Patient related barriers to adequate blood pressure control among adult hypertensive patients seen at Kiambu County Hospital, Kenya

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Abstract

Introduction: Hypertension is a key precursor to cardiovascular and renal disease globally. According to WHO, Prevalence of hypertension was about 40 % globally in 2015 and 45% in Sub Saharan Africa in 2015. Despite much emphasis on treatment of the syndrome, the related blood pressure control remains poor or inadequate.

Objective: The study sought to establish the patient related barriers to *adequate blood pressure control* among adult hypertensive patients in Kiambu Count Hospital in Kenya.

Methods: A cross -sectional descriptive study method approach was used to examine sample of 330 patients selected through consecutive sampling technique in the medical outpatient chronic disease clinic. Multivariate logistic regression analysis was used to determine variables associated with inadequate or poorly controlled hypertension among adult patients.

Results: Most of the patients were females (71.5%). However, the presence of inadequate blood pressure control was significantly higher among males (P-value=0.009). Regularly taking of hypertension drugs for the last 6 months was significantly associated with adequate blood pressure control (p-value=0.033). The other barriers including single status, inadequate knowledge, employment and time duration since diagnosis of hypertension did not significantly affect blood pressure control status.

Discussion: Males were 54% more likely to have inadequate blood pressure control compared to females (AOR=0.543; 95%CI=0.323-0.914). Patients with low adherence to treatment were 11% more likely to have inadequate blood pressure control than those with high adherence rate (AOR=1.093; 95%CI=0.224-5.332) though the association was not significant (p-value=0.912).

Conclusion: Male gender was a major barrier to adequate blood pressure control. Patients who well adhered to treatment scheme for a duration of six months preceding the study had their blood pressure better controlled than

those who did not. Male hypertensive patients need to be followed up to ensure they adhere to drug treatment in order to reduce the rates of inadequate blood pressure control and other related complications.

Keyword: Hypertension, blood pressure, cardiovascular, renal disease.

Introduction

Hypertension is a dominant precursor for cardiovascular and renal disease globally[1]. According to WHO, the prevalence of hypertension among patients was about 40 % globally and about 46% in Sub Saharan Africa. This was about approximately 26.7% in Kenya in 2015 [1,2,3]. Blood pressure control is described as per the Joint National Committee 8 guidelines.[4] and only 50% of hypertensive patients in the United States were adequately controlled [5]. In Sub-Saharan Africa, blood pressure control rates were around 33.9% [6]. Similarly, the level of adherence to hypertension treatment in a Nigerian study was found to be 31.3% hence poor blood pressure control. In another study in Nyeri Kenya, only 33.4% of all hypertensive cases had good blood pressure control [7] . Low adherence to taking medicine was attributed to various patient related obstacles, which included, marital Status, inadequate knowledge about hypertension, gender, cost, employment, side effects and duration since diagnosis [6].

Information on patient associated impediments to blood pressure control focusing on patients' themselves in Kenya is scanty. The current study, therefore aims to establish the patients related barriers to blood pressure control among adult hypertensive patients in Kiambu County Hospital.

Materials and methods

This was a cross sectional cohort descriptive study of adult hypertensive patients in Kiambu County Hospital conducted between January-June 2019. Blood pressure control was the outcome of interest and was described as adequate or inadequate. A sample size of 330 hypertensive patients was arrived at using the formula for prevalence studies [8].

Data analysis was done using SPSS version 20. Continuous variables were expressed using median and interquartile range. Multivariate logistic regression analysis was used to determine the independent variables related to inadequate or poorly controlled hypertension. Signed consent from each patient was obtained and so was the permission to conduct the study obtained from the relevant authorities in Kiambu Hospital Management.

Results:

Data from 330 participants was analyzed. There were more females than males (Table 1). The prevalence of inadequate blood pressure control was higher among males (69.2%) compared to females (54.2%). In Figure 1, 97.3% of the patients had a good knowledge about the importance of taking hypertensive drugs.

