

Assessment of Prevalence of Obesity among Newly Diagnosed Type 2 Diabetic Patients in Diabetic Out Patient Clinic, of University of Nigeria Teaching Hospital (UNTH), Ituku/Ozalla, Enugu State, Nigeria

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Abstract

Introduction: Assessment of prevalence of obesity among newly diagnosed type 2 diabetic patients in diabetic outpatient clinic, UNTH, Ituku/Ozalla was carried out. This research aimed to ascertain the impact of obesity in the development of diabetes mellitus and to know the prevalence of obesity in both gender. **Methodology:** The study was conducted in Wednesday Diabetic out-patient clinic University of Nigeria Teaching Hospital Ituku/Ozalla. A total number of 211 patients were used: 102 males and 109 females. The patients were all adults. Data was collected using anthropometric measurement ranging from weight and height measurement, waist and hip circumference. BMI and waist-hip ratio calculated from the variables were used to assess whether the patients were obese, overweight, normal or underweight. Data was analyzed as percentage, Z score statistics was used to analyze to help ascertain if there is difference in prevalence of obesity in male and female. **Result:** The results showed that higher percentage of the patients were either obese or overweight (56.4% and 58.29%) using BMI and waist-hip ratio respectively. Female type 2 diabetes were seen to be more obese or overweight 67.82% and 82.57% when compared to their male counterpart 43.1% and 32.35% using BMI and waist-hip ratio. The reasons may be due to the following: pregnancy, menopause, sedentary life style, less activity, use of contraceptives and dietary habits. **Conclusion:** However from the study, it is now evident that obesity is diabetogenic revealing the importance of maintaining normal weight and also weight reduction if overweight/obese. These could be achieved by public education about obesity and its complications, incorporating obesity and diabetes education in the school curriculum, enlightening the public on this issue through mass media.

Keywords: Assessment, Prevalence, Obesity, Newly–Diagnosed, Type-2-Diabetic-Patients,

INTRODUCTION

Obesity can be defined as a condition of abnormal or excessive fat accumulation in adipose tissue, to the extent that health is impaired (1). Therefore one is said to be obese when the person accumulates excess adipose tissue, 20% above his/her ideal body weight or using body mass index (weight/height^2) of 30 and above.

It is most common nutritional disorder in industrialized countries and is becoming increasingly prevalent in developing countries due to lifestyle. Obesity is associated with many diseases such as diabetes, heart diseases, hypertension, and some forms of cancer (1). This positive energy balance is currently prevalent in most developing countries for example Nigeria.

One of the chronic states which go hand in hand with obesity is diabetes mellitus (2). These two states have been referred to as the odd couples. Diabetic patients are often obese while on the other hand obese individuals frequently develop diabetes. Among all obesity related diseases, type 2 diabetes is most clearly and strongly associated with obesity.

Factors that must be considered as contributing to obesity are heredity, over eating, altered metabolism of adipose tissue, defective or decreased thermo genesis (the process by which calories are converted to heat) decreased physical activities without appropriate reduction in food intake and certain prescribed medication (3).

A close association between obesity and diabetes mellitus has long been recognized. Although most type 2 DM are obese, only a minority of obese individual develops diabetes probably because of genetic factor. The view that obesity is diabetogenic in those genetically predisposed to the disease is based on the fact that in simple obesity, there is still insulin resistance, particularly in muscle and hyperinsulinaemia (3).

The mechanism which includes the increase secretion of insulin and resistance to its own action, are being investigated. It is postulated that there is impaired insulin uptake by receptors in target tissue. Estimates of plasma insulin in patients with symptoms of diabetes immediately after diagnosis support this concept. Although some of those who are obese, however, have abnormally high plasma insulin, most show some degree of insulin

deficiency (3).

In general the more carbohydrate tolerance is impaired in obese diabetics, the more deficient the insulin secretory response to various stimuli (3). Obese people in general are less physically active than those whose weight is normal. Therefore, it is possible that physical exercise may reduce the risk of diabetes in susceptible individual (1).

