



A Clinical Study of acute Hypertensive urgency and Hypertensive Emergency in a Teaching Hospital

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Abstract

Hypertension is a growing problem of the century and over the last decade, the number of young patients with hypertension is found to be increasing. The incidence of hypertensive crisis is also found to be increasing. We in the present study tried to evaluate the clinical and epidemiological characteristics of hypertensive emergency presenting to our teaching hospital.

Methods: *This prospective cross-sectional study was conducted in the Department of General Medicine, Prathima Institute of Medical Sciences, Nagunur, Karimnagar. Prior Institutional Ethical committee permission was obtained for the study. Written consent was obtained from all the participants of the study. Inclusion criteria were adult patients >31 years of both sexes who were admitted to medical or emergency ICU with blood pressure readings of >180/120 mmHg. A detailed Clinical examination was done were fundoscopy, including ophthalmic examination; neurological deficits if any were identified. Laboratory investigations were done which includes hemoglobin, erythrocyte sedimentation rate [ESR], complete blood count, Renal function tests (serum urea, serum creatinine, and electrolytes), Liver function tests, serum lipid profile, serum calcium, serum phosphorus serum uric acid, Electrocardiogram, 2D Echocardiogram, PA chest radiograph.*

Results: *The mean values of diastolic blood pressure at the time of admission in hypertensive urgency were found to be 122.55 mmHg and the mean values after treatment were 88.46 mmHg a mean change of 34mmHg. In the hypertensive emergency group, the mean values at the time of admission were 130.83 mmHg and at the time of discharge, the values were 89.06 mmHg a mean change of 41mmHg.*

Conclusion: *the hypertensive crisis is found more commonly in the 6th to 7th decade of age. There is the tendency of males to have a higher incidence of hypertensive crisis. Known hypertensive with some degree of target organ damage is more associated with hypertensive emergencies. Therefore strict blood pressure control and regular evaluation of the patients is necessary to prevent morbidity and mortality due to hypertensive crisis.*

Keywords: *Hypertensive urgency, Hypertensive Emergency, Hypertensive crisis.*

Introduction

Hypertension is one leading cause of morbidity, mortality and contributes immensely to the global

burden of diseases. It has been estimated that approximately 7.5 million deaths about 12.8% of the total of all deaths. This also accounts for 57

million disability-adjusted life years or 3.7 of total DALYS^[1]. Hypertension doubles for the risk of cardiovascular disease, including coronary heart disease, ischemia, and hemorrhagic stroke, renal failure, and peripheral arterial disease^[2]. The common symptoms of patients in a hypertensive emergency with acute target organ damage are dyspnoea, chest pain, giddiness, focal neurological deficits and loss of vision^[3]. The examination of patients must, therefore, include evaluation of these symptoms to exclude hypertensive emergencies^[3]. Blood pressure in certain cases may increase rapidly and severely enough which is called Hypertensive crises. Hypertensive crisis is further divided into hypertensive urgency and hypertensive emergency^[4]. Hypertensive emergency is a situation where there is a severe elevation of Blood pressure (>180/120 mmHg) complicated by evidence of impending or progressive target organ dysfunction. Hypertensive urgencies are those situations associated with severe elevations in BP without progressive target organ dysfunction^[4]. Incidence of hypertension in the young population is increasing by the day because of a sedentary lifestyle, dietary pattern, and smoking. The prevalence of hypertension generally increases with age and more than 50% of people between age group 60-69 years will suffer from it and up to 75% of age group above 70 will be affected by hypertension^[5]. Improved diagnostic criteria and management has lead to better treatment of chronic hypertension and thus has decreased the lifetime incidence of hypertensive crisis to less than 1% of the patients with severe hypertension^[6]. Generally, hypertensive emergency will the result of non-compliance to drugs or new presentation of unrecognized essential hypertension. A hypertensive emergency is characterized by rapid deterioration of target organ function and may endanger the life if not treated immediately^[7]. Therefore with the increase in the burden of hypertension among the population, we in the present study tried to evaluate the underlying factors for hypertensive

crisis and treatment and outcome in the patients visiting our tertiary care and teaching hospital.

Material and methods

This prospective cross-sectional study was conducted in the Department of General Medicine, Prathima Institute of Medical Sciences, Nagunur, Karimnagar. Prior Institutional Ethical committee permission was obtained for the study. Written consent was obtained from all the participants of the study. Inclusion criteria were adult patients >31 years of both sexes who were admitted to medical or emergency ICU with blood pressure readings of >180/120 mmHg. Exclusion criteria: Pregnant females, patients with a history of myocardial infarction, patients unwilling to participate in the study. The selected subjects were classified as hypertensive urgency or hypertensive emergency as per JNC VII criteria. A thorough history including age, personal habits, socio-economic status, and occupation, diabetes, other medical conditions were noted. A detailed Clinical examination was done were fundoscopy, including ophthalmic examination; neurological deficits if any were identified. Laboratory investigations were done which includes hemoglobin, erythrocyte sedimentation rate [ESR], complete blood count, Renal function tests (serum urea, serum creatinine, and electrolytes), Liver function tests, serum lipid profile, serum calcium, serum phosphorus serum uric acid, Electrocardiogram, 2D Echocardiogram, PA chest radiograph. Patients with hypertensive emergencies were assessed for target organ damage like LVF, unstable angina, encephalopathy, and glomerulonephritis. All the data collected was recorded in MS Excel spreadsheet and analyzed using SPSS version 17 software on windows format.