Table 1: Socio-demographic Characteristics

Variables	Total	Current blood pressure		(c2)-
		Inadequate (%)	Adequate (%)	
Gender				
Male	94	69.2	30.8	0.013
Female	236	54.2	45.8	
Marital status				
Single	22	50.0	50.0	0.699
Married	231	59.3	40.7	
Widowed	77	58.4	41.6	
Median (IQR) age in years				
	57 (48-69)			
Age-groups				
< 30 years	8	62.5	337.5	0.670
30-50 years	93	54.8	45.2	
> 50 years	228	160.1	39.9	
Level of education				
None	59	61.0	39.0	0.774
Primary	139	55.4	44.6	
Secondary	99	59.6	40.4	
Tertiary	33	63.6	36.4	
Employment				
Yes	142	54.9	45.1	0.231
No	188	61.2	38.8	
Alcohol				
No	292	58.6	41.4	0.937
Yes	38	57.9	42.1	
Smoking				
No	289	57.4	42.6	0.306
Yes	41	65.8	34.2	

Levels of patients' Knowledge about hypertension

Figure. 1: Levels of patients' knowledge on hypertension.

The patients who scored 10 to 12 points had good knowledge, 6 to 9 points average and low knowledge for those who scored less than 6 (Figure 2).

Figure 2: Level of knowledge by blood pressure control levels among hypertensive patients.

Table 2 is the data on patients' behaviour towards taking hypertension drugs where majority of the patients modified their lifestyle. Blood pressure control was good in 83.9% of those who regularly took medication within the last six months compared to those who did not (71.7% vs. 56.0%).

In multivariate analysis, being male was significantly associated with inadequate blood pressure control both at univariate and multivariate levels. After adjusting for other co-variables in the model, males were 54 times more likely to be associated with the inadequate blood pressure control (AOR=0.543; 95%CI=0.323-0.914).

Table 2: Blood pressure control and lifestyle modification

Variable	Total	Blood Pressure Control		(c2)-
		<u>Inadequate</u>	<u>Adequate</u>	P-value
		n (%)	n (%)	
<u>Regularly take drugs for 6 months</u>				
Yes	277	155 (56.0)	122 (44.0)	0.033
No	53	38 (71.7)	15 (28.3)	
<u>Regular check for BP</u>				
Yes	272	153 (56.3)	119 (43.7)	0.074
No	58	40 (69.0)	18 (31.0)	
<u>Regular weight check-up</u>				
Yes	180	97 (53.9)	83 (46.1)	0.047
No	149	95 (64.4)	53 (35.6)	
<u>Reduce salt intake</u>				
Yes	262	152 (58.0)	110 (42.0)	0.734
No	68	41 (60.3)	27 (39.7)	
<u>Duration of HTN treatment</u>				
< 6 months	46	29 (63.0)	17 (37.0)	0.789
6-12 months	57	33 (57.9)	24 (42.1)	
> 12 months	224	129 (57.6)	95 (42.4)	

Table 3: Multivariate logistic regression model relating inadequate blood pressure control and adjusted for other risk factors (95%CI)

Variables	COR	p-value	AOR	95%CI	(c2)-
Gender					
Male	Ref				
Female	0.529	0.318-0.878	0.014	0.543 0.323-0.914	0.021
Employment					
No	Ref				
Yes	0.774	0.497-1.204	0.255	0.795 0.497-1.272	0.340
Knowledge of hypertension					
Low	Ref				
Average	0.516	0.193-1.380	0.187	0.575 0.207-1.600	0.289
Good	0.362	0.138-0.950	0.039	0.504 0.182-1.394	0.187
Regularly take drugs for 6 months					
No	Ref				
Yes	0.502	0.264-0.954	0.035	0.633 0.312-1.283	0.204
Regular check for BP					
No	Ref				
Yes	0.579	0.316-1.060	0.077	0.862 0.432-1.719	0.673
Regular weight check-up					
No	Ref				
Yes	0.638	0.409-0.995	0.06	0.789 0.484-1.288	0.344
Adherence					
High	Ref				
Middle	0.875	0.190-4.029	0.864	0.883 0.183-4.257	0.877
Low	1.313	0.283-6.077	0.711	1.093 0.224-5.332	0.912

Discussion

Majority of patients in this study (71.5%) were females, most of the patients (57.0%) were unemployed. According to Menditto [9], women have better health seeking behavior and this may explain their large number in our study. The median age of respondents was 57 years (IQR=48-69) and most were over 50 years of age. The bulk of the patients, 88.5% and 87.6% neither smoked nor took alcohol respectively. The fact that the majority of the patients were female may explain why fewer smoke or took alcohol as seen in a Nigerian study[6] .