The general objective is to assess the prevalence of obesity in type 2 diabetes mellitus clients.

Specific objectives:

- a. To ascertain the impact of obesity in the development of diabetes mellitus.
- b. To know the prevalence of obesity in both gender.

Obesity has been said to be associated with diabetes mellitus, due to change in dietary lifestyle in developing countries. Increase in the prevalence of obesity can be attributed to the following (4):

- Intake of more refined and processed foods instead of locally available staples and vegetables
- Sedentary way of life
- Lack of physical exercise etc

All these above contribute to adiposity

Diabetes is now on the increase because obesity can increase circulatory insulin levels, which will ultimately lead to increase insulin resistance (3).

Based on the above, more efforts are needed to reduce the excess weight of the masses which will go a long way in decreasing the onset of type 2 diabetes mellitus.

The significance of the study is to find out the prevalence of obesity in type 2 diabetes mellitus and to ascertain if obesity can predispose one to diabetes or vice versa this however will aid health workers to have a focus oriented health education to the public as well help researchers for further study.

METHODOLOGY

SCOPE OF THE STUDY

The area covered is diabetes clinic, UNTH, Ituku/Ozalla, Enugu State, located along Enugu-Port Harcourt express road. Out-patient that attend weekly Wednesday diabetic clinic were used for the study

SURVEY AREA

The study was carried out in University of Nigeria Teaching Hospital Ituku/Ozalla, Enugu State. Patients attending Wednesday diabetic out-patient clinic were used. The subjects were newly diagnosed persons with type 2 diabetes mellitus. The study period was 6 months.

Subjects: The number of subjects that were used for the study was 211 in number, 102 males and 109 females. They were all adults.

DATA COLLECTION

ANTHROPOMETRIC MEASUREMENTS

The anthropometric measurements of weight, height, waist and hip were taken. Simple instruments were used for the measurements.

WEIGHT MEASUREMENT

A beam balance was used. The weight was in kilogram. The patients were weighed without foot wears with minimum clothing worn. The scale was adjusted to zero before each measurement. The patients stood on the centre of beam balance without touching anything else. The measurement was taken to the nearest 50g.

HEIGHT MEASUREMENT

A measuring rod attached to the beam balance was used. The measuring was rod in centimeter. The foot wears were removed. The patients stood on the beam balance touching the edge of the beam balance, foot were parallel to each other and pointing forward. The patient's back was as straight as possible; this was achieved by relaxing the shoulder. The head was held comfortable, the arms at the sides. The patients' heels were matched to make sure that they did not beam. The measurement was taken to the nearest 0.1 centimeter.

WAIST CIRCUMFERENCE

A measuring tape was in taking waist circumference. The measuring tape was in centimeter. The waist circumference was taken with minimum clothing. Women were told to remove their wrappers and raise their blouse and men to raise their shirts before the measurement was taken round the waist. The measurement was taken to the nearest 0.1 centimeter.

HIP CIRCUMFERENCE

A measuring tape also was used in taking the hip measurement. This was also taken minimum clothing. The measurement was taken to nearest 0.1 centimeter

DATA ANALYSIS

Anthropometric data of weight and height were used to calculate BMI (wt/ht^2) and was compare to standard to find out those that were overweight or obese. The waist and hip circumference were used to calculate waist-hip ratio and was compared against normal or standard.

STATISTICAL ANALYSIS

Data was analyzed as percentage, Z score statistics was used to analyze to help ascertain if there is difference in prevalence of obesity in male and female.

