



Original article

A Study on the Etiological and Clinical Profile of Hypertensive Emergency in a Tertiary Care Hospital, Kishanganj, Bihar - A Cross -Sectional Study

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Introduction

Systemic Hypertension is a common medical condition affecting over 1 billion people worldwide¹. Among the population considered, the prevalence is found to be 24%, for which the people are affected with hypertension. The significant mortality affecting cardiovascular, cerebrovascular and renal is mainly due to hypertension and its emergencies. The treatment strategies focussed on hypertension are mostly associated with the urgency and emergency. A hypertensive emergency is characterized by rapid deterioration of target-organs and poses an immediate threat to life. The reduction in mortality of hypertension emergencies is associated with focus on the early detection of end organ damage caused due to factors leading from hypertension.

This study provides a view on hypertensive emergencies, focusing on one of its most serious complications: hypertensive emergency; a serious condition in which blood pressure undergoes an elevation >180/120 mm Hg, and is associated with end organ dysfunction (e.g. heart, kidneys, eyes or

brain). The most common clinical presentations of hypertensive emergencies are cerebral infarction (24.5%), pulmonary edema (22.5%), hypertensive encephalopathy (16.3%) and congestive heart failure (12%). Other clinical presentations associated with hypertensive emergencies include intracranial haemorrhage, aortic dissection and eclampsia.

Hence we undertake the study to prospectively find the relationship between etiological profile and clinical profile that correlates mortality and thereby trying to predict the prognosis of the type of end organ damages.

Before we discuss various modalities and clinical picture, we should know the difference between various terms that deal with hypertension, that include

1. Hypertensive urgency, characterised by raise in systolic BP >180/diastolic BP >120, with no end organ damage.

2. Malignant hypertension, a condition associated with retinal papilledema along with encephalopathy, confusion, left ventricular failure, intravascular coagulation and impaired

renal function. The pathological hallmark of malignant hypertension is histological appearance of fibrinoid necrosis.

Objectives

1. To study the various etiology of the patients with hypertensive emergencies.
2. To study the clinical profile and range of target organ damage in patients with hypertensive emergencies.
3. To study the mortality and morbidity pattern of hypertensive emergencies and its statistical significance.

Study Design

A cross sectional (observational) study.

Study Place

The study was conducted at dept. of general medicine, MGM&L SK Hospital, Kishanganj, Bihar.

Study Population

The target population consists of patient with the diagnosis of newly detected hypertension either admitted as in ward or outpatient between February 2022 to January 2023.

Sample size: n=300

Results and Analysis

Sociodemographic Profile

Age: The study shows that the age group ranges from 26-80yrs.

The median age group is 61.8 yrs. Among those people in the study, 115 were males and 185 were females.

Age Frequency

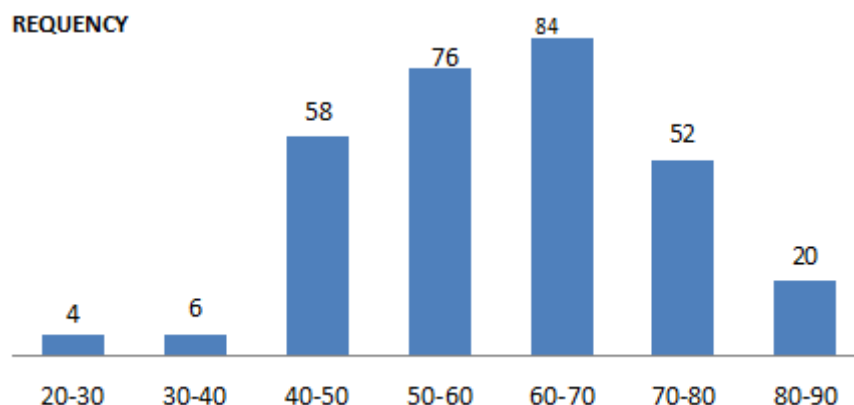


Figure.1: The Decade Wise Distribution of Age Etiological Profile

Lifestyle: 158 patients had regular physical activity (52.6%) and 142 patients had sedentary lifestyle, and are seen associated with very less physical activity (47.3%).

