

Demographic and Clinical Characteristics of Hypertensive Patients Attending a Specialist Clinic in Techiman, Ghana

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Abstract

Hypertension continues to emerge globally as one of the most dangerous cardiovascular disease risk factors. In developing countries, the prevalence of hypertension is increasing rapidly with varied clinical characteristics. This study was aimed to determine the demographic and clinical characteristics of hypertensive patients attending a Specialist Clinic in Techiman, Ghana. Three hundred and forty two (342) hypertensive patients were selected using simple random sampling. Structured questionnaires were used to collect socio-demographic characteristics and clinical data of the study participants. The patients were aged between 23 - 79 years with the mean age (\pm SD) of 46.9 (\pm 12.1) years. There were more females (62.28%; n=213) than males (37.72%; n=129). The mean systolic blood pressure (\pm SD) and the mean diastolic blood pressure (\pm SD) were 138.69 (\pm 32.18) and 92.29 (\pm 18.54) respectively. The pulse rate ranged between 45-162 beats/minute with the mean pulse rate (\pm SD) of 80.40 (\pm 0.89) beats/minute. More than two-third (70.6%) of the patients were farmers (37.1%) and traders (33.5%). High body mass index (BMI) (64%), dyslipidaemia (48.8%), and diabetes mellitus (24.5%) were the most frequently reported cardiovascular risk factors among the hypertensive patients. In conclusion, the most common cardiovascular risk factors seen in hypertensive patients attending a Specialist Clinic in Techiman, Ghana were high BMI, dyslipidaemia and diabetes mellitus. Early detection and control of these risk factors is important in the prevention of target organ complications in hypertension.

Keywords

Blood Pressure, Hypertension, Cardiovascular Risk Factors, Diabetes Mellitus, Dyslipidaemia, BMI

1. Introduction

Most countries in Africa are undergoing an epidemiologic transition due to modernization with an antecedent increase in the risk of cardiovascular diseases (CVDs) such as hypertension, diabetes and dyslipidaemia [1–3]. CVDs are the most important non-communicable diseases in both the developed and developing countries, in terms of morbidity, disability and mortality. According to the report by Murray and Lopez [4, 5] communicable diseases are still the major health threat of African countries, but the non-communicable

diseases (NCDs) especially CVDs were expected to increase rapidly [6]. This has been labelled as a “double burden of disease” in the developing world, the first burden is the unfinished agenda of communicable diseases and the second burden is the emerging agenda of non-communicable diseases resulting from an epidemiologic transition [7]. While the epidemic of CVDs is declining in developed countries, it is accelerating in most developing countries [8, 9] Current estimates and projections suggest that the burden of CVDs, diabetes and related risk factors in African countries is important, somewhat unique and rapidly growing. Various segments of the population are affected;

however, the group mostly affected is young adults residing in urban areas, and increasingly those in the low socioeconomic strata.

Hypertension is one of the most rapidly advancing fields in medicine. The last few years have seen an enormous number of studies which have served to increase our knowledge and understanding of hypertension [10, 11]. Hypertension continues to emerge globally as one of the most dangerous cardiovascular disease risk factors. People with untreated or poorly controlled hypertension often have the risk of developing complications such as left ventricular hypertrophy, congestive cardiac failure, retinopathy, cerebrovascular disease and renal insufficiency [12–14]. The toll of hypertension as a chronic disease on population health and the resultant impact on the often already stressed medical systems of developing nations is a serious concern. In developing countries, particularly in sub-Saharan Africa, it has been suggested that the prevalence of hypertension is increasing rapidly generally because of increasing longevity and the continuous effect of contributing factors such as obesity, physical inactivity and an unhealthy diet [15–18]. More recently, studies on hypertension in Ghana have indicated a crude prevalence between 25% and 48%, with the prevalence higher in urban populations than in rural populations [19]. Evidence also suggests that many Ghanaians living with hypertension are not aware that they have the condition [20], hence are of greater risk of developing major adverse cardiovascular events.

Few epidemiologic data on the demographic and clinical characteristics of hypertensive patients are available in sub-Saharan Africa [19, 21, 22]. However, data on the demographic and clinical characteristics of hypertensive patients attending out-patient clinics in semi-urban communities in Ghana have not been fully assessed. This study was therefore designed to determine the demographic and clinical characteristics of hypertensive patients attending Specialist Clinic in Techiman, Ghana.

