

ORIGINAL ARTICLE
HYPERTENSION PREVALENCE IN NIGERIAN WOMEN:
AN OPPORTUNISTIC SCREENING EXERCISE IN A
NIGERIAN URBAN CENTRE

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ABSTRACT

BACKGROUND: Hypertension is a major risk factor for cardiovascular morbidity and mortality worldwide and is worse in black women. It is necessary to target this high-risk population during occasions such as hypertension survey provided by the May Measurement Month.

Objectives: To determine the prevalence and awareness of hypertension in women during a screening exercise for hypertension.

METHODS: A hypertension survey was conducted during the 2018 May Measurement Month on a group of women attending a church program. The demographics and details regarding prior knowledge of hypertension, co-morbid conditions and previous treatment as applicable were sought. Blood pressure (BP) was measured three times and an average of the 2nd and 3rd reading taken as the blood pressure. Hypertension was defined as systolic blood pressure (SBP) \geq 140mmHg or diastolic blood pressure (DBP) \geq 90mmHg or being on treatment for hypertension. Data was analysed using descriptive measures.

RESULTS: A total of 220 women participated in the survey. The mean age (SD) of the participants was 60.1(12.1) years with an age range of 21-95 years. Twenty-two (10.0%) participants had never checked their BP before the survey. The mean SBP was highest in those aged 60 and above and this was significant ($p < 0.001$). One hundred and fifty (68.2%) of the participants had hypertension, However, the participants who were aware of a previous diagnosis of hypertension were 99 (45%); 75(34.1%) were already on medications while 45(20.5 %) were diagnosed as having hypertension on the day of the screening exercise.

Conclusion: This study showed high prevalence, low awareness and treatment rate of hypertension among a female population. More attention should be paid towards enlightening Nigerian women about hypertension screening and treatment.

KEYWORDS: hypertension; blood pressure; women; screening; Nigeria

INTRODUCTION

Head disease is one of the leading cause of death in women around the world.¹ Hypertension is a notable and a major contributor to the increasing prevalence of cardiovascular disorders and death worldwide.² The complications of hypertension has been shown to be worse in blacks and in women.³ Furthermore, untreated asymptomatic Nigerian hypertensives have also been shown to have target organ damage at presentation.⁴ Lack of awareness, late diagnosis and treatment as well as insufficient control has also been shown to be contributory to the morbidities and mortalities associated with hypertension.³

Nigeria is essentially a homogenous black population and a recent systematic analysis found the prevalence of hypertension in Nigeria to be about 30.6% (27.3-34.0%) and an overall prevalence of 30.4% (25.2-35.6%) in women.⁵ It has been also shown that urban dwelling adults have a higher prevalence of hypertension more so in women.⁶

The development of hypertension in women has been shown to be higher in older women than younger women especially in low to middle income countries.³ Postmenopausal women also have a higher prevalence of hypertension, which may be attributed to the loss of estrogen and other physiologic changes that accompany menopause.⁷ It has been shown that there appears to be an increased systolic blood pressure probably from increased arterial stiffness. They are also prone to depression and anxiety that may encourage weight gain and worsen their hypertension status. In younger women, the use of oral contraceptive medications and pregnancy have been associated with the development of hypertension.³ These factors are peculiar to hypertension in women and emphasize the need to actively identify women with

hypertension.^{8,9}

In Nigeria, obesity has been identified as a potential risk factor for hypertension^{10,11}. This may be worse in post-menopausal women who may have low physical activity levels.^{12,13} Increasing maternal age and elevated body mass index were also recognized as possible predictors of persistent hypertension in Nigerian women who had hypertension in pregnancy.¹⁴

Although women may be more aware of their blood pressure state than men and have higher treatment and control rates in developed nations, the situation is likely to be different in the low to middle income countries.¹⁵ Awareness has also been shown to be lower in younger women than men while different risk factors such as increased body mass index, smoking and tobacco use as well as low physical activity may predispose to or worsen hypertension. However, while the treatment outcomes in various randomized control trials (RCT) show that there is benefit in lowering blood pressure, there appears to be no significant difference between men and women.¹

For appropriate and adequate reduction in hypertension-related morbidities in women, it is important for women to be regularly aware of their blood pressure status, and if on therapy to have their blood pressure controlled. There are few studies that have focused on screening women for hypertension and with the theme of the International May Measurement Month (MMM) 2018 that encouraged clients to know their blood pressure values and raise awareness about hypertension, we decided to utilize this opportunistic screening exercise to evaluate the awareness, treatment and possible control rates of women in an urban area in Nigeria.

