

Prevalence of Hypertension in relation to Overweight and Obesity among Non-teaching staff of College of Medicine, University of Ibadan, Oyo State

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Abstract

Hypertension and overweight/obesity prevalence are associated with high rates of morbidity and mortality which has become a vital public health concern worldwide. Among many studies conducted on hypertension prevalence, there is paucity of data on this subject among workers in the hospital environment. This study thus centered on determining the prevalence of hypertension among non-teaching staff of the College of Medicine, University of Ibadan (CoMUI).

A sum of 315 non-teaching staff of CoMUI on the University College Hospital premises participated in the survey. Blood Pressure (BP) was determined as specified in the ESH/WHO guidelines. BMI was assessed using a known-weight standardized weighing scale and heightometer. Data were analyzed using SPSS. Descriptive statistics, Chi-square and logistic regression were considered.

Hypertension prevalence among respondents was 25.4% (68.8% male; 31.3% female). For the male respondents, the mean SBP was 132.2±19.0mmHg and it was significantly higher than that of the females 124.5±17.8mmHg (t = 3.63, p < 0.05). Also, the mean DBP of the male respondents (86.04±11.19) was significantly higher than females (80.95±11.62), t = 3.92, p < 0.05. Prevalence of overweight and obesity was 33.1% and 20.3%. Age group of 21-30 years and 31-40years are three times and two times less likely to develop hypertension than those within the age group of 51-60 years (O. R=0.361(3x) and 0.467(2x); 95% CI=0.137-0.951 and 0.219-0.995) see table 6.0.

Prevalence of 25.2% indicated that one quarter of the non-teaching staffs of College of Medicine working within the University College Hospital are hypertensive. This suggests an urgent intervention to avoid resulting complications.

Keywords: Hypertension, Hypertension prevalence, Body Mass Index (BMI), Hospital environment, Obesity, Overweight.

Introduction

High blood pressure which is also known as hypertension results from environmental impacts acting over time on the genetically predisposed individual (Pickering, 1967). Hypertension is recognized as a silent killer, as it damages the target organs on a continuous and progressive basis until symptoms are manifested (Hoel and Howard, 1997). In adult, blood pressure is generally agreed to be high when the systolic pressure is equal to or greater than 140mmHg and diastolic pressure is equal to or greater than 95mmHg (World Health Organization/International Society of Hypertension,1999). The rate of Mortality and morbidity caused by hypertension on families and the society at large is so overwhelming. Apart from being a disease on its own, it is also a major risk However it remains inadequately managed everywhere (Godley, *et al* 2001). factor for stroke and heart diseases Hypertension is recognized as a silent killer due to the damages it causes on the target organs on a continuous and progressive basis until symptoms are manifested (Macmillian, Peto and Cutler, 1990). Population-based studies have shown that hypertension accounts for about 35% of all events relating to atherosclerotic, including 49% heart failure and related cases. It increases two- to three times in an individual risk of various cardiovascular consequences (Padwal, Strauss and McAlister, 2001).

There have been many studies and projections on hypertension prevalence and its related complications globally and in many nations of the world. It was calculated, chronic diseases contributed about 60% of the 56.5 million total reported deaths in the world in 2001 and roughly 46%



of the burden of disease globally (World Health Organization, 2002). Also, it has been projected that chronic diseases will account for almost three-quarters of all deaths worldwide by 2020 and 75% of deaths from stroke, and 70% of deaths from diabetes will occur in developing countries (World Health Organization, 1998). Most of these chronic diseases have their roots on hypertension. Also, data from South Africa shows that the burden of non-communicable diseases, mostly cardiovascular diseases, including stroke, caused by hypertension, is greatly increasing among the urban Black African populace (Bradshaw, Groenewald et al, 2000). Worldwide, Hypertension is increasingly becoming a common health problem due to increase in longevity and prevalence of associated risk factors (Yusuf, et al 2001). In many developing countries particularly in urban societies, the current prevalence is already as high as those recorded in developed countries (Vorster, 2002). In 2002, hypertension was estimated to account for 13% of deaths worldwide (WHO Report, 2002). The estimated total number of adults with hypertension in 2000 was 972 million. Of these, 333 million were estimated to be in economically developed countries and 639 million in economically developing countries. By 2025, the number of people with hypertension will increase by about 60% to a total of 1.56 billion as the proportion of elderly people will increase significantly (Kearney et al, 2005).

