A Clinical Study of Hypertensive Emergencies

Mahesh Dave[1], Babulal Kumawat[2], Heer Nath[3]

ABSTRACT

Introduction: Hypertension is one of most common cardiovascular disorder in clinical practice. It is also called high blood pressure. Hypertension is well known risk factor for cardiovascular, renal and cerebrovascular disease. Even slightly rise elevated blood pressure lead to increase risk in cardiovascular disease and strokes (CVD). Hypertensive emergency is define as recent increase in blood pressure to a very high level (≥ 180 mmHg systolic and ≥ 110 mmHg diastolic) with target organ damage. Study aimed to evaluate the modes of presentations, clinical profile and spectrum of target organ damage in patients with hypertensive emergency.

Material and methods: This study was hospital based prospective study. The present study was carried out in 100 patients admitted in various medical wards in R.N.T. Medical College Udaipur, Rajasthan over a period of eight months. Patients fulfilling the eligible criteria were included.

Result: Among the 100 patients studied, 70 were males and the male female ratio was 2.33:1. In the age distribution, 72% patients were found age more than 50 years and rest 28% was less than 50 years. The commonest clinical presentation found was neurological deficits in 50% followed by dyspnoea in 34% and chest pain in 10% patients.

Conclusion: The present study done over hypertensive emergencies patients conclude that majority of patients belonged to the fifth and sixth decades of age and of male sex. It was commonly observed in the patients known hypertensive. Diabetes and dyslipidemias was common association observed. Commonest mode of presentation was neuro deficit and higher level of mean blood pressure at the time of presentation may associated with worst out come.

Keywords: Hypertensive Emergencies

INTRODUCTION

Hypertension is one of most common cardiovascular disorder in clinical practice. It is also called high blood pressure. Incidence of the disease are increasing day by day worldwide. Lot of contributory factor for this rise, may be modern life style, food habits, increase aging, metabolic diseases and stress. Age standardized prevalence of hypertension baseline was 73.4% for man and 72% for women. Age standardized annual incidence rate of hypertension for man was 8.6 and for women was 8.2.

Hypertension is well known risk factor for cardiovascular, renal and cerebrovascular disease. Even slightly rise elevated blood pressure lead to increase risk in cardiovascular disease and stroke (CVD). Hence it is leading cause of global burden of disease.

Hypertension may present clinically in variable form like labile hypertension, accelerated hypertension, chronic hypertension, hypertensive urgency and emergencies. Hypertensive emergency is define as recent increase in blood pressure to a very high level (≥ 180 mmHg systolic and (≥ 110 mmHg diastolic) with target organ damage (brain, heart, kidney and eye).[1,2]

Hypertensive emergencies can lead to significant increase in the morbidity and mortality and incidence is 1-3% during their lifetime (Deshmuk 2011). During past few years, despite of low incidence of hypertensive emergencies, hospitalization rate in such a patients increasing day by day because of awareness, recognition and subside diagnosis of hypertensive emergencies. Hospitalization mortality rate in hypertensive emergencies is around 2.5% and survival rate at 1 year and at 10 year is around 90% and 70% respectively (Deshmuk 2011, Lane 2009, Webster 1993).[3]

Hypertensive emergencies may present clinically in form of dyspnea, chest pain, headache, loss of vision with any focal neurological deficit. So a patient, who presented with these symptom with elevated blood pressure, we should exclude a hypertensive emergencies.

Although approach of management of hypertension is changing rapidly in last few years but still patient are presenting in form of hypertensive emergency and hypertensive urgency. Due to association of hypertensive emergency with various neurological, cardiac, renal and eye involvement, there is a urgent need of recognition of these condition to reduce morbidity and mortality in society. Hence aim of our study to find out same.

MATERIAL AND METHODS

The present study was done in patients admitted to R.N.T. Medical College, Udaipur, Rajasthan over a period of eight months.

Inclusion Criteria

- Patients above 18 years of age.
- Systolic blood pressure of 180mm Hg or diastolic blood pressure of 110 mm Hg.
- Evidence of target organ damage, either clinically or on laboratory findings.

