

Prevalence and Pattern of Hypertension in Ikom, an Urban Community in Cross River State, South-Southern Nigeria

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Abstract

Background: Hypertension, a prominent cause of morbidity and mortality in Africa, and to a great extent, Nigeria, Africa's most populous country. Hypertension constitutes a major public health challenge; it is the most important risk factor for cardiovascular disease.

Objectives: This study aimed to estimate and determine the prevalence, pattern and some risk factors for hypertension among the populace living in Ikom an Urban community of Cross River State, South-Southern Nigeria hence ensuring its effective awareness and control.

This was done based on the normal cut off of 140/90mmHg.

Method: A descriptive cross-sectional community-based survey was used, involving 113 male and female adult respondents aged 18-79 years selected by random sampling method. Behavioral data was measured using World Health Organization (WHO) Stepwise approach to chronic disease risk factor surveillance (STEPS 1&2). Hypertension was defined as Systolic Blood Pressure (SBP) \geq 140mmHg and/or Diastolic Blood Pressure (DBP) \geq 90mmHg or being on a regular/current anti-hypertensive drug therapy. Data were analyzed using descriptive statistics

Results: A total of 113 adults of Ikom local government area, cross river state participated in the study [26 (23%) men and 87 (77%) women] $\chi^2 (47, 133) = 43.943, p=0.60$. The age range was 18 to 76 years. The mean age 50.35 ± 13.76 and the mean Body Mass Index (BMI) was recorded as 25.59 ± 4.96 . The mean blood pressure of all the participants are 138.50 ± 29.05 for SBP and 77.78 ± 15.06 for DBP respectively. A moderate correlation was observed between age and blood pressure indices $r=0.489$ and $0.390, p<0.001$ for SBP and DBP respectively. The prevalence of hypertension among the study population was 37.17%. The prevalence of obesity was 16.8%.

Conclusion: The prevalence of hypertension among the dwellers of Ikom, Cross River State Nigeria was relatively high. Also, the prevalence of obesity a risk factor for developing hypertension and other cardiovascular diseases was high. Urgent intervention by the government and other health organizations will go a long way in curbing this trend.

Keywords: Hypertension, Prevalence, Urban, Ikom

Introduction

Hypertension is defined as abnormally high or raised blood pressure; it is a medical condition in which the blood pressure in the arteries is elevated. [7,8] Hypertension is a major public health burden, unlike before when it was regarded as uncommon. Several studies had shown it to be a prominent cause of morbidity and mortality in Sub-Saharan Africa (just like malaria, tuberculosis, HIV/AIDS, etc). Hypertension is a major non-communicable disease (with no specific signs

and symptoms in its initial stage [21]) that poses as an indication of a soon-to-come danger [1]. Its prevalence cuts across all categories of the population, having its effect on approximately one billion people globally (as estimated in year 2000 with an expected increase by year 2025 to 1.5 billion people) [2] and causing 7.1 million recorded deaths annually [3]

It was recorded by the World Health Organization (WHO) that the prevalence of hypertension is highest in the African region at 46% of adults aged 25 years and above, while the lowest was found in the American region. [22,23] Previous studies in Sub-Saharan Africa had shown hypertension to be more widespread in urban centers to rural communities [4,5]. Aside genetic factors,

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hypertension has also been attributed to several other behavioral, socioeconomic and metabolic risk factors, the rapid urbanization associated with the growing increase in age and lifestyle changes (e.g. high rates of alcohol intake, physical inactivity, smoking, diabetes, salt intake, poor diet, overweight and obesity). The disease puts one at risk of serious end organ damage and cardiovascular diseases (e.g. congestive heart failure, ischemic heart disease, coronary heart disease), stroke, chronic renal failure, blindness, etc [4, 8, 9].