METHODS

Study design and site

This was a cross-sectional opportunistic community survey that was part of the 2018 MMM program promoted by the International Society for Hypertension and supported by the Nigerian Hypertension Society. This screening program took place in a church setting in an urban area of Edo state, Nigeria. Benin-city is the capital of Edo state and has a population of about 3 million.

Study participants

All female adults aged 18 and above present at the venue of the church program were invited to participate in the study. Written informed consent was obtained from all participants before participation. Convenience sampling of consenting participants was carried out.

Resident doctors and other volunteer staff were trained using a face to face training on how to measure blood pressure, weight and height. They were also trained on administering the questionnaire in the MMM protocol.¹⁶

Procedure:

Booths had been set up outside the church hall, where participants had their heights measured using a stadiometer to the nearest 0.1cm after asking them to remove their shoes and weight measured using a standard weighing scale. Body mass index (BMI) was calculated by dividing the weight (in kg) by the square of the height in meters. The BMI (kg/m^2) was then classified as underweight (18.5), normal (18.5-24.9), overweight (25- 29.9), and obese (≥ 30)¹⁷. Thereafter trained volunteers collected information from the participants on their demographics, medical history, social habits and use of antihypertensive medications as detailed in the MMM protocol¹⁶. Blood pressure was then measured using the upper arm of one

arm with the cuff placed at heart level and the patient sitting comfortably. A total of three consecutive readings with a one minute interval between measurements was obtained for each participant. Validated upper-arm automated blood pressure monitoring devices as well as non-automated mercury sphygmomanometers were used to measure the blood pressure, taking the 1st and 5th Korotkoff sounds as systolic and diastolic BP respectively according to the MMM protocol.¹⁶ A health talk was delivered to the participants regarding their health status and those who needed referral were given. Data was collected using the MMM pre-designed interviewer administered questionnaire from the International Society for Hypertension (ISH).

An average of the last two readings was analysed and hypertension was defined as systolic blood pressure $\geq 140\text{mmHg}$ and or diastolic blood pressure $\geq 90\text{mmHg}$ and or those who reported that they were using drugs for hypertension. Blood pressure was said to be controlled if BP was below 140/90mmHg.¹⁶

Ethical Considerations

This study was approved by the National Health Research Ethics Committee of Nigeria (NHREC/01/01/2007 on the 16th of April, 2018. The Medical Women Association of Nigeria (MWAN) Edo state chapter had contacted a church holding a women's conference in May 2018. All attendees were encouraged to participate in the screening exercise. Informed consent was obtained from each participant. The data was uploaded unto the MMM site but later informed that the site/server crashed and data was not captured into the National data.¹⁸

RESULTS

Characteristics of the study population

There was a total of 220 female participants in the study. The mean age (SD) of the participants was 60.1(12.1) years with age ranging from 21-95 years. There were more persons aged 60 and above in the study 112(50.9%). They were all of the black race (100%). The mean body mass index (BMI)(SD) was 27.2(8.4) kg/m². Twenty-two (10%) had diabetes mellitus, 6(2.7%) were using tobacco, only 3(1.4%) used alcohol more than once a month and 2(0.9%) were pregnant. Only 2(0.9%) and 3(1.4%) had a previous history of stroke and heart attack respectively. Among the participants, 22(10%) had never checked their blood pressure before the screening while a majority 159(72.3%) had checked their BP in the 12 months preceding the survey. (Table 1)

Table 1: Demographic and Clinical Characteristics of the Study Participants

Characteristics	n=220(%)
Age groups(years)	
21-39	14 (6.4)
40-59	94 (42.7)
>60	112(50.9)
BMI(kg/m ²)	
Underweight	1 (0.5)
Normal	60 (27.3)
Overweight	69 (31.4)
Obese	79 (35.9)
Missing	11(5.0)
Tobacco Use	
Never	214 (97.3)
Yes	6 (2.7)
Alcohol intake	
Yes	3 (1.4)
No	217 (98.6)
Presence of Diabetes Mellitus	
Yes	22 (10.0)
No	198 (90.0)
Previous Heart Attack	
Yes	3 (1.4)
No	217 (98.6)
Previous Stroke	
Yes	2 (0.9)
No	218 (99.1)
Fasting Presently	
Yes	95 (43.2)
No	125 (56.8)

Presently pregnant	
Yes	2(0.9)
No	218(99.1)
Previous BP measurement	
Never	22 (10.0)
Over 12 months	39 (17.7)
Within the last 12 months	159 (72.3)

An electronic blood pressure monitor was used in 187(85.0%) of the participants and a mercury sphygmomanometer in 15%. The mean systolic blood pressure (SBP) was 139.0(23.4) mmHg while mean diastolic blood pressure (DBP) was 81.9(12.7) mmHg. The mean SBP was highest in those aged 60 and above 144.5(22.6) mmHg and this was significant as demonstrated by one-way ANOVA (F=10.0, p= <0.001). There was no significant difference between age groups and diastolic blood pressure. (Table 2.)