In Nigeria, a study conducted in 1997 estimated that over 4.3 million Nigerians above the age of 15years were hypertensive with systolic blood pressure of 160 mmHg and above, and/or a diastolic of95 mmHg and above⁵. In 2010, another study estimated about 20.8million cases of hypertension in Nigeria among people aged at least 20years with a prevalence of 28.0%. It was also estimated that by 2030, the cases of hypertension among age 20years in Nigeria will increase to 39.1million having prevalence of 30.8%. Also, in Nigeria, the prevalence of hypertension ranged from17-20% in the urban communities and 11.2% in the rural communities. A worksite study on prevalence of hypertension which was conducted among non-academic staffs in Obafemi Awolowo University, Ile-Ife, Nigeria, revealed a prevalence of 21% (Erhun, *et al* 2005).

Though the exact causes of hypertension are not usually known, a number of factors have been highly associated with the condition. These include: Smoking, obesity or being overweight, sedentary lifestyle, lack of physical activity, diabetics, high levels of salt intake (sodium sensitivity), Vitamin D deficiency, aging, Insufficient consumption of potassium, calcium, and magnesium, stress, high levels of alcohol consumption, high consumption of medicines including birth control pills, as well as family history of hypertension, , adrenal, chronic kidney diseases and thyroid problems or tumours (Mabuza, 2006).

However, a range of lifestyle changes has been shown in clinical trials to bring low blood pressure (Ebrahim and Smith, 1998) and to reduce the occurrence of hypertension (Stevens, *et al* 2001). These include loss of weight in overweight, physical activity (Hagberg, Park and Brown, 2000), reduced alcohol intake (Xin, *et al*, 2001), a diet rich in fresh fruits and vegetables as well as less of saturated fat food content and reduced dietary sodium intake (Sacks *et al* 2001).

It is quite clear that hypertension is a major public health problem in Sub-Saharan African countries, particularly in Nigeria. Levels of its detection treatment and control are very low and of great concern, suggesting that high levels of adverse effects including heart failure, stroke, and renal failure will become obvious in the years to come.

Due to the symptomless nature of hypertension, the proportion of people in any given population who are aware of their blood pressure is usually low not minding their locations¹⁰.

Sequel to this problem, this study was conducted to screen for hypertension as well as determine blood pressure pattern among hospital – based workers in Ibadan, Oyo State.

Objectives of the study

- 1. To determine the prevalence of hypertension among non-teaching staff of college of medicine Ibadan Oyo State
- 2. Determine prevalence of overweight/obesity among non-teaching staff of college of medicine Ibadan Oyo State
- 3. To determine the relationship between gender and prevalence of hypertension among nonteaching staff of college of medicine Ibadan Oyo State

4. Determine the relationship between prevalence of hypertension and overweight/ obesity among non-teaching staff of college of medicine Ibadan Oyo State

Methodology

Study area

College of Medicine of the University College Hospital where this study was conducted is situated in Ibadan North Local Government Area of Oyo State, Nigeria. Being one of the pioneer institutions in Nigeria which was instituted on November 17th, 1948, the University existed originally as an independent external college of the University of London. College of Medicine as an arm of the University has 476 Non-Teaching Staff distributed within 44 departments. One of the departments is situated in Ibarapa community, 36 departments are located at the University College Hospital while 7 departments are at the main campus. The conduct of this study was limited to the non-teaching staff in the 36 departments located in College of Medicine.

Study population

The study population was comprised of non-teaching Staff in University College Hospital environment who are working in different department of the College of Medicine Ibadan.

Sampling method

The sampling method used for this study was purposive.

Sample size

Three hundred and fifteen (315) non-teaching staff was involved in the study being the total number of the entire staff of the College of Medicine, University College Hospital. As such, sample size calculation was not necessary.

Study tools

Semi-structured questionnaire was used after it was pretested among population with similar characteristics with the study population

Collection of data

The semi-structured questionnaires which was validated were self-administered with the help of two trained nurses who also helped in checking the blood pressure of the respondents.

Measurement of blood pressure

Measurement of blood pressure was done using Accoson mercury sphygmomanometer. The measurement was conducted in the staff respective offices. It began after the subject had rested for at least 5 minutes. The patients were seated in a comfortable chair with their backs supported and arms bared and supported at heart level. An appropriate adult cuff size was used to ensure accurate measurement. The cuff was inflated to 30 mmHg above pulse occlusion. The systolic blood pressure was recorded at the first appearance of a sound and the diastolic blood pressure was recorded at the sound. Blood pressure was measured twice at two minutes intervals and if the readings differed by more than 5 mmHg, an additional reading was taken. Hypertension was diagnosed based on the laid down criteria by the World Health Organization -International Society for Hypertension (1999). A Patient was labelled hypertensive if an average of three readings showed the systolic blood pressure to be 140 mmHg or greater and the diastolic blood pressure to be 90 mmHg or greater (World Health Organization -International Society for Hypertension, 1999).