Hypertensive Status: 218 patients medical history was taken and was found to be known hypertensive (72.6%). The hypertensive status of rest of the patients were not known, because of improper medical history. Out of 218 hypertensives, only 64 patients were taking regular antihypertensive treatment (29.73%)

Diabetes Mellitus: 108 patients were known diabetic (36%). Out of 108 patients, 38 patients were taking regular medications. (35%)

Smoking: 180 patients were known to have history of smoking, either regular or irregular smokers (60%)

Alcoholism: 80 patients were known alcoholic (26.6%)

Clinical Profile Presenting Complaints

Among the study group, 104 patients (34.6%) had chest pain as initial presenting complaint usually radiating towards left side, and 68(22.6%) of patients presented with history of dyspnea, and 44 (14.6%) presented with paroxysmal nocturnal dyspnea, 90(30%) patients had focal neurological deficit at the time of presentation.when discussed about the neurological complaints, 84

patients presented with hemi paresis and 6 patients presented with monoparesis. Sensory abnormalities were found only in one patient (Thalamic Hematoma). Eight patients presented with history of seizure (5.3%) and 72 patients presented with history of LOC (24%). Among the co morbidities, 88 patients had past history of Chronic Kidney Disease (14.6%), 88 patients had past history of Coronary Artery Disease (14.6%).

Table.1: Blood pressure values

	N	Minimum	Maximum	Mean	Std. Deviation
SBP	150	180	280	200.00	21.921
DBP	150	120	160	124.80	6.525
Valid N	150				

Systolic Blood Pressure

204 patients had blood pressure in the range of 180-190 mmHg (34%)

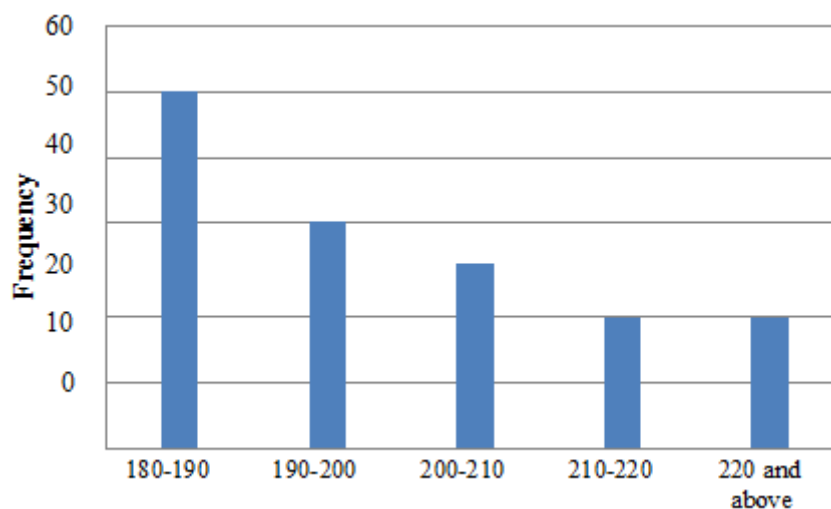


Figure.2: Systolic blood pressure

Diastolic Blood Pressure

Diastolic BP range in most of the patients was 120-130 mm Hg (23.3%).

Pulse Pressure

Pulse Pressure range in most of the patients was 50-60mm Hg (30%).

Fundoscopy findings

All patients were subjected to fundoscopic examination. Fundoscopy findings of grade 3 and grade 4 had statistically significant association

with elevation of systolic blood pressure.42 patients with diastolic blood pressure ≥ 120 mm Hg had evidence of Retinopathy on Fundoscopy.14 of them had grade 3 and 4 changes on fundoscopy.

Laboratory values

Among the patients who underwent various investigations, 86 patients had microalbuminuria (28.6%) and 220 patients had a Creatinine value less than 2mg/dl and Serum Creatinine value was more than 2 mg/dl in 80 patients. Severity of systolic blood pressure had a statistical significant

association with serum Creatinine elevation (p value 0.00). Hyponatremia was found in majority of patients as 28% and Hypokalemia was found in 14%, Hyperkalemia seen in 10% only. Troponin I assay was done in patients with symptoms and ECG changes suggestive of acute coronary syndrome. Trop I positivity found in 41

patients (77 %). Chest X Ray revealed cardiomegaly is found in around 24 patients and hilar prominence was found in 22 subjects and widened Mediastinum was found in two subjects. ST/T changes were found in 98 patients. (32.6%). LVH voltage criteria was found in 32 patients (10.6%).

