

Original Research Article

Prevalence of Hypertension among Adults in Ekiti State, Nigeria

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ABSTRACT

Background: Hypertension is on the increase in Nigeria. Due to changing trends in epidemiology of hypertension and its consequences, there is need for regular surveillance on prevalence of hypertension to implement effective control strategies.

Objective: This study was designed to determine the prevalence of hypertension in Ekiti State, Nigeria; both urban and rural communities.

Methods: The study was descriptive cross sectional in design. A total of 1590 consenting adults, aged 20-70 years were recruited from six local government areas (LGAs); from each LGA, one urban and two rural communities were selected using simple random sampling. Data on socio-demographic characteristics and medical history were obtained using interviewer-administered, semi-structured questionnaire. Blood pressure (BP) was measured on three occasions using standard methods (BP < 140/90 considered normal and $\geq 140/90$ as high). Data was analysed using descriptive statistics and student t-test at $p=0.05$. Difference in means was assessed using ANOVA.

Results: Mean age of respondents was 43.9 ± 16.4 years; 44.41 ± 16.7 in the rural and 43.09 ± 15.9 in the urban; 27.8% were without formal education; 281 (29.4%) in the rural and 161 (25.4%) in the urban; 40.0% were aware of being hypertensive. Mean systolic BP (SBP) was 136.9 ± 26.5 mmHg while mean diastolic BP (DBP) was 83.9 ± 15.3 mmHg. A total of 524 (33%) had persistent BP $\geq 140/90$; 338 (35.3%) in the rural and 186 (29.4%) in the urban communities. A total of 111 (7.0%) had mild hypertension BP $\geq 140/90$ -159/99, 203 (12.8%) had moderate hypertension BP $\geq 160/100$ -179/109, while 210 (13.2%) had severe hypertension BP $\geq 180/110$.

Conclusion: Prevalence of hypertension in Ekiti State was 33%, unexpectedly higher in the rural than urban areas.

Keywords: Hypertension, Blood pressure, rural/urban hypertension.

INTRODUCTION

Universally, hypertension is a major public health problem. ⁽¹⁾ It is a threat to the health of people and a major contributor to morbidity and mortality in the Sub-Saharan Africa especially Nigeria. ⁽²⁾ In Nigeria, it's the number one risk factor for stroke, heart failure, and ischemic heart disease. ⁽²⁾ Awareness about treatment and control of hypertension is extremely low among developing nations. ⁽³⁾ By 2025, about 75% of the world hypertensive population will be

in developing countries. ⁽⁴⁾ The global prevalence of hypertension was estimated to be 26.4% (972 million) of the adult population in 2000, ⁽⁴⁾ a Population estimate of the prevalence of hypertension in the U.S population was 28.6%. ⁽⁵⁾ There were approximately 80 million adults with hypertension in sub-Saharan Africa in 2000, ⁽⁶⁾ and recent community based study of rural and semi-urban population in Enugu, Nigeria, put the prevalence of hypertension in Nigeria at 32.8%. ⁽⁷⁾

In another study the prevalence of hypertension in a Nigerian population was 21.1%.⁽⁸⁾ A 2003 study carried out in Lagos State showed that the prevalence of hypertension in the study area was 44.3%.⁽⁹⁾ Both lower incomes as well as higher income groups are at increased risk of developing hypertension.⁽¹⁰⁾

Hypertension is increasing rapidly in sub-Saharan Africa, but there are limited data on its prevalence. In addition, few population-based studies have been conducted recently in Nigeria on the prevalence and correlates of hypertension in both urban and rural communities⁽¹¹⁾ Prevalence of hypertension varies among nations and sub-populations within a nation though generally lower among high-income populations⁽¹²⁾ However, mass migration from rural to urban areas and lifestyle changes associated with “civilization” may explain the apparently rising prevalence of hypertension in urban populations. Both lower incomes as well as higher income groups are at increased risk of developing hypertension⁽¹⁰⁾ The overall prevalence of hypertension in the Federal Capital Territory (FCT)-Abuja-Nigeria was 22.7%. Hypertension was more prevalent in the urban than rural dwellers with rates of 32.7% and 12.9% respectively ($p < 0.001$) and this was attributable to obesity.⁽¹³⁾

The prevalence of hypertension is high in Nigeria, the management of the disease is expensive and its complications are severe (20.2% by⁽¹⁴⁾ and 27.9% by⁽¹⁵⁾). In Ekiti State there is paucity of data on the prevalence of hypertension. The objective of this study therefore is, to determine the population prevalence of hypertension among adults in Ekiti State, Nigeria, comparing the prevalence in the rural with urban communities.