Exclusion Criteria

- Patients less than 18 years of age.

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- Chronic renal failure, valvular heart diseases.

Hospital based Prospective study was done on 100 patients admitted to R.N.T. Medical College and Hospital with clinical and laboratory evidence of hypertensive emergency.

Study Protocol

Data was collected from 100 patients admitted to this hospital from April 2016 to November 2016, over a period of eight months. Patient who presented with an elevated blood pressure of Systolic blood pressure of ≥180 or diastolic blood pressure of ≥110 mmHg, with history suggestive of acute target organ damage were included in the study. A detailed history was taken with which included presenting symptomatology, hypertension related history with emphasis on drug compliance.

The routine investigations done in these patients were the haemoglobin, total count, differential count, erythrocyte sedimentation rate, blood sugar, serum urea, serum creatinine serum electrolytes, serum total cholesterol, serum triglycerides, high density lipoprotein, low density lipoprotein, microalbuminuria and urine analysis. All patients also underwent chest x-ray and electrocardiography. Patients with clinical suspicion of neurological deficits were evaluated with computed tomography of the brain. Patients with cardiovascular dysfunction clinically were evaluated with echocardiography and patient with renal dysfunction underwent renal sonography.

The collected data was analyzed using Microsoft Excel software.

Age (Years)	Frequency (n=100)	Percentage
30-39	8	8%
40-49	20	20%
50-59	28	28%
60-69	26	26%
≥70 years	18	18%

Table-1: Age distribution

Systolic Blood Pressure mm Hg	N	Mean	SD
At Admission	100	216	24.74
At One Hour	100	197	22.20
At 24 Hours	100	163	22.01
At Discharge	78	136	10.81
Diastolic Blood Pressure mm Hg	**N**	**Mean**	**SD**
At Admission	100	125	18.41
At One Hour	100	111	22.29
At 24 Hours	100	96	10.99
At Discharge	78	85	5.08

Table-2: Blood Pressure Measurements

RESULT

In the present study, which was done in 100 patients 70 (70 percent) were males and 30 (30 percent) were female. The male female ratio was 2.33:1. The mean age of the patients was 59.36 years. The age varied from 38 to 80 in males and 43 to 75 years in Females. The mean age for males and females were 57.65 and 63.33 years respectively (table-1).

In the age distribution, 28% patients found age less than 50 years and 72% patient found more than 50 years of age. Among the 28 patients above the age of 50 years male patient were 22 (79%) and female were 6 (21%).

In the present study the presenting symptoms in these patients were neurological deficits including convulsions visual deficits, and cardiac symptoms like chest pain and dyspnoea. The commonest presenting complaints were neurological deficits in 50 patients (50%) followed by dyspnoea in 34