Nigeria, a developing country in West Africa has not been spared by the global epidemic of hypertension, as it had been reported to be the commonest cardiovascular disease, with a high incidence rate. The Nigerian National Non-Communicable Disease Survey in 1997, using a blood pressure cutoff value of 160/95mmHg for hypertension had a prevalence of 11.4% (which could have been higher if the new cutoff value of 140/90mmHg was used) [20]. Other recent studies had reported its high prevalence in the country also [6, 18, 24]

Hypertension constitutes 25% of emergency medical admissions in Urban hospitals in Nigeria [25] and is usually unaccompanied by any signs in its early stages. As a result of these identified changes in epidemiologic trend of hypertension and its complications, there is need to regularly conduct a survey on its prevalence, an important tool for assessing its magnitude, in order to implement effective control strategies (as its awareness, detection, treatment and control has been extremely low due to scarce resources & inadequate health provision) to slow the rise in the disease occurrence.

Being that hypertension is becoming more rampant and in recent times seen as a silent killer that causes sudden unexpected natural death, this study aims at determining the prevalence, pattern and some risk factors for hypertension among the populace living in the Urban community of Ikom Local Government in Cross River State, South-Southern Nigeria. It is expected that the result gotten from this research study will be useful in raising awareness among policy makers, health workers and the public at large about the prevalence of hypertension and thereby assisting in the design and implementation of appropriate cost-effective intervention and control measures.

Methodology

A descriptive cross sectional community-based design was used for this study, with its setting in Ikom Local Government Area, an Urban Community of Cross River State. This was carried out from 15th December, 2016 – 5th January, 2017. The study involved 113 adult respondents of both sexes aged from 18-79 years selected by random sampling method, who were duly informed about the purpose of the study and their consent fully obtained.

The procedure for the measurement of behavioral data for this study was carried out in two ways: Step one had to do with gathering the sociodemographic data of the participants. Eligible and consented participants had

their data (e.g. age, sex, educational status, marital status, educational level, medical and family history of hypertension, etc.) obtained by issuing well-structured questionnaire to be duly completed by them or on their behalf. Step two captured gathering of anthropometric data of the participants. Subjects were fully examined, with their physical measurements (that include height in meters, weight in kilograms and BP) taken and recorded at this stage.

Weight was measured to the nearest 0.5kg using a standard weighing scale while ensuring that participants were; standing, in light clothing and removed foot wears. Height was also measured to the nearest 0.5cm using a stadiometer while ensuring that the participant's heels, back and occiput were touching the scale with eyes looking straight ahead during measurement. These parameters were then consequently used to calculate their Body Mass Index (BMI) using the formula- $\text{Weight (in Kg)} \div \text{Square of Height (in meters)}$.

Blood pressure was measured using a good brand of mercury sphygmomanometer (Omron Healthcare Inc., Vernon Hills, Illinois, USA) with appropriate cuff size (16 x 30cm or 13 x 23cm), while ensuring the respondent's feet was flat on the floor and the left arm fully resting on the table to ensure it was at heart level. The cuff was securely fastened on the upper left arm of the participants using the fabric fastener strip and the BP taken after 10 minutes of relaxation. The 1st phase of korotkoff sound was taken as the Systolic Blood Pressure (SBP) while its 5th phase was taken as the Diastolic Blood Pressure (DBP). 3 consecutive measurements were made at an interval of 3-5 minutes after a 10 minutes rest. Thereafter, the mean of the SBP and DBP for the second and third measurements were recorded as the subject blood pressure (represented as SBP/DBP) for the data analysis.

Hypertension, formerly defined as mean systolic blood pressure (SBP) and diastolic blood pressure (DBP) of value 160/95mmHg [10,11,12] was modified based on the recently published seventh Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC VII) guidelines [13] and the World Health Organization and International Society of Hypertension guidelines [14] to a second cut-off point of 140/90mmHg or being on a regular/current anti-hypertensive drug therapy.

Using the JNC VII classifications of hypertension [13], the participants were categorized for SBP as follows: normal = less than 120mmHg, prehypertension = 120-139mmHg, stage 1 hypertension = 140-159mmHg, and stage 2 hypertension = greater than 160mmHg; whereas for DBP the participants were categorized as follows: normal = less than 80mmHg, prehypertension = 80-89mmHg, stage 1 hypertension = 90-99mmHg, and stage 2 hypertension = greater than 100mmHg.