RESULTS

Height and weight were used to calculate the body mass index (BMI) for each individual. The male and female data were separated analyzed and the prevalence of overweight ($25-29.9\text{kg/m}^2$) and obesity ($\text{BMI}>30\text{kg/m}^2$) were calculated. The information is as shown in the tables below;

Table 1: Distribution of patients into class of BMI with percentages

BODY MASS INDEX	RANGE	FREQUENCY	PERCENTAGE
Underweight	<18.4	10	4.74
Normal	18.5-24.9	82	38.86
Overweight	25-29.9	73	34.6
Obese	30 & above	46	21.8
Total		211	100

Table 1 show that 82 (38.86%) patients were of normal weights. Underweight patients were 10 (4.74%). Overweight and obese patients were 73 (34.6%) and 46 (21.8%) respectively.

Table 2a: Distribution of male patients into classes of BMI with percentages

BODY MASS INDEX	RANGE	FREQUENCY	PERCENTAGE
Underweight	<18.4	8	7.8
Normal	18.5-24.9	50	49.02
Overweight	25-29.9	34	33.3
Obese	30 & above	10	9.8
Total		102	100

From the above table, patients with normal BMI were higher in number, 50 (49.02%) whereas underweight patients were least 8 (7.8%). Patients who were overweight were 34 (33.3%) in number and obese male patients were 10 (9.8%).

Table 2b: Distribution of female patients into classes of BMI with percentages

BODY MASS INDEX	RANGE	FREQUENCY	PERCENTAGE
Underweight	<18.4	2	1.83
Normal	18.5-24.9	33	30.28
Overweight	25-29.9	38	34.8
Obese	30 & above	36	33.02
Total		109	100

Table 2b shows that the total number of female patients that were on normal weight were 33 (30.28%). Overweight female patients were higher in number, 38 (34.8%), followed by obese female patients, 36 (33.02%). Only 2 female patients were underweight (1.83%).

Table 3: Distribution of patients into classes of waist-hip ratio with percentages

Waist-hip ratio	FREQUENCY	PERCENTAGE
Above	123	58.29
Normal	52	24.64
Below	15	7.11
Nil	21	9.95
Total	211	100

Table 3 shows that higher percentage of patients 58.29% were above normal weight using waist hip ratio, 52

(24.64%) patients were within normal range, 15 (7.11%) were below.

Table 4a: Distribution of female patients into classes of waist-hip ratio with percentages

Waist-hip ratio	FREQUENCY	PERCENTAGE
Above	90	82.57
Normal	7	6.42
Below	3	2.75
Nil	9	8.26
Total	109	100

Table above shows that 82.57% (90) female patients were above normal range of waist-hip ratio, normal patients were 7 (6.42%). Only 3 (2.75%) were below the normal range.

Table 4b: Distribution of male patients into classes of waist-hip ratio with percentages

Waist-hip ratio	FREQUENCY	PERCENTAGE
Above	33	32.35
Normal	45	44.12
Below	12	11.76
Nil	12	11.76
Total	102	100

Table 4b shows that 32.35% (33) male patients were above normal range of waist hip ratio, normal patients were 45 (44.12%). 12 patients were above the range.

DISCUSSION

The result of this study shows that obesity is still a major health problem among patients attending this hospital diabetic clinic. In attempt to investigate whether obesity and overweight play a role in diabetes and also the prevalence of obesity in diabetics, diabetic patients attending diabetes clinic, UNTH, Ituku/Ozalla were investigated.

In table 1, obesity and overweight contributed to 56.4% of the population which was more than half the population. This is in line with a study conducted in United States between 1999-2002, where prevalence of obesity and overweight among adults with diagnosed diabetes was 57.9% for non Hispanic blacks and 59.5% for Mexican American (4). These values compared to a study conducted in University Hospital Aintree, Liverpool, UK by Diabetes and Endocrinology research group can be said to have reduced because in the study 86% of type 2 diabetes were either overweight or obese (5).

The reduction or decrease may be due to the following:

Economic status of the country: Due to poor economy of Nigeria today, people are now more active, moving from one place to another trying to make ends meet and this will come a long way in weight reduction.