MATERIALS AND METHODS

Study design

The study was descriptive cross sectional in design. It involved a comprehensive community survey which

defined hypertension and its prevalence in Ekiti State at the period of the study.

Study area

This study was carried out in Ekiti State, Nigeria. Ekiti State is located in the south west zone of Nigeria. It has a population figure of 2,384,212, sixteen local government areas (LGA) with Ado Ekiti as the State capital (16). The State is geographically divided into three senatorial districts; Ekiti Central, Ekiti North, and Ekiti South Senatorial District.⁽¹⁶⁾

Rural and urban communities were strictly defined by population. The population of Nigeria is predominantly rural; approximately one-third live in urban areas.⁽¹⁶⁾ The rural communities selected in this study had a population of <20,000 persons while urban communities had a population of $\geq 20,000$ persons according to National Population Census 1991.

Sample size and Sampling Strategy

A total of 1590 adults in the age group 20-70 years in Ekiti State who were willing to participate and gave their consent were included in the study. Simple random sampling technique and systematic sampling technique were employed for selecting the respondents. Two local government areas (LGA) that are representative of each of the three senatorial districts were selected using simple random sampling technique. From each selected LGA; three communities, (one urban and two rural) were selected using simple random sampling technique. In each community, houses were numbered out of which households to be studied were selected using systematic sampling technique. In each household, adults (male and female) between ages 20-70 years who gave their consent voluntarily participated in the study. The LGAs studied were; Ado, Ekiti west, Moba, Oye, Gbonyin and Ise/Orun LGAs.

Data collection technique

Data were collected via interview. Data on demographic, socio-economic characteristics, medical history, were obtained using semi-structured, interviewer administered questionnaires. Blood pressure

measurement was carried out using appropriate instruments. Ten research assistants were trained and assisted in data collection.

Blood pressure measurements

A physician and two nurses were recruited to measure blood pressure using mercury in glass sphygmomanometers (Accoson brand 300 mmHg), and stethoscope (3M™ Littmann brand). It was ensured that there was no air column in the mercury while measuring blood pressure to reduce measurement errors. To reduce observer error, standard sitting position was maintained by the physician. Blood pressure was measured on three occasions following standard techniques. Measurements were taken with subjects in a sitting position after 5 minutes of rest, with the cuff around the upper arm. For respondents with high blood pressure (BP) (persistently $\geq 140/90$ mmHg or individual on antihypertensive medication⁽¹⁷⁾) at first measurement, three consecutive measurements were made in an interval of at least 30 minutes. Mean systolic and diastolic BP were determined from the second and the third measurements. The respondents with elevated mean BP were identified as hypertensive. Normal systolic and diastolic BP was recorded as $<140/90$, mild hypertension as $\geq 140/90$ - $159/99$, moderate hypertension as $160/100$ - $179/109$, and severe hypertension as $\geq 180/110$.⁽¹⁷⁾

Data analyses

Prevalence of hypertension was determined using the Statistical Package for Social Sciences (SPSS) 16.0 version software. Data were summarized using descriptive statistics of means and standard deviations using ANOVA. Inferential statistics of independent student *t*-test was used to compare the rural urban difference in physical characteristics and blood pressure of the participants. Pearson chi square was used to test locality and gender differences in prevalence rates and the association between blood pressure and socio-demographic factors. Significant level

was set at *P* value of less than 0.05. Values were given as mean \pm SD and percentages.

Ethical consideration

Ethical clearance was obtained from the University of Ibadan/University College Hospital Ethical review committee before starting the study. Informed and written (signed) consent was obtained from each study participants. Ethical conduct was maintained during data collection and throughout the research process.

RESULTS

The results of the study were presented in Tables 1-4. The socio-demographic characteristics of respondents were presented in Table 1. The participants assessed in this study were a total of 1590, 582 (36.6%) males and 1008 (63.4%) females. The mean age of the participants was 43.88 ± 16.4 years. Respondents within the age groups 50 and 70 years were 406 (63.2%) in the rural and 246 (38.3%) in the urban communities. The participants were predominantly Yorubas. A total of 288 (30.1%) of the participants in the rural and 134 (21.2%) in urban communities took alcohol.

