
Research Article

Association between Blood Pressure, Body Mass Index (Bmi) and Age amongst Women in a Community in Cross River State of Nigeria.

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Abstract:

BACKGROUND: High body mass index (obesity) is a great health threat to aging individuals which results in increased blood pressure.

MATERIALS AND METHODS: The Study was carried out in four different communities namely: Ikom, Akamkpa, Calabar South and Calabar Municipal of Cross River State, Nigeria. It was carried out amongst 130 women who voluntarily gave their consent during a cervical screening done in their various locations during the period of December 2016 to January 2017 in Cross River State, Nigeria. Blood pressure was measured using a standard mercury sphygmomanometer to obtain both the diastolic and systolic blood pressure of the various individuals. The height and weight were obtained using a weighing balance and a stadiometer respectively to get the weight and height. It was summarized age group wise and cut off points gotten from the individuals and reviewed using the WHO classification of body mass index classification. Data obtained were presented using frequencies and percentages.

RESULTS: Underweight individuals (8) had a total percentage of 6.15%. A total of 46 (35.40%) of the individuals were of normal weight. 46 and 30 of the individuals had a percentage of 35.40% and 23.08% respectively (overweight and obese). A maximum number of the individuals were normal (were neither prehypertensive nor hypertensive). 49 and 19 individuals were prehypertensive in systolic and diastolic blood pressure respectively and 7 and 16 were hypertensive in systolic and diastolic blood pressure respectively.

CONCLUSION: A high body mass index and hypertension correlate with advancing age. and can be prevented by living an acceptable lifestyle devoid of it Triggers like alcohol, smoking, reduced salt intake etc and having a regular routine check-up done periodically.

INTRODUCTION

Recent studies show that so many disease and conditions have been closely associated with aging and a high blood pressure (hypertension) such as cardiovascular diseases (CVD), diabetes mellitus and other chronic diseases (1). Overweight and obesity increase the risk of elevated blood pressure which is significantly associated with increased systolic and diastolic blood pressure. As body mass index increases there is tendency for a commensurate increased risk of hypertension. Hypertension is defined as high blood pressure greater than 140/90 mmHg (2).

Worldwide, obesity (high body mass index) has been estimated to be a leading cause of death (3). Being overweight predisposes one to having a high blood pressure, certain heart

diseases and some cancers which progresses as one ages. Mortality rate increases with increasing degrees of overweight, Obesity being a non-communicable disease is seen as a symbol of beauty and virility commonly seen amongst certain tribes like the the Annang indigenes of Akwa Ibom (4). The rise in standard of living and increasing changes in lifestyle in a country such as Nigeria, has posed a threat to the health of the citizens as this has led to weight gain and obesity in subsequent years (5). Several studies show that due to the process of modernization and rapid economic development there is a rapid increase in the cases of hypertension which is due to the loss of flexibility of the blood muscles as a result of the deposition of fats (high BMI) and aging (6).

This study is aimed at finding the association of overweight (high BMI), blood pressure and age and implementing preventive strategies and to create awareness amongst people in the semi-rural areas to meet the required BMI of 18.5 and the normal blood pressure 120/80mmHg and gear towards having a healthy lifestyle during ageing as socio economic development has created changes in the living patterns of individuals such as dietary intake, food consumption patterns and their rate of physical activities and to help restore a healthy and acceptable living pattern.

METHODOLOGY:

Study location:

The study was done in four different communities they include; Ikom, Akamkpa, Calabar south and Calabar municipal. Body Mass Index (BMI) is practically measured by taking the weight (mass) and height of an individual. The individuals were examined during a cervical screening test conducted in a clinic within the period of 15th December 2016 to 5th January 2017.

Patients and procedure:

The study was done amongst 130 females; age ranging from 18-70 years. The individuals were divided into five different groups with ten years interval each in order to study the age trend of body mass index and blood pressure. Proper orientation was given and those who volunteered and gave their consent were recruited in the study. The height was measured using stadiometer and the weight was measured using portable spring weighing machine in light clothing and without shoes. For blood pressure measurement, a standard mercury sphygmomanometer with appropriate cuff size was used to measure blood pressure. The individual subject was asked to sit comfortably with arms supported comfortably and the cuff applied closely to the upper arm. The cuff was rapidly inflated to pressure above the level at which the radial pulse could no longer be felt. The stethoscope was placed lightly over the brachial artery and the mercury column was immediately allowed to fall further till the sound ceased to be tapping in quality, became fully muffled and finally disappeared. At this point, it is called diastolic. The cuff was then deflated to zero pressure. Correlation analyses were done to determine the association between body mass index, age, systolic and diastolic blood pressure. The values of individual BMI were calculated and summarized age group wise and the cut-off points gotten from the individuals. Body mass index (BMI) is calculated as the weight in kilograms divided by the square of the height in meters (kg/m²). A BMI of over 30kg/m² is said to be obese while a BMI of over 25kg/m² is defined as overweight, while the normal range for BMI according to WHO is 18.5 -24.9kg/m².⁷ The value of BMI was calculated and summarized age group wise and the value of blood pressure was classified based on Joint National Committee On Prevention, Detection, Evaluation and Treatment of high blood pressure (JNC) (8). JNC defines normal blood pressure as less than 120/80mmHg, Pre