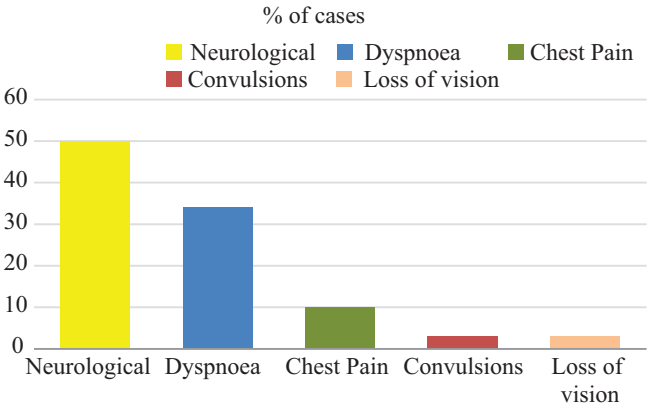

Figure-1: Presenting Symptoms

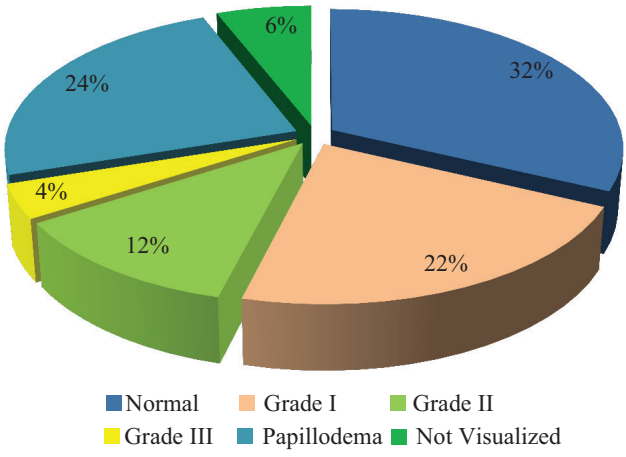

Figure-2: Fundus Examination

Systolic Blood Pressure mm Hg	Mean	SD	T	P
SBP 0hrs - 1 hour	19	20.65	6.47	0.001 VHS
SBP 0hrs- 24 hours	53	27.24	13.70	0.001 VHS
SBP 0hrs- Discharge	76	24.70	19.33	0.001 VHS
Diastolic Blood Pressure mm Hg	**Mean**	**SD**	**t**	**P**
DBP 0hr - 1 hr	14	19.23	5.24	0.001 VHS
DBP 0hr - 24 hr	30	18.51	11.32	0.001 VHS
DBP 0 hrs – discharge	37	16.61	13.91	0.001 VHS

Table-3: Variation in Blood Pressure

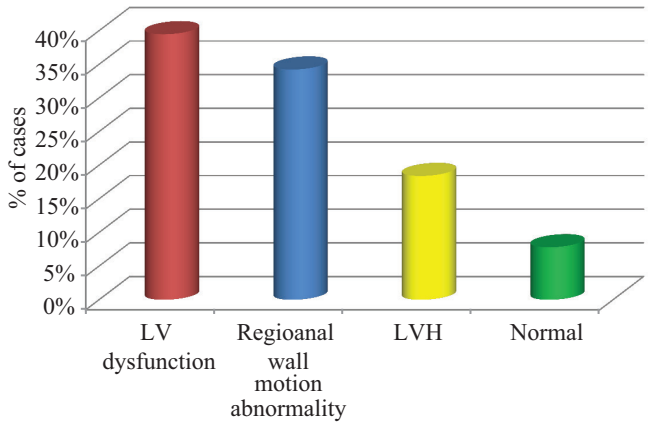

Figure-3: Echocardiography

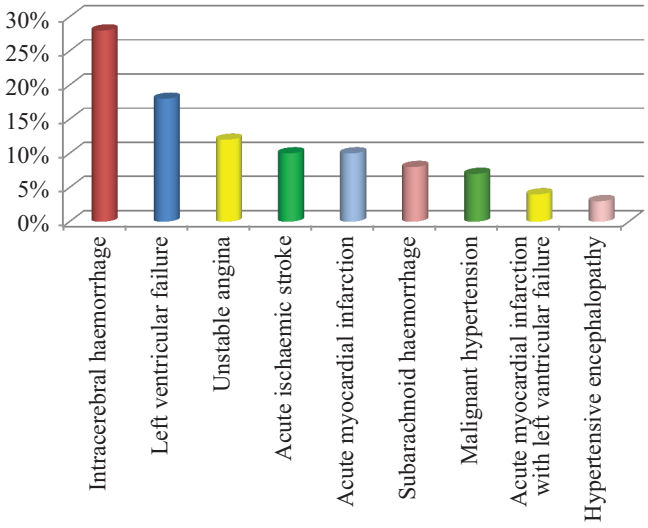

Figure-4: Target Organ Involvement

(34%) and chest pain in 10 patients (10%) (table-2). Three patients (3%) presented with convulsions and visual deficits each.

Among the total 50 patients of neuro deficit, 40 patients (80%) had hemiparesis and 2 patients had monoparesis (4%) 48 patients (96%) were in altered sensorium. 6 patients (12%) presented with convulsions and visual deficits each.

Among the 100 patients studied 60 patients (60%) were previously known hypertensives. Out of the known hypertensives, 44 (73%) were still continuing antihypertensive medications while 16 patients (27%) had discontinued. In present study, 100 patients studied, 12 patients (12%) had diabetes mellitus and 36 patients (36%) had dyslipidemia.