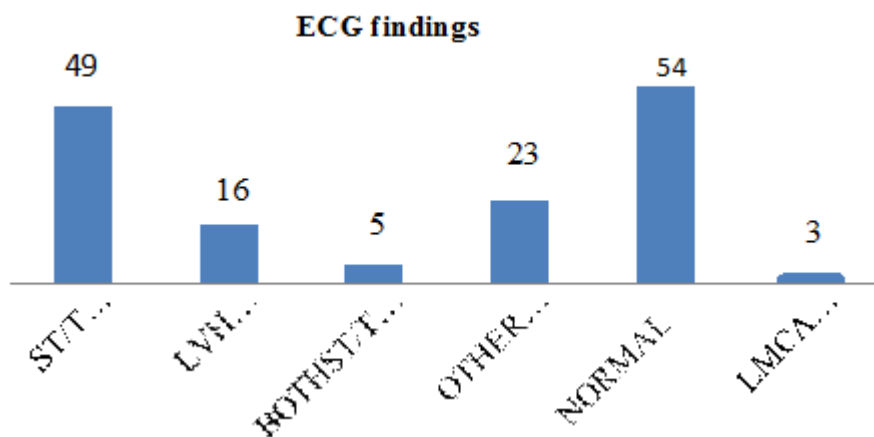


Figure.3: ECG Changes

Renal Ultrasonogram: Renal ultrasonogram was done in all the patients. 42 patients had grade 1 changes in ultrasonogram. 40 patients had grade 2 changes in ultrasonogram.

Echocardiography: 46 patients had abnormalities in regional wall motion. 36 patients had left axis deviation indicating left ventricular hypertrophy.

CT findings: The most common finding as per imaging was intracerebral hemorrhage (52%)

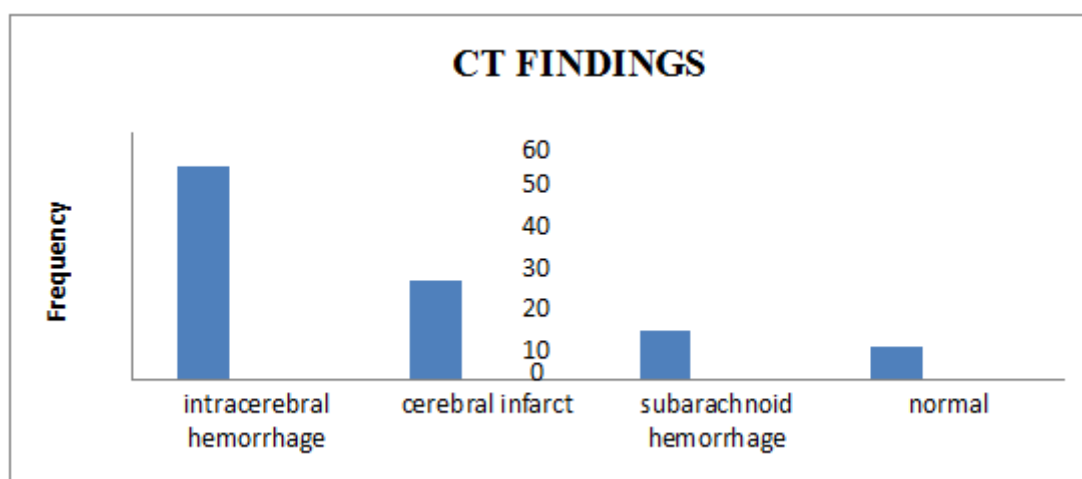


Figure 4: CT Head finding

Routine Investigations

The study proves that the factors having significant mortality are

1. Raised serum creatinine values more than 2mg/dl.

2. Trop-t positivity values.
3. Microalbuminuria.
4. Echocardiography findings like regional wall abnormality.

Diagnosis

The most commonly involved target organ damage is cardiovascular, presenting as acute coronary syndrome (35%).

From the above data it is found that the highest mortality is associated with intracerebral bleed, followed by acute coronary syndrome, where cerebral infarct is least associated.

Review of Literature

Age Distribution: The normal age of end organ damage in the present study was the highest in 7th decade (mean age 62.34+/-13.428). The study done by Sanjay Gulhane et al on clinical profile of hypertensive emergencies⁶ states that the frequency of target organ damage was found to be highest in 7th decade (mean age 64.79+/-8.23). The age range in the present study was 28 to 90 years. The study is seen that females are more affected than males. In the present study, when we started analysing the gender predominance, most of the males presenting with hypertensive emergencies were found to be mostly older than 55 years.

The majority of patients belonged to post-menopausal age group which shows susceptibility of postmenopausal age group to organ damage.

The Etiological Profile

Hypertensive Status: Majority of the patients with hypertensive emergencies were known hypertensives (74%) with irregular medication.

The categories of secondary hypertension found were renal parenchymal diseases (12%), acute glomerulonephritis (.8%) renal artery stenosis (.8%). In present study, 22% of known Hypertensive's ignored their hypertensive status and discontinued hypertensive medications which might have worsened their target organ damage.

