension. Sedentary work, which is inherent in civil service, is a risk factor for hypertension.[10,15] The patients however, presented with several complications as contained in Table 4, showing that the patients might have sought medical intervention at the advanced stage of their health conditions. The finding that patients seek medical intervention at advanced stages of their health conditions supports the views of.[14,19,21] These authors noted that diabetic patients in developing countries including Nigeria present with multiple complications at advanced stages as a result of poor health seeking behaviour.

The findings of the study in table 5 showed that the patients while on admission, received two types of health care services, health talks and group counseling with three specific themes that could assist patients in controlling complications of type 2 diabetes mellitus. The services contained instructions that emphasized adoption of healthy lifestyles as the panacea to reduce type 2 diabetes and its complications. The fact that the patients studied received health talks and group counseling showed the extent to which health workers were fully committed to the role of reducing the prevalence of diabetes mellitus and its complications in the society. This finding is in agreement with that of which confirmed positive roles of health workers in the prevention of type 2 diabetes mellitus.[8,11] Based on the findings of the study where there was remarkable decrease in the number of type 2 diabetic patients in 2016 after the health care services in 2015, it is recommended that regular health talks and group counseling that help to educate patients on healthy lifestyle practices should be sustained for diabetic patients in the hospital. This will help to minimize the prevalence of type 2 diabetes mellitus in Imo State.

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