2. Methods and Materials

The study was a hospital-based prospective descriptive study carried out at the Hypertension Clinic of the Holy Family Hospital, Techiman, Ghana, from November 2014 to April 2015. Informed consent was obtained from each study participant. Patients aged 18 years and above attending the Hypertension Clinic of the Holy Family Hospital, Techiman, Ghana with clinical diagnosis of hypertension were recruited. Three hundred and forty two (342) hypertensive patients were selected using simple random sampling. Standardized, pretested, structured questionnaires were used to collect socio-demographic characteristics and clinical data of study participants. The baseline demographic, clinical, chest X-ray and electrocardiographic (ECG) characteristics of the patients were examined.

Clinical examination included the pulse; rate, rhythm, volume and the character. The blood pressure, the apex beat, the heart sounds (S1, S2, S3 and S4) and murmurs were also

examined. The blood pressure (BP) was recorded in left arms, with patients lying supine after a 10-minute rest, using a mercury sphygmomanometer with a cuff size 12cm long and 35cm wide. The cuff was positioned at the heart level and deflated at 2 mm/s and the blood pressure was measured to the nearest 2 mmHg. Systolic blood pressure (SBP) was recorded as appearance of the Korotkoff sounds (phase I) whilst diastolic blood pressure (DBP) was recorded as disappearance of the Korotkoff sounds (phase V). Three readings were taken. A first measurement was used to familiarise the subject with the procedure. The blood pressure was repeated twice at five minutes intervals, during which the subject remained seated. The mean of the later two readings was used in the analysis.

Hypertension was defined as the presence of a persistent elevated SBP ≥ 140 mmHg and/or diastolic DBP ≥ 90 mmHg, and/or the use of anti-hypertensive drugs and/or past medical history of hypertension [23]. A resting 12 lead ECG was obtained from each patient according to standard procedure, and evaluated by the authors. The ECGs were examined for the heart rate, the rhythm, electrical conduction, chamber enlargement, arrhythmias, and other abnormalities. Electrocardiographic LVH criteria used in this study was Scott's Criteria [24] and LVH was diagnosed on the basis of fulfillment of at least one of the following criteria on ECG:

- R in I added to S in III >25 mm
- R in aVL > 7.5 mm
- R in aVF >20 mm
- S in aVR > 14 m
- S in V1 (or V2) added to R in V5 (or V6) > 35 mm
- R in V5 or V6 > 26 mm
- R + S in any precordial lead > 45 mm

2.1. Inclusion Criteria

Adult patients aged 18 years and above with documented diagnosis of hypertension attending hypertension clinic, who met the criteria were included in the study.

2.2. Exclusion Criteria

The following patients were excluded from the study: patients seen with suspected hypertension but could not meet the diagnostic criteria.

2.3. Ethical Consideration

All procedures were carried out according to a study protocol approved by the Committee on Human Research Publication and Ethics of School of Medical Sciences, the Kwame Nkrumah University of Science and Technology, Kumasi. Informed consent was obtained from all subjects. The objectives and nature of the study were explained to all subjects. The information about participant's identity was not included with the other data and only the principal investigator had access to this information.

2.4. Statistical Design and Analysis

Data was collected and edited to exclude errors, re-

organized, coded and manipulated with appropriate software for efficient analysis. Data were entered into Filemakerpro11.0 version and then exported to Microsoft Excel 2007 version for cleaning. Data was then transferred to Strata SE version 11.1 for statistical analysis. Data was analyzed for frequency of distribution, proportions, percentages and mean \pm SD.

3. Results

Three hundred and forty two (342) hypertensive patients were studied. The minimum age was 23 years and the maximum age was 79 years with a mean age (\pm SD) of 46.94(\pm 12.11) years. There were more females (62.28%; n=213) than males (37.72%; n=129). The mean age (\pm SD) of the females and the males were 47.52 (\pm 18.84) and 45.57 (\pm 17.33) respectively. The mean systolic blood pressure (\pm SD) and the mean diastolic blood pressure (\pm SD) were

138.69 (\pm 18.31) and 82.36 (\pm 10.42) respectively. The pulse rate ranged between 45-168 beats/minute with the mean pulse rate (\pm SD) of 80.40 (\pm 0.89) beats/minute. Table 1 shows baseline characteristics of the study patients.