Results

The study involved cases of hypertensive urgency (n=27) and hypertensive emergency (n=20). Out of the n=27 hypertensive urgency cases, n=18(66.66%) were male patients and

n=9(33.33%) were female patients the age-wise distribution showed most of the cases were between age group 61-70 years n=8(29.62%). In the hypertensive emergency cases out of n=20 n=13(65%) cases were males and n=7(35%) were

females and most of the cases n=8(40%) were among the age group > 70 years. The other details regarding the demographic characteristics of the cases in the study are shown in table 1.

Table 1: showing the age and gender wide distribution of the cases in the study

Age group years	Hypertensive urgency (n=27)			Hypertensive Emergency (n=20)		
	Male	Female	Total (%)	Male	Female	Total (%)
31 – 40	3	1	4 (14.81)	2	0	2 (10)
41 – 50	2	3	5 (18.51)	3	1	4 (20)
51 – 60	5	2	7 (25.92)	1	2	3 (15)
61 – 70	6	2	8 (29.62)	2	1	3 (15)
> 70	2	1	3 (11.11)	5	3	8 (40)
Total	18	9	27 (100)	13	7	20 (100)

The predominant symptoms of the patients on presentation were evaluated in both the groups. The most common symptom of cases in hypertensive urgency group was giddiness in n=17(62.96%) followed by headache in n=15(55.56%). In the hypertensive emergency,

group headache was found in n=11(55%) and giddiness was found in n=9(45%). A comparison of the results found the p-value to be significant for giddiness p (<0.05). The other symptoms in the cases of the study and p values are given in table 2.

Table 2: showing the predominant symptoms in the patients of the study

Symptoms	Hypertensive Urgency N= 27	Hypertensive Emergency N =20	P-value
Headache	15 (55.56%)	11 (55.0%)	0.25
Giddiness	17 (62.96 %)	9 (45.0%)	<0.05*
Dyspnoea	5 (18.51 %)	8 (40.0%)	0.1
Chest Pain	3 (11.11%)	5 (25.0%)	0.23
Epistaxis	6 (22.22%)	9 (45.0%)	0.6
Visual Blurring	1 (3.7%)	2 (10.0%)	0.81
Oliguria	0 (0.0%)	4 (20.0%)	-
Focal Neurological Deficits	0 (0.0%)	7 (35.0%)	-
Seizures	0 (0.0%)	2 (10.0%)	-

The most common risk factor in the cases of hypertensive urgency was dyslipidemia in n=5(18.51%), followed by diabetes mellitus in n=3(11.11%). Similarly, in hypertensive emergencies, the common risk factor was diabetes

mellitus followed by dyslipidemia in n=6 (30%) of cases. The p values were found to be significant for Diabetes mellitus between both the groups. The other risk factors and distribution is shown in table 3.

Table 3: Showing the risk factors in the cases of the study

Etiology	Hypertensive urgency N= 27	Hypertensive Emergency N =20	P-value
Diabetes Mellitus	3 (11.11%)	7 (35%)	<0.05*
Dyslipidemia	5 (18.51%)	6 (30%)	0.2
Alcohol consumption	2 (7.4)	2 (10%)	0.33
Tobacco chewing	0 (0.0)	1 (5%)	1.6
Smoking	1 (3.7%)	2 (10%)	0.59

*Significant

The mean values of systolic blood pressure at the time of admission in hypertensive urgency were found to be 192.55 mmHg and at the time of discharge, it was 136.46 mmHg a mean change of 56mmHg. In the hypertensive emergency group,

the mean values at the time of admission were 201.02 mmHg and at the time of discharge, the values were 139.43 mmHg a mean change of 62mmHg. The SBP recordings during various stages of treatment are shown in table 4.

Table 4: Showing the recording of Systolic Blood pressure during various stages of treatment

SBP recordings during various stages of treatment	Hypertensive urgency (N= 27)		Hypertensive Emergency (N =20)	
	Mean Systolic Blood pressure mmHg	Standard deviation	Mean Systolic Blood pressure mmHg	Standard deviation
At the time of admission	192.55	20.56	201.02	22.68
After one hour	182.10	18.55	189.33	19.89
At the end of 24 hours	160.23	11.07	166.5	13.33
At discharge	136.46	6.57	139.43	7.22

The mean values of diastolic blood pressure at the time of admission in hypertensive urgency were found to be 122.55 mmHg and the mean values after treatment were 88.46 mmHg a mean change of 34mmHg. In the hypertensive emergency

group, the mean values at the time of admission were 130.83 mmHg and at the time of discharge, the values were 89.06 mmHg a mean change of 41mmHg. The DBP recordings during various stages of treatment are shown in table 5.