On blood pressure control the majority of the patients had poor control (58.7 % (n=193). Globally up to 87% of patients have inadequate control [5]. Nigeria recorded about 67.1% of patients with inadequate control[6].. However, another recent Kenyan study reported 48.3% inadequate blood pressure control. Hence, the levels can vary and probably improve depending on the the community lifestyles and the surrounding environment[10]. The majority of male patients, 69.2 % (n=65), had inadequate blood pressure control but this could change if the number could be higher or in a different community set up.

Gender was found to significantly affect blood pressure control with males having poorer control at the bivariate analysis ($p=0.013$). It was also significant at the multivariate analysis ($p=0.021$). Being a male was significantly associated with the inadequate blood pressure both at univariate and multivariate levels. This was different from a study by Ninios in a data from a Greek population where females had poorer blood pressure control [11]. In our study, single, married and divorced patients with inadequate blood pressure control were 50% (n=11), 59.6% (n=137) and 58.4% (n=45), respectively. There was no significant association between blood pressure control and marital status ($p=0.699$) as also was observed in South West Nigeria where single status was not associated with poor blood pressure control[12]. It is important to note that most patients were married in both studies.

The level of knowledge was low (score less than 6 points) among 7.6% (n=25) of the patients and good among the majority 53.3%. The rest had average knowledge. Knowledge was high specifically on taking of medication (97.3%), management of blood pressure (96.1%), danger of high blood pressure (93%), eating of less salt (89.9%), lifetime taking of medication(89.6%), and importance of regular check-up of blood pressure (88.8%). There was however low level of knowledge of at least three complications of hypertension (35.7%), normal SBP (43.8%), and normal DBP (58.1%). This was better than the report in Nigeria where 65.1% knew what hypertension meant and 55.6% knew at least two causes of hypertension and only 23.4% of respondents knew two or more complications of poor blood pressure control[6]. While most patients in this study knew of chronic hypertension, 64% of hypertensive cases in Nigeria were

expecting a cure from treatment[6]. Patients level of knowledge of hypertension was however not significantly associated with the blood pressure control at $p\text{-value}<0.05$

Majority of the patients practiced lifestyle modification to control high blood pressure where 83.9% regularly took drugs continuously in the last 6 months, 82.4% regularly checked blood pressure, while 54.9% and 79.4% regularly checked their weight and reduced salt intake, respectively. Similarly, a qualitative study conducted in Eritrea observed that the majority of patients adhered to appropriate diets due to support from family members[13]. The proportion of patients with inadequate blood pressure control was lower among those who regularly checked their weights than those who did not (53.9% vs 64.4%). Proportion of patients with inadequate blood pressure was lower among those who reduced salt intake than those who did not reduce. This was comparable to a study done in Korea where 74.8% of patients who reduced salt intake while 30.6% of patients who checked their weight had adequate blood pressure control[14].

The majority, 88.5% and 87.6% did not take alcohol nor smoke, respectively. This was different from Nigeria where over 60% of patients either smoked or took alcohol [6]. There was however no significant difference in this study between alcohol use or smoking and blood pressure control ($P=0.937$ and $p=0.306$) respectively.

The proportion of patients with inadequate blood pressure control was higher among those who irregularly took drugs in the last six months than those who regularly took drugs (71.7% vs 56.0%). Regular taking of drugs for the last 6 months was significantly associated with the blood pressure control ($p\text{-value}=0.033$). This was comparable to a study done in Nepal[8].

Conclusion

The majority of hypertensive patients in this study had inadequate blood pressure control 58.7 % (n=193). The most significant patient related barrier to adequate blood pressure control in this study was gender in which males recorded poorer control at the bivariate analysis ($p=0.013$) and at multivariate analysis ($p=0.021$). The majority of males, 69.2 %, had inadequate blood pressure control and the males were 54% more likely to be associated with the inadequate blood pressure control compared to females (AOR=0.543; 95%CI=0.323-0.914).

Regular taking of the prescribed ;'drugs for the last 6 months was significantly associated with the blood pressure control ($p\text{-value}=0.033$) at the bivariate level. The other barriers including obstacles included marital Status, inadequate knowledge, employment and duration since diagnosis did not significantly affect blood pressure control.

Hypertension related education is required especially to male patients so that there can be a change in their behaviour toward reducing the effects related to inadequate blood pressure control.

Sponsorship/Conflict of Interest

This study self-sponsored by the researchers and there was no conflict of interest in the study.

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