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Body mass index and concurrent infection in type 2 diabetes mellitus adults in rivers state Nigeria

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Abstract
Diabetes mellitus is a disorder of carbohydrate metabolism characterized by high blood sugar level (hyperglycemia) and high level of sugar in urine (glycosuria). The study assessed the prevalence of concurrent infection amongst diabetic patients in Rivers State using university of Port Harcourt Teaching Hospital (UPTH). A total of 150 patients (50% male and 50% female), attending the diabetic clinic at University of Port Harcourt Teaching Hospital, Rivers State, South-south Nigeria, between January 2018 and June 2018. These patients had been visiting the clinic for medical treatment and dietary counseling for at least six months prior to the study. Anthropometric measurement were taken. Body mass index (BMI) was also calculated. Questionnaires were used to obtain information on the socio-economic profiles of the patients. The SPSS (statistical Package for Social Science) version 17 was used for data analysis. The results showed that 16% were blind, 4% had kidney disease, 16% had stroke, 2% had heart disease, 48% had blurred vision, 4% had their limbs amputated and 35% were depressed among the male diabetics while the female had blindness 14%, stroke 12%, Blurred vision 36% and depression 26%. And 28% of the Participant where over weight while 51% were obese, which might lead to heart diseases. About 20% of the diabetics where engage in physical activity. In conclusion, the study observed high prevalence of concurrent infection among the participant and high prevalence of obesity.

Keywords: type ii diabetes, prevalence, risk factors, concurrent infection, hypergly cemia

Introduction

Diabetes mellitus, a discrete disorder manifested clinically by elevated blood glucose level in the blood. It is a major health problem and also considered as one of the largest emerging threat to health in the 21st century (WHO, 1998) [10]. It is a metablic disorder in which the blood sugar level has been high over a prolonged period of time due to deficiency of insulin secretion.

Diabetes places a high burden of illness on people with diabetes in the age group of 46-60 years are 23 times more likely to be registered blind than their non-diabetes counterparts (Ogbonnayal, 2015; Wordu and Oleri, 2017) [11].

Its prevalence has been observed to be increasing in the last decades; this is due to the changes in life styles of countries, especially the developing ones. It has been projected that by 2035, Africa should have the largest proportional increase in the number of adults with diabetes (Guariguatal, *et al*, 2014).

Insulin is the principal hormone that regulates the uptake of glucose from the blood of most cells of the body. A deficiency or insensitivity of insulin plays a central role in all forms of diabetes mellitus.

Insulin deficiency also leads to overweight in individuals because it also affects the metabolism of fats and protein leading to obesity in diabetes patients. Obesity exposes individual to hypertension. Hypertension worsens the prognosis of diabetic patients by increasing the cardiovascular risk and chronic complications (Guenou *et al*, 2015) [4].

Having diabetes increases the risk of developing high blood pressure and other cardiovascular problems, because diabetes adversely affects the arteries, predisposing them to atherosclerosis. Atherosclerosis can lead to further blood vessel damage and stroke, heart failure, heart attack and kidney failure.

Diabetes has been observed to be increasing in the last decade, this is due to the ignorance of the massive consumption of foods containing simple sugars, such as snacks, soft drinks, etc.

The mortality rate from diabetes is very high compared with cancers and other diseases. In developing countries where diagnostic materials are not readily available, most patient die without knowing that they have diabetes as to seek medical treatment. Up to 20% prevalence was recorded of the adult population in most developing countries (IDF, 1994) [5]. Most cases of all limbs amputation are due to diabetes, and blindness in middle age are caused by diabetes.

The prevalence of the concurrent infections has not been fully documented in Rivers State Nigeria. This study is aimed to determine the prevalence of concurrent infections among diabetes mellitus patient in Port Harcourt, Rivers State, Nigeria.

Materials and Methods

A retrospective study of the pattern of infections that often complicates diabetes mellitus was done in University of Port Harcourt, Teaching Hospital, Port Harcourt. A total of 150 cases of both admitted and out-patient cases were included in the study. A structured interview administered questionnaire was development and used to collect data on their socio-economic status and their life style characteristics. Information on their anthropometric indices and the concurrent infections associate with their diabetes status.

Data Processing and Analysis

The data was entered into the computer for analysis using statistical package for Social Sciences (SPSS) Software, version 17.0. The data generated were subjected to descriptive statistics such as (means, standard deviations, percentages and frequencies).