Prevalence of hypertension was presented in Tables 2-4. The result of the blood pressure assessment showed that 524 (33.0%) participants had high blood pressure; 111 (7.0%) had mild hypertension, 203 (12.8%) had moderate hypertension, while 210 (13.2%) had severe hypertension. The prevalence of hypertension in Ekiti State was 524/1590 (33.0%): 338/957 (35.3%) in the rural and 186/633 (29.4%) in the urban. Among the 524 participants found to have high blood pressure 214 (40.8%): 81 (24.0%) in rural and 133 (71.5%) in urban communities ($p < 0.05$) were aware that they have the disease. Out of the 214 (40.8%) participants that were aware of their blood pressure status only 40 (18.7%) were on regular medication, 138 (64.5%) had family history of hypertension, and 177 (82.7%) had their blood pressure controlled.

Table 1: Socio-demographic characteristics of respondents by locations

Characteristics	Rural (n=957) n (%)	Urban (n=633) n (%)	Total (n=1590) n (%)	p
Age (years)	44.41±16.7	43.09±15.9	44.0 ±16.4	>0.05
Sex				<0.05
Male	359(37.5)	223(13.7)	582(36.6)	
Female	598(62.5)	410(64.8)	1008 (63.4)	
Marital Status				<0.05
Single	148(15.5)	106(16.7)	254 (16.0)	
Married	703(73.5)	471(74.4)	1174 (73.8)	
Divorce	4(0.4)	4(0.6)	8(0.5)	
Separated	18(1.9)	16(2.5)	34 (2.1)	
Widowed	84(8.8)	36 (5.7)	120 (7.5)	
Occupation				<0.05
Farmer	215(22.5)	87(13.7)	302(19.0)	
Civil servant	46(4.8)	30(4.7)	76(4.8)	
Trader	364(38.1)	310(49.0)	674 (42.4)	
Self employed	181(18.9)	124(19.6)	305(19.2)	
Student	88(9.2)	56(8.8)	144(9.1)	
Retired officer	9(1.5)	6(0.6)	15(0.9)	
Unemployed	53(5.5)	21(3.3)	74(4.7)	
Highest educational attainment				<0.05
Noformal education	281(29.4)	161(25.4)	442(27.8)	
Primary education	228(23.8)	154(24.3)	382(24.0)	
Secondary education	311(32.5)	230(36.3)	541(34.0)	
Tertiary education	137(14.3)	88(13.9)	225(14.2)	
Monthly household income				<0.05
<₦10,000	610(63.7)	379(59.9)	989(62.2)	
₦ 10,000–₦ 20,000	195(20.4)	144(22.7)	339(21.3)	
₦ 21,000–₦ 30,000	83(8.7)	46(7.3)	129(8.1)	
₦ 31,000–₦ 40,000	29(3.0)	41(6.5)	70(4.4)	
≥ ₦41,000	40(4.2)	23(3.6)	63(4.0)	

Table 2: Prevalence of hypertension by gender

Blood pressure Classification	Male (n=582) n (%)	Female (n=1008) n (%)	Total (n=1590) n (%)	p
Normal BP ≤139/89	404(69.4)	662(65.7)	1066(67.0)	<0.05
Mild (HBP)140/90-159/99	43(7.4)	68(6.7)	111(7.0)	<0.05
Moderate (HPB)160/100-179/109	80(13.7)	123(12.2)	203(12.8)	<0.05
Severe (HBP)>180/110	55(9.5)	155(15.4)	210(13.2)	<0.05
SBP				
<140	402(69.1)	661(65.6)	1063(66.9)	<0.05
≥140	180(30.9)	347(34.4)	527(33.2)	<0.05
DBP				
<90	321(55.2)	567(56.2)	888(55.9)	<0.05
≥90	261(44.8)	441(43.7)	702(44.2)	<0.05

*Total number of hypertensive (BP≥140/90) = 524 (33.0%) of the total population (1590) screened

Table 3: Blood pressure measurement in the rural and urban communities

Characteristics	Rural n=957	Urban n=633	F	Df	p-value
Blood Pressure (mmHg)					
SBP (mean±SD)	138.01±26.8	135.10±26.0	4.8	1	<0.05
DBP(mean±SD)	84.52±15.52	82.94±14.84	4.3	1	<0.05
Blood Pressure Classification (n (%))	619(64.7)	447(70.6)			<0.05
Normal BP ≤139/89					
Mild hypertension 140/90-159/99	77(8.0)	34(5.4)			
Moderate hypertension 160/100-179/109	22(12.8)	81(12.8)			
Severe hypertension >180/110	139(14.5)	71(11.2)			

Table 4: Prevalence of hypertension in the rural and urban locations by LGA

Local Government Area	Rural n (%)	Urban n (%)	Total
Ado	33(3.5)	8(2.8)	51(20.3)
Ekiti West	31(3.2)	38(6.0)	69(27.3)
Gbonyin	55(5.8)	16(2.5%)	71(25.1)
Ise/Orun	62(6.5)	39(6.2)	101(41.1)
Oye	93(9.7)	48(7.6)	141(51.1)
Moba	57(6.0)	34(5.4)	91(32.4)
Total	338(35.3)	186(29.4)	524(33.0)

*Note: Out of the 957 participants assessed in the rural communities 338 (35.3%) had high blood pressure while 186

(29.4%) had high blood pressure out of the 633 participants assessed in the urban communities.