Hypertension as 120-139/80-89mmHg, Stage 1 Hypertension as 140-159/90-99mmHg and Stage 2 Hypertension as > 160/100mmHg.⁽⁸⁾

RESULTS:

Table 1: shows age range among the individuals

AGE RANGE	FREQUENCY	PERCENTAGE (%)
17-27	29	22.31
28-37	28	21.54
38-47	19	14.62
48-57	52	40
58-67	2	1.54
TOTAL	130	100

Table 2: shows educational qualification among the individual

EDUCATIONAL QUALIFICATION	FREQUENCY	PERCENTAGE (%)
PRIMARY	29	22.31
SECONDARY	46	35.39
TERTIARY	55	42.31
TOTAL	130	100

Table 3: shows frequency of BMI stratification

BMI CLASSIFICATION	FREQUENCY	PERCENTAGE (%)
UNDERWEIGHT <18.54	8	6.15
NORMAL WEIGHT 18.5-24.9	46	35.40
OVERWEIGHT 25-29.9	46	35.40
OBESITY ≥30.0	30	23.08

Table 4: Systolic blood pressure ranges and frequency

SBP CLASSIFICATION	FREQUENCY	PERCENTAGE (%)
NORMAL	74	56.92
PREHYPERTENSION	49	37.69
STAGE 1 HYPERTENSION	4	3.08
STAGE 2 HYPERTENSION	3	2.31
TOTAL	130	100

Table 5: Diastolic blood pressure and frequency of values

DBP CLASSIFICATION	FREQUENCY	PERCENTAGE (%)
NORMAL	95	73.10
PREHYPERTENSION	19	14.62
STAGE 1 HYPERTENSION	12	9.23
STAGE 2 HYPERTENSION	4	3.08
TOTAL	130	100

Table 6: General characteristics of the participants

Variables	Mean ± SD	t value	p value
AGE (in years)	35.45±11.67	-2.296	0.025
BMI	26.73±5.83	-1.350	0.182
SBP (mmHg)	115.83±17.42	-0.771	0.444
DBP	75.81±13.77	-0.236	0.814

(n=130)

The study was done amongst 130 women. As assessed by BMI, a large number of individuals were overweight having a significant percentage of 35.40% and 23% were obese. Going by the values for SBP and DBP a significant number had prehypertension having a total percentage of 34.69% and 14.62 respectively.

DISCUSSION

Age was positively correlated with blood pressure and a high body mass index. In general, blood pressure increases as one gets older as it has been reported that age is a risk factor for high blood pressure (9, 10). Obesity or excess fat has been found to be associated with increased morbidity and mortality (11). Hypertension and pre-hypertension in present studies has its prevalence amongst the females which is as a result of high fat deposition in the heart's pacemaker system leading to degeneration of the heart muscle cell resulting in the low performance of the cardiovascular system. (12,13). Obesity-associated hypertension can be explained as inadequate vasodilatation in the presence of increased blood volume and cardiac output which are natural consequence for increased body mass. As one ages, blood vessels lose its flexibility which lead to hardening of arteries that helps to increase blood flow leading to degeneration of heart muscles cells and thickening of its cell walls, so for an obese individual it means more tissue for blood delivery which means the resistance at the heart region is greater than the fat present so venous return reduces when there is lean body mass to help fight gravity and return back to the heart but reverse is the case in obese individuals. According to a study published by Daniel WJ and his colleagues, they concluded that age and weight are positively correlated with high blood pressure. Hypertension has been categorized as a disease of modernization resulting from incompatible interaction between modern affluent lifestyle on human physiology and it can be reduced by dietary and lifestyle modification. Several other factors have been closely associated with increased BMI such as stress which leads to the release of certain hormones that may change body metabolism, according to a 2000 study, cortisol which is released during time of stress, stores more fat tissue primarily around the abdomen. Also, stressed people engage in compulsive eating habits resulting in low metabolism during aging which leads to deposition of calories as fat tissue.

CONCLUSION:

In conclusion, age and high body mass index positively correlated with blood pressure values. Hypertension is a silent

killer and is associated with high morbidity and mortality because of its attendant complications. Hence, proper screening and checkup is vital for aging individuals.

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