About eighty one percent (80.7%) of them were Christians, 17.0% were Moslems, 2% were pagans and 0.3% had no religious affiliation. Those with primary level education were the largest group 37.4%, 28.1% had secondary level education, and 12.0% had tertiary level and 24.0% had no formal. About thirty seven percent (37.1%) were farmers, 33.5% were traders. 6.7% were artisans, 12.6% were civil servants, 7.6% were unemployed mainly as a result of retirement while the employment status of 3.5% could not be ascertained. The most frequent cardiovascular risk factor was high BMI (64%), followed by dyslipidemia (48.8%) and diabetes mellitus (24.6%). A history of hyperuricaemia was present in 21.4% of the patients and only 6.1% were smokers.

Table 1. Demographic and baseline characteristics of hypertensive patients.

Characteristic	FEMALE, N=213, Mean \pm SD	MALE, N=129 Mean \pm SD	P-value	(95%, CI)
Age (Years)	46.94 \pm 12.11	44.92 \pm 11.97	0.095	45.40-47.50
pulse rate (bpm)	80.40 \pm 0.89	78.18 \pm 1.28	0.074	78.24-81.08
Weight (Kg)	69.88 \pm 0.85	66.05 \pm 0.85	0.005*	67.31-69.87
Height (cm)	160 \pm 22.45	162 \pm 7.34	0.182	159.67-163.08
BMI (Kg/m ²)	27.72 \pm 6.99	25.13 \pm 4.58	0.001*	26.27-27.43
Underweight, n (%)	7(3.29)	10(7.75)	0.241	16.54-17.88
Normal, n (%)	60(28.17)	51(39.53)	0.016	22.09-22.64
Overweight, n (%)	64(30.05)	38(28.46)	0.171	27.16-27.68
Obese, n (%)	82(38.50)	30(23.25)	0.408	32.98-35.51
SBP (mmHg)	138.69 \pm 18.31	139.31 \pm 18.68	0.348	129.68-133.34
DBP (mmHg)	82.36 \pm 10.42	83.19 \pm 11.01	0.171	78.83-80.80
Pulse Pressure(mmHg)	56.11 \pm 14.55	56.93 \pm 20.44	0.432	50.19-53.29
FHH, (Yes/No)	166/213	40/129	0.013*	

Bpm = beat per minute, BMI = Body mass index, SBP = Systolic blood pressure, DBP = Diastolic blood pressure, FHH=Family history of hypertension, CI=Confidence interval at 95%

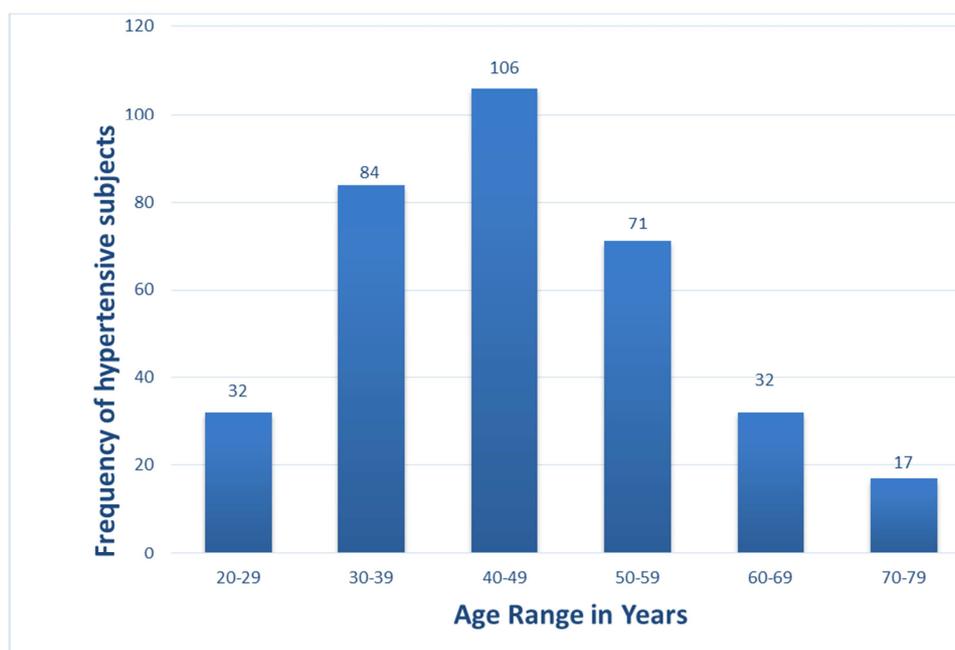


Figure 1. Age distribution of hypertensive patients.

