



A Clinical Profile of Patient Admitted with Hypertensive Emergencies Presenting to the Emergency Medicine: A Cross Sectional Study

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Date of Submission: 01-12-2023

Date of Acceptance: 10-12-2023

ABSTRACT

Background: With the aim to avoid irremediable target end organ damage, hypertensive emergencies are among the periodic presentations in the emergency room. It is imperative that these cases are promptly identified, evaluated, and treated. These clinical symptoms, which are common causes of patient visits to healthcare facilities, are the result of untreated or insufficiently treated hypertension. The aim is to study the clinical presentations of patients, with hypertensive emergency presented to the department of emergency medicine.

Materials and methods: It is a prospective observational study done during the period between May 2023 to October 2023 at Sri Venkateshwara Institute of Medical Sciences, Tirupati. All patients who were more than 18 years with blood pressure >180/120 mmHg to the emergency department were included. A detailed history, clinical examination was done and necessary investigations was sent to the laboratory.

Results: The study results indicate that males (74.3%) were significantly over represented compared to females (25.7%). Out of 70 patient's majority of the subjects belonged to age group of 61-80 years followed by 41-60 years. Out of 70 patients most common symptom is dyspnoea (58.6%), Headache (44%), Giddiness (41.4%), Vomiting (40%), Visual Deficit (37.1%), Chest pain (31.4%), Loss of consciousness (27.1%), Altered sensorium (22.9%). Out of 70 patient's majority of them were Smokers (68.6%) and Alcoholics (58.6%). Out of 70 patients 50% had neurological involvement, 27.1% had respiratory involvement and 25.7% had cardiology involvement.

Conclusions: The present study concludes that majority of patients presenting with hypertensive

emergencies were belonged to four to eight decades of age. Preventing end organ damage and lowering mortality and morbidity can be achieved by promptly diagnosing hypertensive situations and administering the proper medication.

Key words: Hypertensive Emergency, Neurological dysfunction, Systemic Hypertension.

I. INTRODUCTION:

Globally, hypertension is becoming a significant public health issue. According to a recent assessment on the prevalence of hypertension worldwide, in 2000 there were around 1 billion adults (more than 25% of the global population) who were estimated to have hypertension; by 2025¹, that number is expected to rise to 1.56 billion. People with hypertension can be found in all social backgrounds and age groups, including teenagers. Hypertensive emergencies, a subgroup of hypertensive crises, are characterized by acute, severe elevations in blood pressure, of to-greater than 180 / 110 mm Hg (typically with systolic blood pressure [SBP] greater-than 200 mm Hg and / or diastolic blood pressure [DBP] greater-than 120 mm Hg) associated with the presence or encumbrance of target-organ dysfunction². Blood pressure and the chance of experiencing events related to cardiovascular disease are continuously correlated, stable, and unaffected by other risk variables.

Damage to target organs caused by hypertension includes damage to the kidneys, heart, brain, and eyes³. Numerous symptoms related to the heart, lungs, and nervous system are linked to individuals experiencing hypertension emergencies that involve target organs. The most typical symptoms that individuals with acute target organ impairments associated to hypertension present with include focal neurological deficiency,



dyspnea, headache, chest pain, and temporary loss of vision². When a patient exhibits any of these symptoms and signs together with increased blood pressure, the doctor should do a thorough evaluation to rule out a hypertensive emergency. Despite significant advancements in the management of hypertension, patients continue to present with hypertensive emergencies and crises. This constitutes around 25% of all medical emergencies and urgencies⁴. Undiagnosed essential hypertension, medication noncompliance, or a fresh onset of untreated hypertension can all lead to hypertensive emergencies. Physiological factors that aim to damage organs and quickly raise blood pressure can potentially be the cause.

A hypertensive emergency is defined by the target organs fast deterioration and cause an immediate risk to life. Before the development of antihypertensive medications, these problems were broadly worse¹. Additionally, a far higher frequency of hypertensive episodes is observed⁵. In order to lessen the burden of hypertensive emergencies in terms of increased morbidity and mortality in our society, it is imperative that this disease be recognised. Hypertensive emergencies have been linked to a number of cerebral, renal, and cardiac issues.