Height measurement

Respondents' height was measured with a measuring tape. Individual standing erects with the back against the wall and with the shoes removed. The measurement was recorded in meters to two decimal points.

Weight measurement

Respondents' body weight was measured using simple bathroom scale which was standardized using a known weight. Placing the scale on a firm horizontal surface, the weight of each subject was measured with shoes removed and was recorded in kilometers to one decimal point. The pointer of the scale was adjusted to zero before and after each measurement to avoid error.

Categories	SBP (mmHg)	DBP (mmHg)
Optimal	<120	<80
Normal	<130	<85
High normal	130-139	85-89
Mild (grade 1)	140-159	90-99
Moderate (grade 2)	160-179	100-109
Severe (grade 3)	>180	>110

Fable 1. Blood	pressure	measurement
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Source: World health organization/ international society for hypertension (1999).

Data analysis: Analysis of the collated information followed the process of numbering of questionnaire, coding the information, data entering and analysing using Statistical Package for Social Sciences (SPSS) software. The differences were considered significant at p less than or equal to 0.05. Multiple logistic regression analysis was used to check the correlates of hypertension.

Results

Socio-demographic characteristics of the respondents

Findings from the survey show that ages of respondents ranged from 20 to 60 years with a mean age of 42.8 ± 13.2 years. Majority 285 (90.5%) of the respondents were of Yoruba ethnic group. Details are shown in Table 2.0 and figure 1.0.

Variable	Number	Percentage (%)	
Sex			
Male	184	58.4	
Female	131	41.6	
Total	315	100.0	
Educational Qualification			
Primary education	20	6.3	
Secondary education	63	20.0	
Tertiary education	232	73.7	
Total	315	100.0	
Marital status			
Single	58	18.4	
Married	250	79.4	
Divorced	2	0.6	
Widow/Widower	5	1.6	
Total	315	100.0	
Religion			
Christianity	266	84.4	
Islam	49	15.6	
Total	315	100.0	
Administrative rank	187		
Senior	28	59.4 8.9	
Intermediate staff	100	31.7	
Junior staff	315	100.0	

Table 2. Education, marital status, religion and ethnic group



Figure 1. Age distribution of the respondents

Prevalence of hypertension among the respondents

The overall prevalence of hypertension was 25.4% (80/315) with grade 1HT 14.0%, grade 2HT 9.5% and grade 3HT 1.9%. The prevalence of hypertension across gender was 68.8% for male and 31.3% for female. Prevalence of hypertension steadily increased across different age groups with 6.5% for 21-30, 28.6% for 31-40, 37.7% for 41-50 and 27.3% for 51-60. Figure 2.0 shows the prevalence of hypertension.



Figure 2. Prevalence of hypertension

Prevalence of overweight/ obesity among respondents

Prevalence of overweight among respondents was found to be 33.1% of which 58.7% were male and 41.3% were female. Also 20.3% of the respondents were obese, out of which 26.6% were male and 73.5% were female). (See figure 3.0).



Figure 3. Prevalence of overweight/obesity

Relationship between gender, age and prevalence of hypertension

The prevalence of hypertension among male respondents was found to be higher (68.8%) than females (31.3%). Also, hypertension prevalence among age group 41 - 50 years was highest (37.7%) compared to all other age groups. Details are shown in figures 4 and 5.





X2 = 4.717 P-value = 0.030



Figure 4. Prevalence of hypertension among participants by age





Figure 5. Prevalence of hypertension among participants by BMI

The result of the multiple regression showed that age, body mass index (BMI) and sex are correlates of hypertension. Respondents within the age group of 21-30 years and 31-40 years are three times and two times less likely to develop hypertension than those within the age group of 51-60 years (O.R=0.361(3x) and 0.467(2x); 95% CI=0.137-0.951 and 0.219-0.995) see table 3.0.

