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BURDEN OF OBESITY IN ESSENTIAL HYPERTENSION: PATTERN AND PREVALENCE

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ABSTRACT
Obesity continues to be an epidemic worldwide. There also continues to be a relationship between obesity and hypertension both causal and consequentially. The study aims at determining the prevalence and pattern of overweight and obesity among our patients being managed for essential hypertension.

Material and Methods: The study was a cross sectional study. Consecutive patients diagnosed with essential hypertension were recruited from two university teaching hospitals in the South West of Nigeria. Demographic data such as age, gender, weight and height were obtained from patients at recruitment. Patients with congestive heart failure, secondary hypertension, chronic kidney disease, and other chronic diseases were excluded. Pregnant women were also excluded. Obesity was defined according to WHO classification.
Statistical analysis was done by the Statistical Package for Social Sciences version 11.0.

Results: One thousand one hundred and two (1102) consecutive hypertensive patients were recruited. Two hundred and eighty six (286) were dropped due to evidence of overt heart failure (98) and chronic kidney disease and others (188).
There were (420) males (51.5%) and 396 females (48.5%), mean age 54.97 (±13.14) years. (Range 10-91). 7.6% (62) were underweight (36 males, 26 Females): 260 (31.9%) were overweight, consisting of 148 males and 112 females: 135 (16.5%) had mild obesity consisting of 48 males and 87 females: 43(5.3%) had moderate obesity with 15 males and 28 females while 30 (3.7%) had severe obesity (consisting of 22 females).

Conclusion: About two thirds of the hypertensive patients seen in two teaching hospitals in the South West of Nigeria in this study were either overweight or obese. Therefore lifestyle modification geared toward weight reduction should be emphasized in these patients.

Key Words: Obesity, essential hypertension, burden, prevalence *(Accepted 24 November 2009)*

INTRODUCTION
Obesity has become a major public health concern worldwide. It is now recognized by major health promotion bodies as a major cardiovascular risk factor as cardiovascular disease continues to become a major cause of morbidity and mortality even in the developing countries where it has been estimated that up to 75% of the expected increase in the cardiovascular disease burden will come from by 2020. The increase in obesity worldwide will have an important impact on the global incidence of cardiovascular disease and type 2 diabetes mellitus. [1, 2] . Obesity is excessive accumulation of adipose tissue, while overweight represents a body weight exceeding the normal for a person's gender, age, height and build. The National Cholesterol Education program (Adult Treatment Panel III) recognized obesity, physical inactivity, and atherogenic diet as major risk factors for Cardiovascular disease.[3]

Obesity is a component of the metabolic syndrome which represents a cluster of risk factors for cardiovascular disease. This cluster of risk factors includes type 2-diabetes mellitus, elevated triglyceride level, elevated low density lipoprotein (LDL), low high-density lipoprotein, elevated blood pressure and obesity. Obesity is thought to be the primary substrate in its development by various international bodies such as World Health Organization (WHO), American Diabetes Association (ADA) and the International Diabetes Federation (IDF).

The Seventh Joint National Council on Prevention, Detection, Evaluation and Treatment of High Blood pressure in its report (JNC VII report) also recognizes obesity as a major cardiovascular risk factor and reports that a weight loss of 10kg may lead to a reduction in blood pressure of up to 5-20mmHg. Thus it is a major lifestyle modification in the management of hypertension.[4]

The risk of diabetes is particularly increased by

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obesity especially android obesity; 80-95% of the increase in diabetes can be attributed to obesity and overweight with predominant abdominal fat distribution.[4,5] Overweight and obesity are risk factors for certain cancers including breast and ovarian cancer,[6-8] impaired glucose tolerance[9] and increased mortality.[10] In addition, overweight also exacerbates many other chronic diseases, such as hypertension,[11] osteoarthritis,[12] gallstones,[13] dyslipidemia, and musculoskeletal problems.[14]

The current epidemic of obesity is caused largely by an environment that promotes excessive food intake and discourages physical activity .Urban populations in different countries have changed their diets increasing fat and sugar consumption and decreasing fiber intake leading to overweight, obesity and more cardiovascular deaths. There is a complex link between poverty and obesity which may be responsible for the increasing numbers of obese people even among the poorer segments of the society. Low educational attainment, which is a strong predictor of health behaviour, is a major link between them. Therefore, primary prevention of obesity is needed among youths and women, particularly among those from lower socio-economic backgrounds.

It is also known that the age of obesity onset may have a significant influence in the persistence of obesity and adverse consequences in adult life Treatment of obesity and other risk factors for cardiovascular diseases should be initiated as early as possible.[15]

Strategies given to address the problem of childhood obesity among ethnic minorities include increasing the child's physical activity, reducing television viewing and the adoption and maintenance of healthy lifestyle practices for the entire family.

The World Heart Federation recommends that obesity prevention programs should be high on the scientific and political agenda of both industrialized and industrializing countries. Promoting healthy lifestyles should be national priorities and international priority, beginning in schools and carried over into work places, communities and the health care system as a whole.

This study aimed at using the body mass index to identify the pattern and prevalence of obesity in our population of patients with hypertension in the South Western Part of Nigeria.

MATERIALS AND METHODS

The study was a cross sectional retrospective study conducted in the divisions of Cardiology of two University Teaching Hospitals in the South Western part of Nigeria. LAUTECH Teaching Hospital,Osogbo and Obafemi Awolowo University Teaching hospital, Ile-Ife both in Osun State both rendering primary, secondary and tertiary health care services to more than four states in the South West of Nigeria.

The case records of One thousand one hundred and two patients (1,102) seen over a two year period (January 2006-January 2008) were retrieved. The parameters studied included age, gender, diagnosis, weight in kilograms, height in meters, diastolic and systolic blood pressures.