Results

The socio-demographic profile of the diabetic patients of University of Port Harcourt Teaching Hospital, Rivers State Nigeria is presented in Table 1. It shows that respondents who were 20 -40 years of age were 8% while those were 41-60 years of age were 50%, while those who were 61-90 years of age were 42%. Among the respondents were 50% male and 50% females. About 10% were single while 74% were married and 16% were widow or widower.

Table 1: Socio-Demographic Characteristics of the Respondent.s

Variables	Frequency	Percentage (%)
Ages		
20 – 40	12	8
41 – 60	75	50
61 and above	63	42
Total	150	100
Gender		
Male	75	50
Female	75	50
Total	150	100
Martial status		
Married	111	74
Single	15	10
Widow/widower	24	16
Divorced	0	0
Total	150	150
Education		
Non-formal	36	24
Secondary	57	38
Tertiary	57	38
Total	150	100
Occupation		
Civil servant	36	24
Farmer	24	16
Business	90	60
Total	150	100

The frequency of exercise of the respondent is presented in figure 1. It revealed that 20% engaged in a form of exercise daily, while 80% do not engage in any exercise

The life style characteristics of the respondents is indicated in Table 2

Table 2: Lifestyle of the respondent

Variables	Frequency	Percentage (%)
Cigarette smoking		
smoke	27	18
No smoke	123	82
Total	150	100
Snuff usage		
Yes	21	14
No	129	86
Total	150	100
Alcohol consumption		
Yes	36	24
No	114	76
Total	150	100
Exercise		
Do exercise	30	20
Don't exercise	120	80
Total	150	100

Table 3: shows nutritional status of the respondents using body mass index (BMI). More than one quarter (28%) of the respondents were overweight while 51% were obese.

Table 3: Nutritional status of the respondents using body mass index

Variables		Frequency	Percentage (%)
	18.5kg/m^2	12	8.0
Normal	18.5 – 24kg/m^2	19	12.0
Overweight	25.0 – 29.9kg/m^2	42	28.0
Obese	30.0 up kg/m^2	77	51.0
Total		150	100

Table 4: Shows the prevalence of concurrent infection among the male diabetes. Forty-two percent had blurred vision, while 35% were depressed. Heart disease was recorded the least with 0%.

Table 4: The prevalence of diabetes infection among the male subjects

Variables	Percentage (%)
Blindness	16.0
Kidney disease	4.0
Stroke	16.0
Heart disease	0.0
Blurred vision	42.0
Amputated limbs	4.0
Depression	35.0
Bacterial infection	26.0
Anxiety	20.0
Glycosuric	24.0
Hyperglycemic	30.0
Neuropathy	4.0

Table 5, shows the prevalence of concurrent infections among the female subjects in the study. The study showed that blurred vision was highest (36.0%) followed by anxiety (28.0%). The kidney disease was ranked last among the female participant.

Table 5: The Prevalence of Diabetes infections among female subjects.

Variables	Percentage (%)
Blindness	14.0
Kidney disease	0.0
Stroke	12.0
Heart disease	2.0
Blurred vision	36.0
Amputated limbs	4.0
Depression	26.0
Bacterial infection	18.0
Anxiety	28.0
Glycosuria	16.0
Hyperglycemic	26.0
Neuropathy	16.0

Discussion

The study sought to assess the prevalence of concurrent infection on type 2 diabetes subjects in Rivers State hospital. The study showed that 96.4% of the subjects were either overweight or obese. Similar result was obtained by Osuntokun, *et al*., (1971) [7], Gezawa *et al*., (2013) [2], also found high rate of obesity among the subjects they studied.

Sabir *et al*, (2017) [9] also found high prevalence of concurrent infection in diabetes among men and women in

their study which agrees with findings of this study.
Their life style characteristic indicated that only 20% of them participate in one sort of physical activity or the other. This predisposes the obese subjects to increased risk of metabolic syndrome and other chronic inflammatory disease such as blindness, blurred vision and europathy consumption alcohol, high in simple starch could lead to deposition of dietary fat in the fat stores of the adipose tissues and thus increase the chances of an individual getting overweight or obese. Numerous studies reported that 25-65% of diabetes patients were physical inactive (Puepet and Ohwavoride 20008 and Ekpenyong, *et al*., 2012).
The increased BMI, body fats, coloric intake and sedentary lifestyle all play significant roles in the development of obesity, in turn diabetes seen in the study population. The result of this study showed high, prevalence of concurrent infection among the diabetes patients.

Conclusion
This study has revealed that high prevalence of concurrent infection in diabetes among the patients in the Univeristy of Port Harcourt Teaching Hospital, Rivers State.
There is the need for nutrition education programmes to sensitize obese patients on appropriate dietary and healthy lifestyles, based on the finding of this study.

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