Table 2. Socio-demographic characteristics of the study patients.

Variables	Female n(%)	Male n(%)	p-value
Marital Status			
Married	125(58.65)	105(81.40)	0.000*
Single	3(1.26)	11(85.27)	
Divorced	30(14.08)	10(7.75)	
Widow/widower	55(25.82)	5(3.86)	
Occupation			
Farmer	75(35.21)	52(40.31)	0.100*
Trader	98(46.01)	13(10.08)	
Civil /public servant	22(10.33)	21(16.28)	
Artisan	7(3.29)	16(12.40)	
Unemployed	7(3.29)	19(14.73)	
Others	4(1.88)	8(6.20)	
Religion			
Christian	181(84.98)	95(73.64)	0.111
Moslem	30(18.08)	29(22.48)	
Pagan	2(.93)	5(3.88)	
Educational level			
Tertiary	15(7.04)	26(20.16)	0.000*
Secondary	50(23.47)	46(35.66)	
Primary	91(42.72)	37(28.68)	
No formal education	62(29.11)	20(15.50)	

Table 3. CVD risk factors in the study patients.

Variables	Female n(%)	Male n(%)	P-value	Odds ratio
Diabetes mellitus				
Yes	53(24.9)	31(24.0)	0.601	0.54
No	160(75.1)	98(76.0)		
BMI				
Normal	60(40.0)	91(58)	0.001*	0.48
Overweight/obese	153(60.0)	66(42)		
Dyslipidaemia				
Yes	85(49.1)	82(25.6)	0.029	2.80
No	128(50.9)	47(74.4)		
Alcohol				
Yes	54(24.4)	46(50.4)	0.000*	1.20
No	161(75.6)	64(49.6)		
Serum uric acid				
Normal	268(78.6)	124(72.5)	0.006*	0.72
High	73(21.4)	47(27.5)		
Cigarette smoking				
Yes	0(0)	21(16.3)	0.000*	0.96
No	213(100.0)	108(83.7)		

4. Discussion

This study provides recent data on the demographic and clinical characteristics of hypertensive patients attending a Specialist Clinic in a semi-urban community in Ghana. A total of 342 hypertensive patients (129 male and 213 female) were selected by simple random to conduct the study. More than 50% of our study sample was females (63%). This compares well with similar studies in Ghana [20, 25], Nigeria [26] and Brazil [27] where more than 50% of the population sampled were females. Studies have shown that the incidence and the progression rate of hypertensive cardiovascular complications are markedly higher in men than in age-matched, premenopausal women [28, 29]. But after menopause, this relationship no longer exists, and elderly

women have similar rates of cardiovascular disease, and even higher prevalence of hypertension than men [29, 30].

In our study more than two-third (70.6%) of the patients were farmers (37.1%) and traders (33.5%). Most of the people in this study site are involved in peasant farming and trading. This might explained the high proportion of farmers and traders in this study sample. Seven percent (7.6%) of the patients were unemployed, while the employment status of 3.5% could not be ascertained. Although most of the people in semi-urban community work very hard in their routine chores and very simple in their dietary habits, the correlation between semi-urban life and hypertension is not well elucidated.

Majority of the patients 63.4% had primary (37.4%) and secondary (28.1%) levels of education. It was not surprising that most of these patients had primary and secondary levels of education as their highest educational attainment. This is probably because the study was in a semi-urban community and majority of the individuals are involved in farming and trading, hence they will not be self-motivated to pursue higher educational qualifications. Most of the people living in and around the study site are involved in trading, and the study site is considered to have the largest market in Ghana.