Table 2: Relationship between the blood pressure reading and the age groups of study participants

	All	21-40 Years	41-59 years	≥60 years	F*	P value
Mean SBP (SD) (mmHg)	139.0(23.4)	119.2(20.4)	135.4(22.6)	144.5 (22.6)	10.007	<0.001
Mean DBP (SD) (mmHg)	81.9(12.7)	78.8(12.8)	82.2(12.7)	82.1(12.7)	0.471	0.625

SBP- Systolic Blood Pressure. DBP- Diastolic Blood Pressure, F* One-Way Anova

Prevalence of hypertension

The prevalence of hypertension in the participants was 150 out of 220 participants (68.2%) and this was highest in those older than 60years of age, 92 (61.3%) which was significant (p=<0.001). There were no significant association between the demographic and clinical characteristics and having a hypertension diagnosis. (Table 3) There was no statistical difference between the mean BMI of those who had hypertension vs those who did not have. (Table 3)

Table 3: Associations between demographic and clinical characteristics and hypertension among study participants

Characteristics	Hypertensive on day screening n= 150(%)	Not of Hypertensive on day of screening n= 70(%)	Chi square/ Fishers Exact test**/ ANOVA	p value
Age groups(years)				
21-39	3(2.0)	11(15.7)	28.221*	<0.001
40-59	55(36.7)	39(55.7)		
>60	92(61.3)	20(28.6)		
Mean BMI(kg/m²)	27.5(8.8)	26.6(7.2)	0.766***	0.382
Tobacco Use				
Never	145(96.7)	69(98.6)	0.653**	0.667
Yes	5(3.3)	1(1.4)		
Alcohol intake				
Yes	2(1.3)	1(1.4)	0.003**	1.000
No	148(98.7)	69(98.6)		
Presence of Diabetes Mellitus				
Yes	16(10.7)	6(8.6)	0.233*	0.629
No	134(89.3)	64(91.4)		
Previous Heart Attack				
Yes	2(1.3)	1(1.4)	0.003**	1.000
No	148(98.7)	69(98.6)		
Previous Stroke				
Yes	2(1.3)	0 (0)	0.942**	1.000
No	148(98.7)	70(100)		

BMI: Body Mass Index, ***Chi-square, ** Fishers exact test computed, ***ANOVA

Awareness and treatment of hypertension

In the hypertensive patients (n= 150), the participants who were aware of a previous diagnosis of hypertension or already on medications were 105(70%) while 45(30%) were diagnosed as having hypertension on the day of the screening exercise (unaware). Ninety-nine (45%) of the participants had been previously diagnosed as having hypertension, of which 69(69.7%) were using antihypertensive medicines. Further, there were 6(6.1%) patients of those who had reported that they had not received a prior diagnosis of hypertension but admitted to using antihypertensive medicines. Of the total study participants, 75/220(34.1%) were on antihypertensive medications. In treated hypertensives on medications (n=75), blood pressure was controlled in 35 (46.7%) see table 4. Of the 105 previously diagnosed hypertensives, 43 (40.9%) were controlled.

Table 4: Prevalence of hypertension treatment and control

Total participants	Prevalence of hypertension n/220(%)	Proportion of hypertensives who are aware n/150(%)	Proportion of hypertensives who are aware and on medications n/105(%)	Proportion of hypertensives on medication with controlled BP n/75(%)
220	150(68.2)	105(70)	75(71.4)	35(46.7%)

DISCUSSION

This study has revealed a high prevalence of hypertension (68.2%) in women living in an urban area of Nigeria. This was similar to the findings from a prevalence study in semi-urban South-western Nigeria where the prevalence in women was shown to be 60.7%.¹⁹ Our findings were however, higher than those seen in other studies conducted in urban areas which had prevalence rates of hypertension in women ranging from 51.9 to 53.1%.^{6,20} It was also higher than what was found in a systematic analysis of hypertension prevalence in Nigeria which had a prevalence rate of 30.4% in women.⁵ The higher findings in our survey may be ascribed to the urban setting of the survey as shown in other studies where hypertension prevalence was higher in urban centres^{5,21,22}. This finding may also be alluded to an increased westernized diet and a more sedentary lifestyle in urban settings over a rural agrarian lifestyle. It could also be because only women were included in this survey as seen in the study by Bello-Ovosi et al which also had a higher female preponderance²⁰. Furthermore, a previous survey in the same state had also shown a high prevalence of hypertension in women compared with men²³.