Data Analysis: The Statistical Package for Social Sciences (SPSS) version 20 statistical software was used for data analysis. For continuous variables, mean values

and standard deviations were calculated. Gender differences and age in prevalence rates were compared with Pearson Chi-Square. Pearson correlation coefficient was used to analyze the relationship between blood pressure, age and anthropometric data. Values of p below 0.05 were considered statistically significant.

Results

There were 113 subjects who participated in the study, consisting of 26 (23.0%) males and 87 (77.0%) females. Age-wise distribution of the participants showed the highest proportion, 33 (29.2%) in the 40-49 years' age-group. There was no significant relationship between the age of the participants and their gender $X^2(47, 133) = 43.943, p=0.60$. The mean SBP and DBP were 138.50 ± 29.05 and 77.78 ± 15.06 respectively. The mean BMI and Pulse rate were 25.59 ± 4.96 and 79.20 ± 12.96 . There was moderate moment Pearson correlation between the age of the participants and blood pressure determinants (SBP and DBP) $r=0.489$ and $0.390, p<0.001$ respectively. A strong correlation was observed between systolic and diastolic blood pressure $r = 0.833, p<0.001$. A moderate correlation was also observed between pulse rate, SBP and DBP Pearson $r = 0.327$ and $0.340, p<0.01$ respectively. No significant correlation was observed between Body mass index (BMI) and the other anthropometric indices.

From the survey, the total prevalence estimate of hypertension based on 140/90 mmHg definition was 37.17%. Isolated Systolic Hypertension (ISH) was 38.9% whereas Isolated Diastolic Hypertension (IDH) was 16.8%. The frequency distribution of BP categories of the respondents is shown in Tables Body Mass Index categorized into four groups- Underweight, Normal, Overweight and Obese was recorded as 5 (4.4%), 51 (45.0%), 38 (33.6%) and 19 (16.8%)

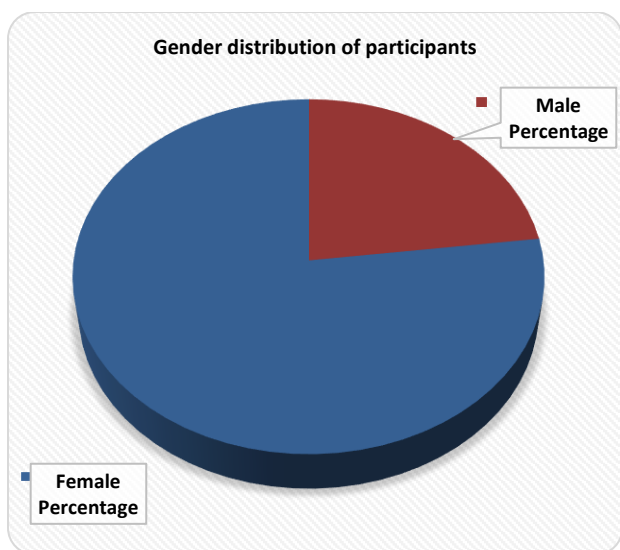


Figure 1: Showing gender distribution of the participants A total of 113 participants made up of 26 (23.0%) males and 87 (77.0%) females

Table 1 Showing the age distribution of the participants

Age Range	Frequency	Percentage (%)
18-28	7	6.2
29-39	15	13.3
40-49	33	29.2
50-59	25	22.1
60-69	20	17.7
70-79	13	11.5
Total	113	100.0

The table shows the participants age distribution with the highest being the 40-49 age-group 33 (29.2%) and the lowest being the 18-28 age-group 7 (6.2%)

Table 2 Showing the frequency and percentage of isolated systolic blood pressure

SBP Classification	Frequency	Percentage
Normal	30	26.5
Prehypertension	39	34.5
Stage 1 hypertension	18	15.9
stage 2 hypertension	26	23.0
Total	113	100.0

Frequency distribution of Systolic BP- showing normal, prehypertension and hypertension as 30 (26.5%), 39 (34.5%) and 44 (38.9%) respectively. Stage 1 and stage 2 hypertension was recorded as 18 (15.9%) and 26 (23.0%) respectively.