DISCUSSION

The result of this study showed a high prevalence (33.0%) of hypertension in the population studied whose mean age ±SD was 43.88±16.40 years. This prevalence is high and may be considered as a major public health problem in the study area. (18)

This prevalence was much higher than the prevalence obtained from the study conducted by ⁽⁹⁾ in Portharcourt which showed that the prevalence of hypertension in the study area was 21.3%, It was within the range of the prevalence recorded by ⁽²⁾ which showed that prevalence of hypertension in Nigeria ranges from 8.0%-46.4%. A total of 40.1% of the hypertensive had severe hypertension which was higher than that reported by. ⁽¹⁹⁾ Females had higher prevalence of high BP than men in this study. This is similar to the findings in a study by ⁽²⁰⁾ but against the findings of ⁽⁹⁾ which showed that men had higher prevalence of high BP compared to women.

As many studies observed, there is a positive association between age and hypertension. ⁽¹⁰⁾ This is mainly due to arterial stiffness as one gets older. ⁽¹⁰⁾ Similarly, hypertension increases with age in this study. Systolic and diastolic BP was highest among participants aged 60 to 70 years and lowest among 20-29 years. This is also similar to the findings by ⁽²¹⁾ which showed that systolic and diastolic BP increased with age in both men and women.

In this study, the prevalence of hypertension was found to be more among the retired personnel and farmers. This is similar to the work of. ⁽¹⁹⁾ This study demonstrated that both education and income were associated with BP progression, but only education was significantly related to incident hypertension. This is similar to a study by ⁽¹⁹⁾ which showed that those with less than a high school education had a higher prevalence of hypertension compared with those with higher educational attainment. Prevalence of hypertension was higher among the low income than the high income respondents in this study. This corroborates the findings in a study ⁽¹⁹⁾ which showed a higher hypertension prevalence rate among low-income older adults.

There was low awareness of hypertension status (40.8%) among participants with hypertension in this study. This was similar to the findings in a study ⁽²⁾

which showed that awareness, treatment and control of hypertension were generally low. The level of awareness of hypertension was lower in the rural (24.0%) than urban (71.5%) communities. It was also higher among females than males, similar to the work of. ⁽²²⁾

The prevalence of hypertension was higher in the rural (64.5%) than urban (35.5%) communities in the study area. This was similar to the study carried out in a rural area, Aaye Ekiti which showed that hypertension was present in 66.4% of the participants assessed. ⁽²³⁾ It was against a report ⁽⁹⁾ which showed that hypertension prevalence of 44.3% was recorded in urban Lagos, while the prevalence in rural communities in Rivers State was 27.9%. The higher prevalence of hypertension recorded in the rural communities of our study might be as a result of the following; respondents within the age groups 50 and 70 years had highest hypertension prevalence, and were more in rural (63.2%) than urban (38.3%) communities. Awareness of hypertension status was lower in rural (24.0%) than urban (71.5%) communities. Also there was higher percentage of farmers and retired officers in the rural than the urban communities. Participants with no formal education were mostly found in rural communities. Many people took alcohol regularly especially locally brewed dry gin (*ogogoro*) 288(30.1%) in the rural than 134 (21.2%) urban communities.

CONCLUSION AND RECOMMENDATION

Hypertension prevalence in Ekiti State was found to be 33% higher in the rural than the urban areas of the State. This prevalence is high and may be considered as a major public health problem in the study area. Hypertension is an emerging challenge in rural areas of the state. Awareness, treatment and control of hypertension were generally low with attendant high burden of hypertension in the study area. This may be because the participants do not assess the health care services in their communities

regularly. The high prevalence of hypertension in this study area suggests a high risk of a future cardiovascular event.

The results of the study on prevalence of hypertension in Ekiti State showed a poor detection, treatment and control of hypertension. Further epidemiological studies on hypertension are required to adequately understand and characterize the impact of hypertension in the society. Public Health promotion programs and re-orientation of primary health care are needed to improve hypertension detection, awareness, prevention and management in Ekiti State. Estimating the prevalence of hypertension in populations of Nigeria would be useful in efforts to control hypertension and prevent its consequences.

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