An Appraisal of Hospital Based Blood Pressure Control in Port Harcourt, Nigeria.

Type of Article: Original

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ABSTRACT

Background

Adequate blood pressure control is a major strategy, in the attempt to reduce the morbidity and mortality of hypertension related cardiovascular disease. The aim of this study was to determine the level of blood pressure control among patients receiving treatment for hypertension in a specialist medical outpatient clinic (MOPD) of The University of Port Harcourt teaching hospital (UPTH).

Method

A prospective descriptive cross sectional study was undertaken over three months, to determine the level of blood pressure control among patients receiving treatment for hypertension.

Result

Two hundred and seven (207) patients were evaluated. The mean systolic blood pressure of all the study subjects was 149±19.33mmHg while the mean diastolic blood pressure was 93.48±13mmHg. A total of fifty subjects (24.2 %) had controlled blood pressure of less than 140/90mmHg.

Conclusion

The percentage of hypertensive patients who achieved adequate blood pressure control is low. There is need to identify impediments to good blood pressure control and deal with them so as to optimize the benefit of antihypertensive treatment.

Keywords: Blood Pressure; Control; Port Harcourt Hospital

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INTRODUCTION:

Cardiovascular disease is the number one cause of death worldwide, as it accounts for twenty five percent of all cause mortality as well as being a major contributor to morbidity[1]. Hypertension which is the leading risk factor for cardiovascular disease, affects over a quarter of the world's population [2]; furthermore the control of hypertension is a major strategy for the control of cardiovascular disease.

In spite of the availability of a myriad of drugs for the control of hypertension, adequate blood pressure control generally defined by blood pressure of less than 140/90 mmHg[3,4] especially for people without compelling indication, remains an immense challenge globally; as inadequate blood pressure control is a major contributor to the morbidity and mortality from hypertension. The World Health Organization estimates that suboptimal blood pressure control is responsible for 62% of cerebrovascular disease and 49% of ischemic heart disease[5]. It is also observed that death from ischemic heart disease and stroke increases progressively from blood pressure levels as low as 115mmHg systolic and 95mmHg diastolic[6].

The assessment of hypertension control and evaluation of the impact of poor blood pressure control, reveal poor rates of hypertension control as well as an enormous burden of cardiovascular morbidity globally[3-5]. In the United States, only about 34% of hypertensive patients have their blood pressure controlled to less than 140/90mmHg[7]. In Nigeria hypertension affects about 14.5% of the population[8] and in the absence of a national control programme, estimates for blood pressure control are likely to be generated from hospital based studies, as a result there are no consistent National estimates of blood pressure control.

The impact of uncontrolled blood pressure in Sub Saharan Africa is illustrated by studies on blood pressure from different parts of Sub Saharan Africa which show that uncontrolled hypertension is the greatest contributor to stroke, chronic kidney disease and heart failure[9-11]. Similarly the report of a study in Accra Ghana showed that hypertension is estimated to result in 42.5% of heart failure cases[12]. In view of the grave and enormous impact of uncontrolled blood pressure in Africa, the need for adequate blood pressure control in our hypertensive patients can therefore not be overemphasized, especially as the health systems in the region are not well developed to cope with consequences of inadequate blood pressure control such as stroke, chronic kidney disease and coronary heart disease.

This study was undertaken to document the level of blood pressure control in The University of Port Harcourt teaching Hospital (UPTH), in Southern Nigeria.

METHODOLOGY: A prospective descriptive study lasting three months (March to May 2007) , was done in the cardiology clinic of the University of Port Harcourt teaching Hospital Port Harcourt (UPTH), a major referral tertiary health institution in southern Nigeria.

The study subjects were patients attending the cardiology clinic of UPTH who were receiving treatment for hypertension alone or in combination with other diseases. Consecutive patients who gave informed consent were recruited as study subjects over the study duration. Patients who admitted to non compliance with prescribed

medications were excluded from the study. The subjects were seen three times in the course of the study on a monthly basis. Blood pressure was measured at each visit with acosson mercury in glass sphygmomanometer using standard protocol[13]. The average blood pressure for the three visits were calculated and control was considered to be adequate if the average pressure was less than 140/90mmHg.

Height and weight were measured during the first visit using a mounted meter rule and weighing scale respectively. The body mass index (BMI) was calculated using the formula Weight in Kg/Height in meters^2. Seven milliliters of blood was collected from each of the study subjects for the estimation of fasting blood sugar and serum lipid profile during the first visit.

The approval of the Ethics and Research Committee of the University of Port Harcourt Teaching hospital was obtained before proceeding with the study. Informed consent was obtained from each participant in the study after proper explanation of the study procedure.

Data was analyzed using the statistical package software SPSS 16 for Windows and Epi info 3.3.3 statistical software. Mean, standard deviation, Median and Range was calculated for quantitative and qualitative data. The student's t- test was used as appropriate. A p value of < 0.05 was set as statistically significant. Correlation/Multivariate regression analysis was used as appropriate.