We measured the Blood Pressure in all admitted patients at the time of admission, after one hour of admission, at 24 hours after admission and at the time of discharge and chart given below (table-2).

Mean variation in blood pressure in these patients at the time of admission, at one hour, 24 hours and at the time of discharge are given in the table below (table-3).

The patients who were discharged from the hospital, mean systolic blood pressure were 212 mm Hg and Diastolic blood pressure of 112 mm Hg. Where in patients who expired in present study mean systolic blood pressure was 225 mm Hg and diastolic blood pressure was 137 mm Hg respectively.

All 100 patients of present study undergone fundus examination and in 32 patients (32%) had normal fundus, 22 had grade I changes (22%), 12 had grade II Changes (12%), 4 patients had grade III changes (4%), 24 of the patients had evidence of pappilodema (24%) and in 6 patients (6%) we were not able to see fundus due to local cause (figure-2).

Clinical examination revealed evidence of left ventricular failure in the form of left ventricular S3 or basal crepitations or frank pulmonary oedema in 50 patients (50%).

Chest radiograph was suggestive of cardiomegaly in 14 patients and 10 patients had signs of pulmonary oedema. Chest radiograph was normal in 76 patients.

Out of 100 patients 52 patients (52%) had ST segment of T wave abnormalities, 20 (20%) had ECG with voltage criteria suggestive of LVH and 4 patients had both the changes.

Echocardiography done in 76 patients with evidence of cardiac dysfunction showed regional wall motion abnormality in 26 patients (34.2%), left ventricular dysfunction in 30 patients (39.47%), left ventricular hypertrophy in 14 patients (18.4%) and normal echocardiographic study in 6 patients (7.8%) (figure-3).

The above study done in 100 patients showed 52 patients (52%) had abnormal renal function test, out of which 24 patients (24) had elevated urea, 18 patients (18%) had elevated serum creatinine and rest 10 patients (10%) had elevated urea and creatinine both.

52 Patients who had abnormal renal function test undergone ultrasonography examination and found 9 patients (17.3%) had grade1 renal parenchymal disease (RPD) and 6 patients (11.53%) renal parenchymal grade2.

All 100 patients of present study undergone serum electrolyte estimation and found 32 patients (32%) with hyponatremia and 12 patients (12%) had hypokalemia and 4% with hyperkalemia. Rest 52 patients (52%) had normal electrolyte. Microalbuminuria was seen in 36 patients (36%).

In the present study in all these 100 patients were assessed for end organ damage and found 46 patients had neurological target organ damage, 44 patients (44%) had cardiac organ damage, 3patients (3%) had hypertensive encephalopathy and 7 patients (7%) had malignant hypertension. For further evolution in 46 patients of neurological target organ damage, intracerebral hemorrage was found in 28%, subarachnoid haemorrhage (8%), acute ischaemic stroke (10%) and cardiac target organ damage were in form of acute myocardial infarction (10%), unstable angina (12%), left ventricular failure (18%), acute myocardial infarction with left ventricular failure (4%) (figure 4).

Present study was carried out in 100 patients with hypertensive emergencies, out of which, 22 patients (22%) died during hospitalization and rest 78 patients were discharged. Hence hospital mortality rate was 22%.

DISCUSSION

Present study was conducted in 100 patients admitted with hypertensive emergencies in various medical wards of

R.N.T. Medical College, Udaipur, Rajasthan and found male and female ratio was 2.3 : 1. Male were 70% and female were 30%.

The study done by Martin et al and Zampaglione et al showed similar type result of male preponderance in hypertensive emergencies patients. This is probable due to increased susceptibility of male to hypertension related target organ damage.[4]

On the basis of clinical presentation we found 50% had neuro deficit followed by 34% patients dyspnoea and 10% patients with chest pain. Similar thing was observed by Martin et al, who found neurological deficits, dyspnoea and chest pain in 48%, 25% and 18% respectively. Zampglione et al found the most common presentation as chest pain (27%) followed by dyspneoa (22%) and neurological deficit (21%).[4-6]

In the present study, when we further analysed in neuro deficit group, we found hemiparesis in (80%), altered sensorium in (96%), convulsions (12%), and visual deficits (12%) and monoparesis 4%. Altered sensorium followed by hemiparesis was found the common presentation in these study.