This study showed that majority of the population 97.3% claimed they were not using tobacco which increases the risk of coronary arterial disease by 25%.³ However, a large proportion were overweight or obese, 148

(67.3%) which could be a result of poor exercise and dietary control. This proportion of overweight /obese individuals is higher than what obtained in another study by Ajayi et al²⁵ which had 42.8% of the study population as obese/overweight but similar to a study conducted in an urban centre that showed females with hypertension having a higher BMI.⁶ These may contribute to a poor control of blood pressure and may adversely contribute to the development of cardiovascular morbidity. Again, obesity has a greater impact in women than men as shown in the Framingham heart study where obesity increased the risk of coronary arterial disease by 64% in women compared to 46% in men.²⁶ The study also showed a relationship between increasing age and elevated blood pressure especially systolic blood pressure which was higher in those aged 60 and above (61.3%). A similar finding was noted in a South Korean study²⁷ which noted that, after the age of 60 years, hypertension was more prevalent in females than in males (51.3% vs 49.8%) and regardless of gender, the older the participants were, the more likely they were to have hypertension. Hypertension has been demonstrated in observational studies to occur more in post-menopausal women probably due to loss of endogenous estrogens.²⁸ This is also in concordance with the trend seen with the 2017 Nationwide survey which had a hypertension prevalence of 63% in those aged 70 years and above.²⁹

It may therefore be necessary to screen elderly women more frequently to avoid complications of hypertension that may accompany a normal ageing process.

The need for frequent screening is highly needed as up to 10% of the study participants had never been screened prior to the exercise, also a good proportion had not checked their blood pressure values in over 12 months prior to the study. There is need to increase awareness on the importance of frequent blood pressures checks at any age³⁰ and most especially in older women. Another study had also shown a high proportion (14.2%) of the hypertensive participants who had never checked their blood pressures.²⁹

This study also revealed that while a greater proportion of participants in this study did not report complications of hypertension such as stroke and heart attacks, the very few who did were hypertensive as seen in the national study.¹⁸ This again reiterates the need for routine care and visits to ensure that patients are well educated about hypertension complications.

The prevalence of diabetes mellitus is on the increase in Nigeria though only a small proportion of the participants reported that they had diabetes mellitus. Diabetes mellitus is a known poor prognostic index for patients with hypertension.³¹ Also notable was that majority of the participants with diabetes mellitus had hypertension. This does not portend well for the cardiovascular status of the participants as a tighter control is needed for those with diabetes mellitus. This co-existence of diabetes mellitus and hypertension has also been shown in another community survey where the prevalence was 6.7%.²⁰

We noted that while 105(70%) of the participants with hypertension in this

screening exercise were either aware or on medications, only 99(45%) were aware they had hypertension and even fewer were on medications. This study also identified that few persons with a previous diagnosis of hypertension or already on antihypertensive medications had blood pressure levels that were controlled. Lack of adequate knowledge about hypertension may have adverse implications on the participants' well-being. This may include development of complications, having increased risk of drug-drug interactions and other adverse effects that could have been averted if the participants were aware of their diagnosis of hypertension. It is hoped that women will pay more attention to medical consultations. Also, physicians must engage patients and in particular women on disease conditions, diagnosis and treatment options. It is possible that some of the patients who reported that they were not using medicines were on lifestyle management.

It is very important to emphasize the need for control of blood pressure by encouraging the patients to adhere to lifestyle modifications, use of antihypertensive medications as well as routine clinic visits. Studies have shown that the inadequate knowledge of hypertension and long duration between clinic visits are associated with poor control of blood pressure.^{32,33}

There is a need to address other women-related factors which could impact on the blood pressure control. These may include previous hypertension in pregnancy, family stressors, the higher risk of hypertension and related morbidity in black women and the tendency to experience more adverse effects.³ These impact on care of the hypertensive black female patient and must be part of the routine

clinic care offered to the patients. However, the questionnaire was not designed to evaluate that. Subsequent MMM (2019 and 2020) questionnaires have been modified to detect the use of specific medications and lifestyle measures that may be beneficial.

CONCLUSION

There was a high prevalence of hypertension in this select population, affecting mostly the older women at this screening exercise. Awareness of hypertension was poor and there was poor control of blood pressure in those with knowledge of pre-existing hypertension. In all, there is need to carry out more intensive surveys in women to detect hypertension as well as ensure adequate control. Older women who may be at a higher risk may require more frequent blood pressure checks to detect elevated blood pressure early to prevent complications and reduce attendant morbidities and mortalities.

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