Table 5: Showing the recording of Diastolic Blood pressure during various stages of treatment

DBP recordings during various stages of treatment	Hypertensive urgency (N= 27)		Hypertensive Emergency (N =20)	
	Mean Diastolic Blood pressure mmHg	Standard deviation	Mean Diastolic Blood pressure mmHg Mean	Standard deviation
At the time of admission	122.55	11.32	130.83	15.66
After one hour	109.23	15.40	112.52	18.74
At the end of 24 hours	95.95	10.55	97.11	12.28
At discharge	88.46	5.54	89.06	6.13

ECG findings in the patients with hypertensive emergency indicate Left ventricular hypertrophy in n=10(50%). This finding was found to be significantly present in patients with hypertensive emergencies as compared with hypertensive urgency. ST-T changes were found in n=4 (20%) patients with hypertensive emergencies. More

than one end-organ damage was found in n=8(20%) cases of hypertensive emergency. Pulmonary edema was found in n=6(30%) of cases of hypertensive emergency and the p values were found to be significant. The other details are shown in table 6.

Table 6: Showing the lab investigations and findings in the cases of study

Investigation	Hypertensive Urgency (N= 27)	Hypertensive Emergency (N =20)	P values
Electrocardiogram [ECG]			
Left Ventricular Hypertrophy LVH	1 (3.70%)	10 (50%)	<0.01*
ST-T changes	0 (0.00)	4 (20%)	0.12
Chest X-ray			
Cardiomegaly	1 (3.70%)	4 (20%)	0.33
Pulmonary edema	0 (0.00)	6 (30%)	<0.05*

*Significant

Discussion

The present study was conducted in a Teaching Medical College Hospital one of the tertiary care centers. In this study, we found the number of male patients $n=31(65.96\%)$ of patients with hypertensive crisis. Martin et al;^[8] in their study found a hypertensive crisis in 55% of male patients which indicates that there is slight male preponderance for the hypertensive crisis to occur in male patients. A similar observation was also made by and Zampaglione *et al*;^[6] with a higher number of males in hypertensive crisis. There is a greater incidence of target organ damage that occurs in male which was also revealed by Framingham study^[9] that revealed that the incidence of coronary arterial disease in men tends to increase linearly with age. In this study, the target organ damage was found in $n=8(20\%)$ cases of hypertensive emergency. Analysis of symptoms of the patients in the present study revealed the hypertensive urgency group presented with giddiness in $n=17(62.96\%)$ followed by headache in $n=15(55.56\%)$. In a hypertensive emergency, group headache was found in $n=11(55\%)$ and giddiness was found in $n=9(45\%)$. The neurological deficits in the present study were found in $n=7(35\%)$ of patients of the hypertensive emergencies they included convulsions in $n=4(20\%)$, hemiparesis in $n=3(15\%)$. Martin et al;^[8] found the presenting symptoms were of neurological deficit in 48% of cases followed by dyspnoea in 24% and chest pain in 20%. Broderick J et al; found that hemiparesis was seen in a large number of patients with neurological deficit. Sanjay VP et al;^[10] in a similar study showed the presence of hemiparesis in 75%, convulsions in 16.6% and visual deficits in 8.3% of the patients. Most of the patients $n=40(85.1\%)$ in the present study were previously known hypertensive. Some had ignored medications for the previous few days. Garcia GM et al;^[11] noticed a large number of patients, (65.9%), in their study to be previously diagnosed hypertensive. Therefore hypertensive emergencies are more likely to occur in patients with previously known

hypertension. The risk of hypertensive emergency increases in patients if they do they not adhere to antihypertensive medications^[12]. Some other factors like emotional stress and daily activities and interactions with other medications are also known to precipitate hypertensive emergency. A study of risk factors in the present study revealed in the cases of hypertensive urgency was dyslipidemia in $n=5(18.51\%)$, followed by diabetes mellitus in $n=3(11.11\%)$. Similarly, in hypertensive emergencies, the common risk factor was diabetes mellitus followed by dyslipidemia in $n=6(30\%)$ of cases. The highest recorded systolic blood pressure in the hypertensive emergency was 230 mmHg and mean systolic blood was 201.02 ± 22.68 mmHg and the highest diastolic pressure was 150 mmHg the mean was 130.83 ± 15.66 mmHg. The mean reduction of BP at the time of discharge of SBP was by 62mmHg and DBP was by 41mmHg. It was found that higher levels of blood pressure were in patients with more than one target organ damage. The investigations showed the presence of LVH more significantly in hypertensive crisis, it also showed the significant number of cases with pulmonary edema in hypertensive crisis as compared to hypertensive urgency. Patients with a hypertensive emergency are a greater risk of complications hence prompt recognition and management are essential for preventing morbidity and mortality.

Conclusion

Within the limitations of the present study, it was found that hypertensive crisis is found more commonly in 6th to 7th decade of age. There is the tendency of males to have a higher incidence of hypertensive crisis. Known hypertensive with some degree of target organ damage is more associated with hypertensive emergencies. Therefore strict blood pressure control and regular evaluation of the patients is necessary to prevent morbidity and mortality due to hypertensive crisis.

Conflict of interest: None

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