In the present study, we found 60% patients were known hypertensive. Martin et al also noticed same result and it was in 83% of patients. Study done by Zampaglione et al showed further higher result and it was 92% patients. The above evidence confirms that hypertensive emergencies were more common in previously known hypertensive patients.[4]

Present study carried out in 100 patients, 60% patients were known hypertensive. Out of which 27% patients discontinued their antihypertensive medications which could have put them at a higher risk for acute target organ damage and hypertensive emergency.

Diabetes mellitus and dyslipidemia were two other risk factors commonly associated with hypertension and in present study we found 12% patients had diabetes and 36% patients with dyslipidemias.[5-8]

The present study was done in 100 patients, we found highest recorded systolic blood pressure was 280 mm Hg with mean systolic blood pressure of 216±25 mm Hg. The highest diastolic blood pressure recorded was 180mmHg with a mean of 126±18 mm Hg. Martin et al reported the same result in form mean systolic blood pressure of 193±26 mm Hg and a mean diastolic blood pressure of 129±12 mm Hg.[6,7]

In the present study, 100 patients were registered undergone fundus examination and found 70% had abnormal fundus in form of 22% had grade1 retinopathy, 12% were grade2 retinopathy, 4% had grade3 and 32% had papilloedema. In 6% patients fundus examination was not possible due to local eye cause.[8]

Renal dysfunction was seen in 42% patients in form of raised serum urea in 24% patients, creatinine were in 18% patients and raised urea and creatinine were found in 10%. In the present study electrolyte imbalance were observed in 58% patients and it was in the form of hyponatremia in 32% patients, hypokalemia in 12% and hyperkalemia in 4%.

In the present study, we found microalbuminuria in 36% patients. Palatini P. curr observed microalbuminuria ranging 4.6 to 46% in his study. He also correlated risk factor in prognostification of above the disease.[9]

In the present study most common presentation in hypertensive emergencies patients was neurodeficit groups (50%). These patients under went Computed tomography and it was observed that intracerebral hemorrhage (28%) was the commonest cause followed by cerebral infarct (10%) and subarachnoid hemorrhage (8%).

All these patients of study under gone electrocardiogram and echography and found abnormal in 76% patients, out of which 52% had ST-T changes.

A study done by Lip GY et al on complications and survival of 315 patients with malignant phase hypertension found low median survival time in patients with proteinuria and high serum urea and serum creatinine levels at presentation and if left ventricular hypertrophy was detected on electrocardiogram.[38] These findings in a patient in hypertensive emergency situation may help in prognosticating these patients.[5]

Present study carried out in 100 patients, the target organ damage, we found was intracerebral hemorrhage in (28%) followed by left ventricular failure (18%), unstable angina (12%), acute myocardial infarction (10%) acute ischaemic stroke (10%), subarachnoid haemorrhage (8%), malignant hypertension (7%), acute myocardial infarction with left ventricular failure (4%) and hypertensive encephalopathy (3%) respectively.

Zampglione et al observed target organ damage in the form of Intracerebral haemorrhage (4.5%) left ventricular failure (23%), Acute ischaemic stroke (24%) in their study.[4]

Study by Martin et al showed intracerebral haemorrhage (17%), left ventricular failure (25%), acute ischaemic stroke (39%) and acute myocardial infarction in (8%) their patients.[6]

The outcome of the study showed an in-hospital mortality of 22% among these patients.

CONCLUSION

The present study done over hypertensive emergencies patients conclude that majority of patients belonged to the fifth and sixth decades of age and of male sex. It was commonly observed in the patients known hypertensive. Diabetes and dyslipidemias was common association observed. Commonest mode of presentation was neurodeficit and higher level of mean blood pressure at the time of presentation may associated with worst out come. Hyponatremia and hypokalemia was commonest electrolyte abnormality observed and intracerebral hemorrhage was commonest target organ damage seen. The mortality rate observed in present study was 22%.

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