Late diagnosis of the disease: Due to hardship, people do to go to hospital unless seriously ill or unconscious. Since they do not go to hospital on time, when at home, they may have loss of appetite and also infections and these may lead to inadequate food intake which may in turn predispose one to malnutrition thereby aiding weight loss. Table 2a and b where the patients were distributed into classes of BMI percentages with respect to their sex, there were higher percentage of overweight and obesity among females 67.82% than among their male counterparts 41.1%. This is in line with the research in some African countries by WHO in 1972 which showed that women were more obese than men. In South African blacks, there were 8% male obese, 44% female obese, also in Tanzania 1986/89, 0.6% men and 3.6% female (3).

According to research findings, obesity seems more in female than in males. The reasons for the above may be due to the following:

- Women are less active than men, therefore less energy is expended where intake is higher and this can accumulate overtime leading to overweight or obesity.
- Pregnancy: close interval of pregnancy can lead to excess fat deposition which when accumulated for a long time leads to obesity.
- Menopause: The effect of menopause which changes hormonal balance can lead to accumulation of fats.
- Sedentary life style: Women live more of sedentary lifestyle like watching television viewing which always goes hand in hand with snacking.
- Use of contraceptives: Some contraceptives contain steroids and this can lead to increase in weight.
- Dietary lifestyle

However, in men, obesity often run in families and they are not usually predisposed to obesity to make manifest

as a result of metabolic or environmental factors, but it is difficult to separate genetic from environmental factors (3)

Another indicator is the waist circumference or abdominal adiposity which is associated with excess abdominal fat and total body fat. Table 3 shows that higher percentage of the population were above normal using waist hip ratio which still points to higher percentage of obesity. SCN news no 33, 2006 stated that the evidence for a relationship between excessive weight gain, a high waist-hip ration and development of type 2 diabetes is strong. The waist circumference is a stronger predictor of risk for type 2 diabetes than BMI (4).

Table 4a and b show that higher percentage of women were above the normal range which indicates higher prevalence of obesity in women. It appears that in many Sub-Sahara countries, particularly in urban areas, there is marked increase in the prevalence of obesity in women, hypertension, diabetes and cerebrovascular disease (3).

CONCLUSION

There were more obese patients in type 2 diabetes and this affirms the saying that “obesity is diabetogenic” The number of females who were either overweight or obese were more than their male counterpart, this because female are highly predisposed to obesity due to pregnancy, menopause, less activity and dietary habits.

RECOMMENDATION

It is evident now that steps must be taken to decrease the prevalence of obesity in order to limit more serious conditions/complications. Factors most closely associated with obesity include dietary habits, lifestyle, extent of physical activity and maintenance of normal weight

- Weight management though healthy eating and physical activity can help reduce the number persons at risk from diabetes and also reduce risk for complications and premature mortality among those who already have diabetes.
- Public education about obesity and its consequences is strongly recommended, ways by which obesity and overweight can be controlled and prevented should be made known to the public.
- Education about obesity and diabetes mellitus could be incorporated in the school curriculum.
- Public lectures could be given on this important health condition and television programmes which are widely watched should focus on this topic.
- In the present study, illustration of higher prevalence of obesity among type 2 diabetes was made, it clearly highlight the need for prevention programme.

REFERNCES

1. World Health Organization (1995); Physical Status and Interpretation of Anthropometry. Report of a WHO Expert Committee, WHO Technical Report Series 854, Geneva.
2. Bierman E. I., Bagdade J. D. and Porte D., (1968). Obesity and diabetes. The old couple. *American journal of clinical nutrition* 21 1434-7
3. WHO/FAO, (2003). Diet, Nutrition and the prevention of chronic Disease. A report of joint WHO/FAO expert consultation, Geneva, 28 January – 1st February 2002. WHO technical Report Series 916 WHO, Geneva.
4. SCN News, (2006). Diet related chronic diseases and the double border of malnutrition in West Africa No 33 pg 7-9.
5. Daousi C. (2006). Prevalence of obesity in type 2 diabetes in secondary care association with cardiovascular risk factor, postgraduate medical journal 82; 280-384.

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