RESULTS:

Age and Sex Distribution: The age range was 24 to 76years, mean age was 50.86±9.13years, majority of subjects were in the 40 49 years (38.2%) and 50 59 year (34.8%) age group. (Table I).

A total of two hundred and seven (207) patients made up of one hundred and seven (107) females and one hundred (100) males were evaluated during the period giving an M: F ratio of 0.9:1. (Table I)

Distribution of subjects by disease association: A total of one hundred and twenty nine (62.3 %) were receiving treatment for hypertension only while seventy eight (37.7%) were receiving treatment for both hypertension and diabetes mellitus (Table I).

BMI distribution: The mean BMI of the study subjects was 27.8±3.24kg/m^2 with a range of 19.8 43.1 kg/m^2. Majority of study subjects 123 (59.4%) had BMI level between 25 29.9 kg/m^2, while 39(18.8%) had BMI level of 18 24.9 kg/m^2 and 44 (21.3%) had BMI level of 30kg/m^2 or more. See (Table I).

BLOOD PRESSURE OF STUDY SUBJECTS:

The mean systolic blood pressure of all the study subjects was 149±19.33mmHg while the mean diastolic blood pressure was 93.48±13mmHg. A total of fifty subjects (24.15 %) had controlled blood pressure of less than 140/90mmHg. (Table II). The mean systolic and diastolic blood pressure respectively in the study subjects who were hypertensive only was 150.48±17.28mmHg and 95.04±13.9mmHg while the mean systolic and diastolic blood pressures in hypertensive's with diabetes was 146.92±22.35mmHg and 90.89±12.18mmHg. There was no significant difference between the mean systolic blood pressures of both groups. A significant difference was observed in the mean diastolic blood pressures of both groups p = .026. (Table II). A total of 24 subjects (18.6 %,) with hypertension only had controlled blood pressure while 26 subjects (33.3%) with hypertension and diabetes had controlled blood pressure, there was no significant difference in the proportions with a p = 0.32.

Blood sugar in study subjects: The mean fasting blood sugar in the study subjects was 6.73+1.91mmol/L (Table I) Comparison of the mean blood sugar in hypertensive only and hypertensive and diabetics is shown in Table II. The Fasting blood sugar was significantly higher in hypertensives and diabetics compared to hypertensives only 8.28±1.48mmol/L and 5.78mmol/L, p = .000.

Lipid profile of study subjects: The mean total cholesterol in all the study subjects was 6.45+1.23mmol/L (Table I). The distribution of total cholesterol among study subjects is also shown in Table I. Majority of the study subjects 117 (56.4%) had elevated total cholesterol, with 81subjects (39.1 %) having total cholesterol of 5.2 6.5mmol/L, and 36 (17.3%) having total cholesterol >7.8mmol/L.

Correlations of blood pressure and study variables: Systolic blood pressure showed significant negative correlation with FBS [r= -.334, p = .003], total cholesterol [r = -.295, p = .009], triglyceride [r = -.235, p = .038]. Diastolic blood pressure showed significant negative correlation with FBS [r = -.466, p = .000], total cholesterol [r = -.319, p = .004], triglyceride [r = -.290, p = .010]. There was no significant correlation

Table I. Demographic and biochemical variables of study subjects

Parameters	Frequency distribution of variables			No (%)	Range	Mean (SD)
Age (Years)	1829			2 (1.0 %)	24 76	50.86 (9.13)
	3039			16 (7.7 %)		
	4049			79 (38.2 %)		
	5059			72 (34.8 %)		
	6069			33(15.9 %)		
	6079			5(2.4 %)		
Sex	Male (M)			100(46.4%)		
	Female (F)			107 (51.6%)		
Disease association	Hypertension only			129(62.3 %)		
	Hypertensive + Diabetic			78 (37.7%)		
BMI(Kg/m^2)	< 18			1 (0.5 %)	19.8 43.1	27.8 (3.24)
	18 24.9			39 (18.8 %)		
	25 29.9			123 (59.4 %)		
	30 34.9			40 (19.3 %)		
	35 39.9			2(1.0 %)		
	> 40			2(1.0 %)		
Blood Sugar (mmol/L)					3.1 11.2	6.73(1.91)
		M	F	Total		
Total Cholesterol	5.2	28	13	41(19.8%)	4.1 9.4	6.45(1.23)
(mmol/L)	5.2 6.5	33	48	81(39.1%)		
	6.5 7.8	19	30	49(23.8%)		
	> 7.8	20	16	36(17.3 %)		

Table II. Comparison of study variables between subjects by disease association

	Groups by disease association	N	Mean	Std. Deviation	P value
body mass index	HTN	129	27.74	3.30	
Kg/m^2	HTN+DM	78	27.81	3.15	.881
systolic blood pressure(mmHg)	HTN	129	150.54	17.28	
	HTN+DM	78	146.92	22.35	.223
diastolic blood pressure(mmHg)	HTN	129	95.04	13.9	
	HTN+DM	78	90.89	12.18	.026
fasting blood sugar	HTN	129	5.78	1.49	
mmol/L	HTN+DM	78	8.28	1.48	.000
total cholesterol	HTN	129	6.12	1.09	
mmol/L	HTN+DM	78	6.98	1.28	.000
high density lipoprotein(mmol/L)	HTN	129	1.05	0.32	
	HTN+DM	78	0.82	0.27	.000
Triglycerides	HTN	129	1.92	0.57	
(mmol/L)	HTN+DM	78	2.29	0.53	.000
low density lipoprotein(mmol/L)	HTN	129	4.24	1.24	
	HTN+DM	78	5.03	1.29	.000

HTN = Subjects with hypertension only

HTN+DM = Subjects with hypertension and diabetes

between systolic and diastolic blood pressure with age, gender and BMI.