Hypertension was defined as blood pressure= 140/90mmHg measured using the right arm when the patient is fully rested for at least ten minutes or patient already on antihypertensive therapy. Blood pressure was measured using Mercury (Accosson) sphygmomanometer. Various indices have been used for assessment of obesity in the population. These include body mass index which is derived by weight in kilograms divided by square of height in meters. Obesity is defined as BMI > 30Kg/m2. Waist circumference and waist hip ratio are also used. Body mass index was determined by weight (kilogram) / height (m^2). Obesity was defined according to the WHO criteria. Normal body mass index (BMI) is 19.5-24.9. Overweight is BMI 25-29.9. Mild obesity, 30-34.9, moderate obesity 35-39.9 while severe obesity is BMI =40Kg/m^2.

Excluded from the study were patients with clinical heart failure, chronic renal failure, pregnancy and chronic diseases. Data were expressed as means ± Standard deviation. The analysis included using independent samples t-test and chi square appropriately. p value of = 0.05 was taken as measure of statistical significance. Ethical clearance was obtained for the study.

RESULTS

Records of one thousand one hundred and two patients with clinical diagnosis of hypertension were retrieved. Two hundred and eighty six were dropped because of either incomplete data or associated diagnosis of congestive cardiac failure, chronic kidney disease, pregnancy or chronic diseases such as tuberculosis, carcinomas etc.

Four hundred and twenty were males representing 51.5% of the population studied, and there were 396 females (48.5%). The mean age was 54.97(±13.14) years. Sixty two, 62(7.6%) were underweight, 260(31.86%) have a normal body mass index, 286(34.4%) were overweight, 135(16.5%) had mild obesity, 43(5.5%) had moderate obesity and 30(3.8%) had severe obesity.

The demographic data are represented in Table 1 according to gender.

Table 1: **Demographic Data of the Study Population.**

Parameter	Male	Female	P value
Age	56.03 ± 12.8	53.8± 13.4	0.017 **
Systolic blood pressure	140.48 ±25.3	142.57 ±28.13	0.283
Diastolic blood pressure	86.7 ±15.08	89.22± 15.44	0.638
Body mass index (BMI)	25.54 ±4.96	27.63± 5.96	<0.0001**

** Statistically significant.

There was marked difference in the mean age and body mass indices between both sexes. There was no statistical significance between systolic and diastolic blood pressures in the male and female patients. The pattern of body mass index (BMI) among both is highlighted in Table 2.

Table 2: **Pattern of body mass index (BMI) among the sexes.**

Parameter	Male	Female	P value
Underweight	36	26	0.089
Normal weight	153	107	0.031**
Overweight	160	126	<0.001**
Mild Obesity	48	87	<0.001**
Moderate Obesity	15	28	0.013**
Severe Obesity	8	22	0.001**
Total	**420**	**396**	

** Statistically significant.

DISCUSSION

The burden of obesity in hypertension is enormous and weight reduction is advocated in the management. This is associated with reduction in blood pressure, improved insulin sensitivity and improved quality of life generally.[1] The mean age of the population studied was 54.97 ± 13.14 years. Of these, 7.6% were underweight, 31.9% had normal body mass index, 35.0% were overweight and 23.3% were obese. This agrees in part with a similar report from Abeokuta recently, except that the frequency of obesity in our study was less than reported there. (25.6% versus 33.7%) while the frequency of underweight in our study was more than the reported one in the same study from Abeokuta. (7.6% versus 33.7%). [16] This suggests that there may be an added geographic distribution in the pattern of underweight and obesity in patients with essential hypertension across Nigeria. The noted difference is likely due to difference in social status and economic class of the masses in the places studied. Underweight per se is also associated with increased cardiovascular risk, just like overweight and obesity

The National Health and Nutrition Examination Survey (NHANES) reports that 61% of the United States population are overweight while 30.6 % were obese.[17]

The increasing urbanization in a developing country like Nigeria therefore means that except urgent steps are taken to halt the looming epidemic of obesity and its related morbidity and mortality, it may lead to an astronomical deprivation of the already poor economies of these countries.

Obesity increases with age in both sexes but more especially in men. There were more men with overweight than females in this study. Overweight in men may be due to android obesity due to significantly higher amount of abdominal fat which leads to endocrinologic imbalances such as increased activity of the hypothalamic pituitary adrenal axis, glucocorticoid activity and greater expression of glucocorticoid receptors in visceral adipocytes.[18]

This study shows that obesity is more common among females than males in agreement with similar studies.[5,9,13,23] Women are however more prone to gluteo-femoral lipogenesis and fat deposition and account for the increased frequency of obesity among females in this study. The increasing prevalence of obesity among the female subjects in this study emphasizes the importance of introducing preventive strategies among them to reduce the associated increasing cardiovascular morbidity.

This study showing increased prevalence of overweight and obesity among patients with hypertension also agrees with earlier studies.[19-22] A report from Morocco revealed high prevalence of hypertension and obesity in 23.9% and 16.5% respectively in a study of 213 women sampled from an agricultural province. This association also correlated with high prevalence of dyslipidaemia among the obese women.[23] Patients with obesity have also been shown to have associated ST-T wave (repolarization) abnormalities on their ECG than their normal and overweight counterpart which signifies a higher cardiovascular risk profile.[24]

CONCLUSION

The prevalence of overweight and obesity among patients with hypertension in Nigeria is presently high. Therefore there is a need to reduce this CVS/Endocrine burden by way of massive health education, appropriate Government legislation and provision of sporting and recreational facilities for the general public.

The limitation in this study is that it is a hospital

based retrospective study, which may not truly reflect the population distribution of the factors being studied. A population based study may provide a more reliable and comprehensive information about the prevalence and pattern of obesity among hypertensive Nigerians.

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