The major co-morbidities present in our study were diabetes mellitus and dyslipidemia. Diabetes was present in 36% of patients and dyslipidemia was found in 27.3% of patients and 25% patients had dyslipidemia. In the study done by martin et al⁷, 26% of patients had diabetes mellitus. With more studies coming in, the etiologic link between

insulin resistance and arterial hypertension is becoming more evident.

Lifestyle

In our study we found that sedentary life style has more significant mortality in relation to more physical activity.

Clinical Profile

Analyzing the present data, the presenting complaints related to various target organ damages were chest pain (32.6%) followed by focal neurological deficit (30%), loss of consciousness (22%) and dyspnoea (24%). Guilano et al in his study found chest pain in 28.4% followed by focal neurological deficit (26%).

The highest recorded systolic blood pressure was 280 mmHg with mean systolic blood pressure 200±22.821 mmHg. Highest diastolic blood pressure was found to be 160 mmHg with a mean of 122.8±6.525mmHg. It is found the mean systolic blood pressure to be 192 mm hg with standard deviation of 26mmHg and mean diastolic blood pressure 126 mmHg with a standard deviation of 14 mmHg respectively.

In our study, fundoscopy findings were as follows. 62 patients showed grade 1 changes; normal in 94 subjects (31%). Papilloedema present in 80 patients (20%). Sanjay et al⁶ found that fundoscopic evaluation was normal in 30% of subjects, followed by grade 1 changes (20%), grade 2 changes (24%), grade 3 changes (13%) and papilloedema in 4%.

Laboratory Findings and Investigations

In the present study, 26% of the people have microalbuminuria. In our study, 24% of patients had serum creatinine value more than 2 mg/dl. In the present study, 10% of patients had hyperkalemia compared to 12% with hypokalemia, reflecting secondary aldosteronism from increased rennin secretion induced by intrarenal ischemia. Computed Tomography findings showed that the commonest cause for

neurological damage is intracerebral haemorrhage followed by cerebral infarct. In the present study, echocardiography shows regional wall motion abnormalities in 46 patients (43.3%) and left ventricular hypertrophy in 36 patients (33.3%), where both of them have significant mortality.

Target Organ Damage

Evaluation of target organ damage showed that acute coronary syndrome was the commonest type (32%) followed by cerebrovascular accident-intracerebral bleed (24.3%) and acute ischemic stroke (9.2%). It is found acute coronary syndrome in 25.1%, followed by ischemic stroke in 24.9% and hemorrhagic stroke in 16.8%.

Risk factors and mortality status

In our study, it was found that diabetes was associated with mortality (p value <0.04). The study shows that non-adherence to medication is one of the major factors contributing to mortality.

Clinical profile and Mortality Status

The study shows that chest pain is one of the major contributing factors for mortality.

It is seen that dyspnoea has no much association with mortality. The present study shows that mortality is closely associated with focal neurological deficit.

Among all the features, the mortality is most closely associated with loss of consciousness, and if it is presenting complaint is also has statistical significance. The study shows that if the patient has depressed sensorium, then it is closely associated with mortality.

Clinical signs and mortality status

The present study shows that the range of mortality is associated with the severity of hypertension (p value 0.001). The present study shows that both the systolic and diastolic pressures are involved in mortality. Not only systolic and diastolic pressures, pulse pressure also has significant role in mortality. The mortality correlates with the grade-3 and grade-4 retinopathy changes. According to the above

study, death in grade 3 retinopathy was 16% and death in grade 4 retinopathy was 18.4%.

A study done by Lip G.y et al¹⁴ on complications and survival of 315 patients with malignant hypertension are mainly associated with raised urea and creatinine and also have low median survival time. Microalbuminuria had statistical significance in terms of mortality in the present study (p value 0.016).

The association of creatinine with the mortality is seen with a raise of values more than 2mg/dl. Lip G.y et al found that patients among all the patients presented with accelerated hypertension are seen with the raised creatinine values. The study showed that percentage of patients with acute severe hypertension having chronic kidney disease was 31.7% on admission. The mortality correlates with the chronic kidney disease.

Echocardiographic findings had a statistical significance in terms of mortality (p value 0.008). In our study it is seen motion abnormality is associated with raised mortality. The study of Bal.k Sharma regional wall abnormalities are also seen with raised mortality.

The study we discussed about hypertensive emergency showed that patients mainly with acute stroke as target organ damage had a statistically significant association with mortality. Patne et al¹⁵ found that when the patient presents with high blood pressure at the time of presentation, have adverse outcome and was statistically significant.

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