Table 3 Showing the frequency and percentage of isolated diastolic blood pressure

DBP Classification	Frequency	Percentage
Normal	66	58.4
Prehypertension	28	24.8
Stage 1 hypertension	8	7.1
Stage 2 hypertension	11	9.7
Total	113	100.0

Frequency distribution of Diastolic BP- showing normal, prehypertension and hypertension as 66 (58.4%), 28 (24.8%) and 19 (16.8%) respectively. Stage 1 and stage 2 hypertension was recorded as 8 (7.1%) and 11 (9.7%) respectively.

Table 4 For showing the association between blood pressure ranges and gender distribution of the participants

BLOOD PRESSURE RANGE	FEMALE (%)	MALE (%)	TOTAL
<90/60 (low blood pressure)	0 (0)	0 (0)	0 (0)
>90/60 but <120/80 (ideal and healthy)	25 (28.74)	14 (60.87)	39 (34.51)
>120/80 but <140/90 (normal/pre-high blood pressure)	26 (29.89)	6 (11.32)	32 (28.32)
>140/90 (high blood pressure)	36 (41.80)	6 (11.32)	42 (37.17)
Total	87 (77.00)	26 (23.00)	113 (100)

A total of 39 (34.51%) of the participants was observed to possess an ideal and healthy BP. 32 (28.32) have pre-hypertensive BP. The prevalence of hypertension was recorded as 37.17% among the study population.

Frequency distribution of Body Mass Index categorized into four groups- Underweight, Normal, Overweight and Obese was recorded as 5 (4.4%), 51 (45.0%), 38 (33.6%) and 19 (16.8%)

Table 5 Showing the frequency and percentage of Body Mass Index Classification

BMI Classification	FREQUENCY	PERCENTAGE (%)
Underweight <18.54	5	4.4
Normal weight 18.5-24.9	51	45.0
Overweight 25-29.9	38	33.6
Obesity ≥30.0	19	16.8
Total	113	100

Table 6 Showing the frequency and percentage of Pulse rate

Pulse Rate	Frequency	Percentage
Normal	103	91.2
Fast pulse rate	6	5.3
slow pulse rate	4	3.5
Total	113	100.0

Majority of the participants possesses a normal pulse rate.