The mean age (\pm SD) of the patients in this study was 46.94 (\pm 12.11). This is comparable to the mean age of 46.94 (\pm 12.11) in an earlier study in Ashanti Region, Ghana and 46.1 (\pm 12.11) in a study involving blood pressure control among hypertensives managed in a specialized healthcare setting in Nigeria[31]. However, the mean age was lower than the mean age of patients with hypertensive heart failure reported by an earlier study in Kumasi [32]. Owusu IK. et al [32] reported that the mean age of Ghanaians with heart hypertensive failure was 63.59 (\pm 18.12). Females had slight higher mean age than males (48.19 \pm 8.95 years vs. 45.74 \pm 13.13 years) in this study. This difference in age among the gender age could be due to the fact that more females were included in the study.

The consistent increase of blood pressure with age in both men and women is a well- established occurrence and has been reported earlier in Ghana [20]. A recent study in Nigeria showed that blood pressure increased with age [33]. It has been stated that the prevalence of hypertension increases with advancing age to the point where more than half of people aged between 60 to 69 years and approximately three-quarters of those aged 70 years and older are affected [34]. Though blood pressure increased with age, men had a significantly higher blood pressure than women in all the age groups. In our study 60% of the patients were included in the age group of 40 to 70 years and more than half of the patients were 40 years or above.

The mean SBP (138.42 \pm 32.18 mmHg) and the mean DBP (82.29 \pm 18.54 mmHg) of the patients in this study is comparable to a similar study among hypertensive patients in a rural communities in Ghana [20, 25]. Owusu IK. [32] reported a high mean SBP and mean DBP of 175 \pm 15 mmHg and 112 \pm 24 mmHg respectively, among Ghanaians with

hypertensive heart failure. The difference in the data may reflect the distinct methodologies used and baseline differences between the study patients. Treating SBP and DBP to targets that are <140/90 mmHg is associated with a decrease in CVD complications [35]. In the same vein, studies have also consistently demonstrated that as the SBP and the DBP increase, the risk of cardiovascular events increases continuously [36]. A positive relationship between diastolic dysfunction and the level of the BP has also been established [37], with the degree of the diastolic dysfunction proportionate to increasing level of blood pressure.

A high prevalence of high BMI, dyslipidemia and diabetes as CVD risk factors were found in our study of hypertensive patients. These findings are similar to those from previous studies in some African countries [38–40]. A recent study in Nigeria showed that blood pressure positively correlates with raised body mass index [33]. In Cameroon, Shey Wiysonge et al [39] reported a significant association between obesity and hypertension. In Egypt, El-Shafei et al [40] reported that elevated BMI were significantly associated with an increased risk of essential hypertension. In Uganda, hypertension was found to be associated with high BMI and diabetes [38]

Overweight and obesity has been previously thought to be a metabolic disorder restricted to developed countries, but recent evidence has shown that, it is becoming a challenge in many low and middle income countries [41]. Overweight and obesity is characterized by raised body mass index (BMI), and are known to be associated with substantially increased risk for developing major adverse cardiovascular events such as coronary artery diseases, heart failure, hypertension, stroke, type II diabetes.

The concordance of hypertension and diabetes is increasing in the general population. Systemic hypertension is disproportionately higher in diabetics [42, 43], while persons with elevated BP are two and a half times more likely to develop diabetes within 5 years [44]. The coexistence of hypertension in diabetes is particularly pernicious because of the strong linkage of the two conditions with all CVD, stroke, progression of renal disease and diabetic retinopathy [35]. This underscores the need to encourage and established pragmatic preventive efforts such as regular physical activity and healthier dietary choices in order to reduce or reverse the impending epidemic of these modifiable cardiovascular risk factors..

Six percent (6.2%) of our study patients were smokers which compares well with studies in France where 9% of their study sample were active smokers [45], but lower than that found in Oghara community in Nigeria, where the prevalence was 15.6% [41].

5. Conclusion

The findings of this study have revealed high levels of modifiable cardiovascular risk factors among hypertensive patients attending a Specialist Clinic in Techiman, Ghana. The clustering of the cardiovascular risk factors such as hypertension, obesity, dyslipidaemia, and diabetes mellitus is

a huge, important public health problem. Early detection of these risk factors will enable prompt interventions to prevent grave target organ complications in hypertension.

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