DISCUSSION:

Adequate blood pressure control is a major approach in the reduction of death and disability attributable to cardiovascular disease; nevertheless adequate blood pressure control to less than 140/90mmHg has remained a challenge globally. Adequate blood pressure control rates vary widely in different parts of the world. In the United States of America, among those receiving treatment, only about 34% of hypertensive patients have their blood pressure controlled to less than 140/90mmHg[7]. In Cuba where a program for the control of hypertension has been in place, adequate blood pressure control to less than 140/90mmHg has been achieved in 39% of hypertensives, an estimate which is said to be one of the highest in the world[14]. In Canada adequate control amongst hypertensive patients is estimated to be 17%, and in some Europe countries the rate is even lower at about 10%[15].

Hypertension is common in Africa and is the commonest cause of cardiovascular disease on the continent and an important cause of mortality[5,16]. In the present study, we found an adequate blood pressure control rate of only 24.2% in the patients studied. In a similar study from northern Nigeria, the adequate blood pressure control rate was 42.7%[17]. In two populations based study from Ghana adequate blood pressure control was achieved in only about 2.8% and 6.2% of those receiving treatment[18,19], while another study in South Africa[20], reported adequate blood pressure control rates of 33% in males and 44% in females. The rates of hypertension control reported in this study is lower than that reported in the Cuban[14], South African[20] and Northern Nigeria[17] reports stated above and higher than the reports from Ghana[18,19], Canada and Europe[15]. However it is should be noted that the rates of blood pressure control reported in this study is still inadequate, especially considering that patients with poor drug compliance were excluded in this study, this may indicate higher rates of poor control if these group of patients were considered. The implications of this report is a higher risk of cardiovascular complications among hypertensive patients in Port Harcourt, as it has been shown that in patients with a previous stroke or TIA, the risk of recurrence as well as the risk of coronary heart disease events is directly related to the level of blood pressure [18,19,21]. In addition the relationship between blood pressure and risk of cardiovascular disease events (CVD) event is continuous, consistent and independent of other risk factors, thus the higher the blood pressure the greater the chance of heart attack, heart failure and end stage renal disease[21], thus this poor rate of blood pressure control would no doubt contribute to increase cardiovascular disease rates as well as increased mortality.

The poor blood control rates observed in this study may also be related to other impediments to good blood pressure control such as the prescription patterns of physicians[21] and adherence to treatment guidelines[23] especially with the exclusion of drug compliance as a factor. The prescription pattern of physicians and guideline adherence was not evaluated in the study, as the aim was just to report the level of blood pressure control in a patient population receiving specialist care with adequate treatment adherence.

It also observed from this study that about 56.4% of subjects had hypercholesterolemia, 59.4% were overweight and 21.3% were obese. Obesity and dyslipidemia are recognized risk factors for hypertension and their presence in patients receiving treatment may contribute to the poor blood pressure control rates observed in this study; though the results of this study showed negative correlation between blood pressure with blood sugar and cholesterol values. This is explained by the better rates of blood pressure control in diabetic hypertensive subjects who had higher cholesterol and blood sugar values than subjects who were only hypertensive. The high rates of these risk factors may be suggest poor emphasis on life style measure modification measures, as inadequate emphasis on non drug measures affects control as demonstrated by a study in South Africa[20] which identified tobacco use, excess alcohol use, and sedentary life style as factors responsible for poor control. It is thus essential that lifestyle modification and non-drug treatment measures such as education, reduction in weight, reduction in salt intake and regular exercise as well as cessation of tobacco and reduction of alcohol should emphasized and intensified in our patients.

CONCLUSION

The level of blood pressure control among drug compliant hypertensive patients receiving treatment in the University of Port Harcourt teaching hospital, Nigeria is low and unsatisfactory. The documentation of such low rate of blood pressure control in specialist and tertiary care setting may

suggest worse control rates at lower levels of healthcare (primary and secondary). This study also reported high rates of obesity and dyslipidemia among the hypertensive patients studied. It is thus advocated that Physicians place more emphasis on achieving treatment goals and blood pressure control in hypertensive patients. Furthermore lifestyle modification aimed at modifying risk factors like obesity and the adherence to treatment guidelines by physicians are also recommended.

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ACKNOWLEDGMENT:

The authors acknowledge the Nursing staff, clinical assistants and Interns who worked in the MOPD during the course of the study for their assistance.

COMPETING INTEREST:

The authors declare no conflict of interest in this work