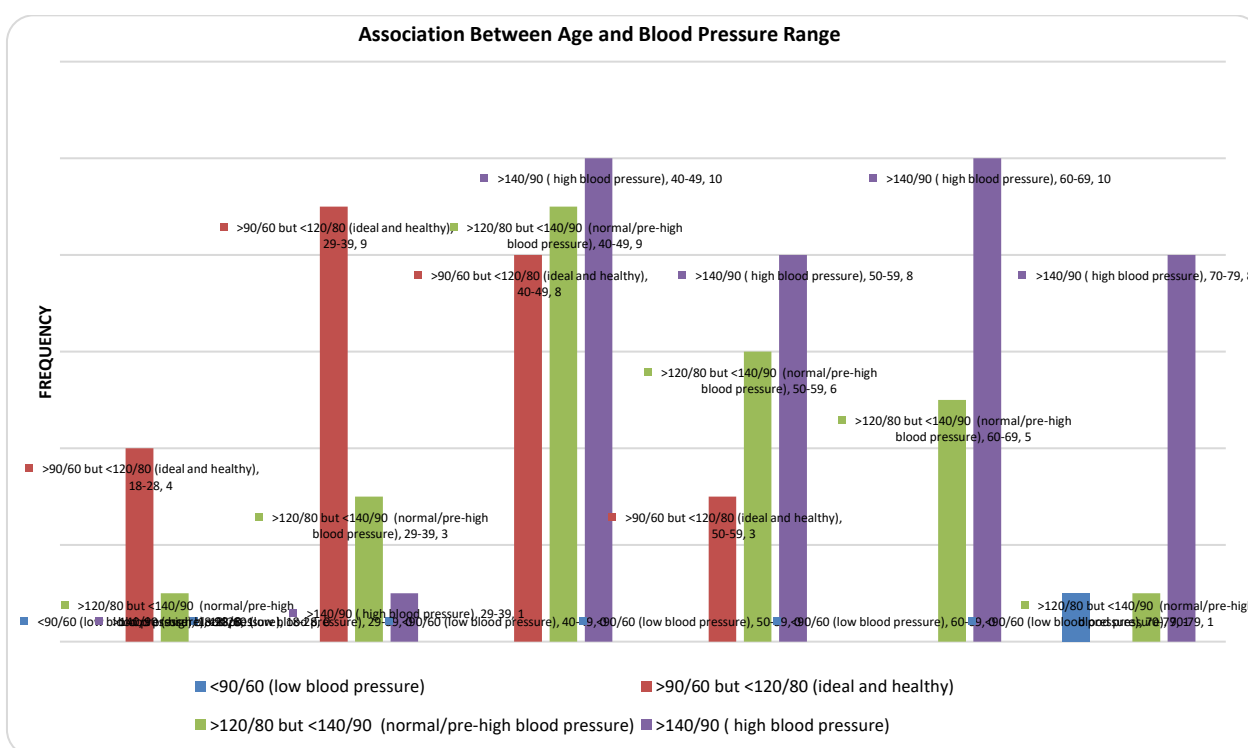


Figure 2 Showing the Association Between Age and Blood Pressure

The age range 40-49 presented with the largest number of participants 33 (29.2%). The highest number of participants with high blood pressure was observed in the age range 40-49 and 60-69 years.

Table 7: Correlation matrix between BMI, Blood Pressure, Pulse Rate and Age

Variables	BMI	SBP	DBP	PULSE RATE	AGE
BMI	1	0.129	0.086	0.164	0.102
SBP	0.129	1	0.833**	0.327**	0.489**
DBP	0.086	0.833**	1	0.340**	0.390**
PULSE RATE	0.164	0.327**	0.340**	1	-0.037
AGE	0.102	0.489**	0.390**	-0.037	1

Correlation is significant at the **0.05 level (2-tailed)

There was moderate moment Pearson correlation between the age, SBP and DBP $r=0.489$ and 0.390 , $p<0.001$ respectively. A strong correlation exists between systolic and diastolic blood pressure $r = 0.833$, $p<0.001$. A moderate correlation was also existing between pulse rate, SBP and DBP Pearson $r = 0.327$ and 0.340 , $p<0.01$ respectively. No significant correlation exists between Body mass index (BMI) and the other anthropometric indices.

Discussion

In this study, we found a high prevalence of hypertension in the Urban community of Ikom Local Government area, 37.17% using the 140/90 mmHg cut-off point, with an estimated value of 38.9% for Isolated Systolic

Hypertension and 16.8% for Isolated Diastolic Hypertension. The high prevalence may be connected to the fact that there is a rise in westernized lifestyle among the study population, increased age (seen as a risk factor of hypertension) [15,16] of the population or insufficient enlightenment about blood pressure, hypertension as a whole and its associated risk factors among the populace. Other recent studies also demonstrate an increasing pattern in the prevalence of hypertension ranging from 20.8% [17], to 23.6% [18], to as much as 44.5% [19] and 46.4% [6].

Going by this study, it is observed that the risk factors for hypertension are age and obesity measured by BMI (which is positively and also significantly associated with pulse rates and blood pressures across the population).

Conclusion and recommendation

The overall prevalence of hypertension in this study was 55.7%. In averting this threatening global epidemic of obesity and hypertension, based on the knowledge gotten from this current prevalence rate, certain measures like regular physical activity and exercise is recommended for every adult in this setting to prevent a sedentary lifestyle.

Limitation

This prevalence could not be compared in this study between both sexes because of the large gap in the number of males to females among participants. Also participant's salt intake and alcohol consumption quantity was not assessed and mean of two blood pressure measurement at sitting was used for hypertension diagnosis. These may have affected the overall prevalence.

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