Variables	Odds ratio	95%CI	P-value
Age group			
21-30	0.361	0.137-0.951	0.039
31-40	0.467	0.219-0.995	0.048
41-50	0.771	0.375-1.585	0.479
51-60*			
BMI			
Undernourished	0.000	0.000	0.999
Normal	0.290	0.135-0.624	0.002
Overweight	0.370	0.175 - 0.782	0.009
Obese [*]			
Sex			
Male	0.400	0.211-0.756	0.005
Female [*]			

 Table 3. Multiple regression analysis

Discussion

Prevalence of hypertension

Prevalence of hypertension was found to be 25.2% thus one quarter of the non-teaching staff of College of Medicine who is working within the University College Hospital are hypertensive. This is similar to the findings of Mohan, Deepa, Farooq, Prabhakaran and Reddy, (2010) and findings of the World Health Organization (WHO) and Indian Council of Medical Research (ICMR) on non-communicable disease (NCD) risk factor surveillance where the prevalence of hypertension among the industrial population was 26% in all ten centres in India and 25.4% in Chennai. Their findings suggest that hypertension is more obvious in workplace than in the general community given the prevalence of 8-10% reported by Akinkugbe (1992) in rural communities in Africa, the prevalence of 5.9% reported by Oviasu (1978) in a rural community in mid-western Nigeria and 11.0% reported by Kuti (1993) in Aiyetoro community (also rural) in Ondo state.

The prevalence of hypertension among the respondents was seen to be higher in males (68.8%) than in females (33.1%). This is in line with the study conducted by Omuemu, Okojie and Omuemu (2006) where the prevalence of hypertension was higher in males than in females (24.8% male; 13.2% female). Also, study on the systematic review of hypertension in Sub-Saharan African by Juliet, Liam and David (2007) reported a higher prevalence in males than in females (21.6% male; 12.5% female). The lower prevalence of hypertension observed in women could be attributed to the hormonal factor. Research has shown that oestrogen which is females' hormone has a regulatory effect on hypertension (Radwanska, 1993).

Prevalence of overweight/obesity

It is quite glaring that prevalence of overweight and obesity are significantly high among the nonteaching staff of college of medicine. Furthermore prevalence of obesity was higher in female than in male which might have been resulted from sedentary life style typically associated with women. The higher prevalence in female could also have contributed to the low prevalence of hypertension in female than in male because sex hormone binding globulin concentration is lower in obese women thus increasing the amount of bio available oestrogen (Ewa Radwanska, 1993).

Relationship between age, gender, overweight/obesity and prevalence of hypertension

Prevalence of hypertension is seen to increase with age. It was also observed that the prevalence of hypertension increased with age which is in agreement with reports from several studies (Annlia et al, 1988). This was expected since blood pressure tends to increase with advancing age due to hardening of the arteries. This trend of increasing blood pressure with age could also be a reflection of increasing risk factors for hypertension such as obesity which also increases with age (Okojie et al, 2000).

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The study also showed that there is significant relationship between BMI and hypertension. A BMI of 25 correlates closely with increased blood pressure (Abdul-Rahim, Abu-Rmeilehnu, Husseini, Holmboe, Sen, Jarvell and Bjertness, 2000). Other studies also support the fact that weight gain is associated with increased blood pressure and increased incidence of hypertension (Mertens and Van Gaal, 2000). In general, being overweight is associated with a two to six-fold increase in the risk of developing hypertension (Dickey and Janick, 2001). Clinical trials have proved that weight loss is effective in the primary prevention of hypertension as well as in the reduction of both systolic and diastolic blood pressure in patients with normal and high blood pressure (Dickey and Janick, 2001). Several epidemiological studies have shown an association between BMI and blood pressure in normal and overweight patients. Weight loss has been recommended for the obese hypertensive patient and has been shown to be the most effective non-pharmacological treatment approach (Patel, 2000).

Conclusion

This study has once again highlighted the fact that hypertension is a problem in our society, even in the health environment. This is seen in the prevalence of hypertension among them whereby one out of every four non-teaching staff is hypertensive. Also, overweight and obesity has been significantly proven as one of the risk factors of hypertension. It is quite disheartening that those considered being more prone to receiving health information and practicing such by virtue of their work environment as well as looming consequences rampant in the hospital where they work are at high risk of this menace called hypertension. This leaves a question in the heart of many that, if the prevalence of hypertension, overweight and obesity are high among people in learning and hospital environment, what is likely going to be the prevalence among rural communities where there is little or no health information of such? This calls for public health action to help workers of this category live up to expectation health wise.

Recommendations

To address the findings of this research, the following recommendations should be considered.

- 1. Periodic departmental hypertension screening should be included in the hospital policy to help the staff working in the hospital environment
- 2. Live presentations of consequences and complications of overweight, obesity and hypertension should be conducted monthly among the staff as a reinforcing factor for practicing healthy living.
- 3. Sports/ recreational programme should be part of work schedule for staff working in the hospital environment.

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