AIM & OBJECTIVES:

1. The aim is to study the clinical presentations of patients, with hypertensive emergency presented to the department of emergency medicine.
2. To study the radiological parameters in patients with hypertensive emergencies presenting to the department of emergency medicine

II. MATERIAL & METHODS:

A prospective observational study was conducted in Sri Venkateshwara Institute of Medical Sciences a tertiary care hospital from May 2023 to October 2023 for a period of 6 months. All patients who were more than 18 years who presented to the hospital with blood pressure

>180/120mmHg to the emergency, outpatients, and inpatients were included. A thorough history was taken and clinical examination was commenced at the time of admission and all these conditions were diagnosed clinically by the appropriate diagnostic tests (Complete blood picture and complete urine examination, lipid profile, fundus examination, ECG, chest X ray PA view). Patients with clinical suspicion of neurological deficits was evaluated with computed tomography of the brain. Patients with cardiovascular dysfunction clinically were evaluated with echocardiography and patient with renal dysfunction underwent renal sonography. Blood pressure was recorded by using mercury sphygmomanometer in these patients at the time of admission, after one hour and patient was shifted to respective departments within 6 hours.

Inclusion criteria

- Patients greater than 18 years of age.
- Patients with Blood pressure greater than 180/120mmHg

Exclusion criteria

- Patients who are pregnant.
- Patients less than 18 years of age

III. STATISTICAL ANALYSIS

Data will be recorded on a structured proforma and data entry and analysis were done using Windows Excel 2019 (Windows Corporation, Redmond, WA). All the entries will be double-checked for any possible error. Descriptive data was presented as Mean \pm Standard deviation and frequencies and percentages for categorical variables were analysed by chi-square test and student t test. p value of 0.05 or less was considered as statistically significant.

IV. RESULTS:

In our prospective observational study out of 70 patients, age group of 56-65 were 30% followed by 46-55 were 24.3% followed by 66-75 were 14.3% followed by 36-45 were 12.8% followed by 76-87 were 11.4% followed by 18-35 were 7.2% age group. (Table: 1)

Table: 1 showing age group wise distribution

Sno	Age Group	Number of Patients	Percent (%)
1	18-35	5	7.2
2	36-45	9	12.8
3	46-55	17	24.3
4	56-65	21	30
5	66-75	10	14.3
6	76-87	8	11.4



Out of 70 patients presented with hypertensive emergencies 74.3% were males and 25.7% were females. The average mean \pm SD and range of age was 57.57 ± 14.10 (27-87).

Out of 70 patients presented with hypertensive emergencies most common symptoms

were dyspnoea (58.6%) followed by giddiness (41.4%), vomiting (40%), visual deficit (37.1%), chest pain (31.4%), loss of consciousness (27.1%) and altered sensorium (22.9%). (figure:1)

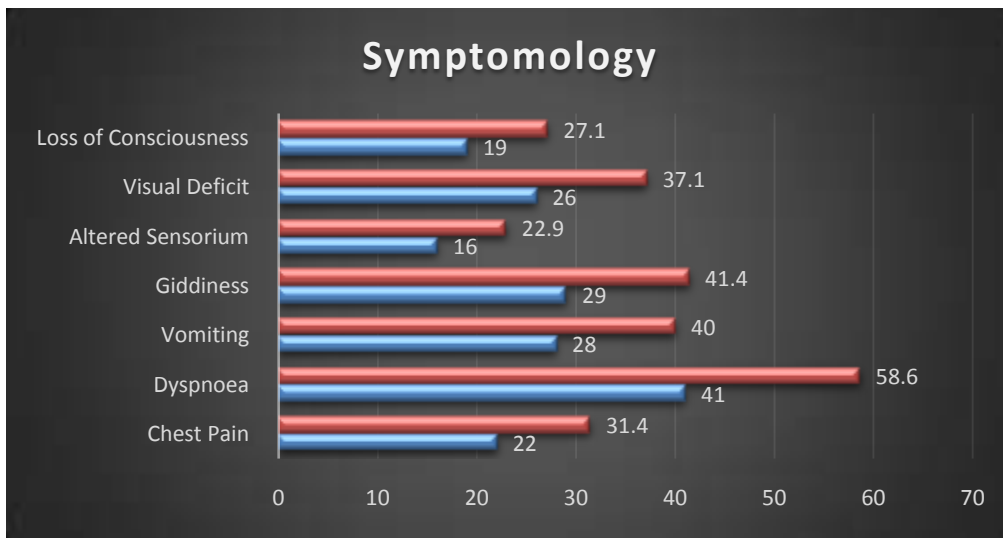
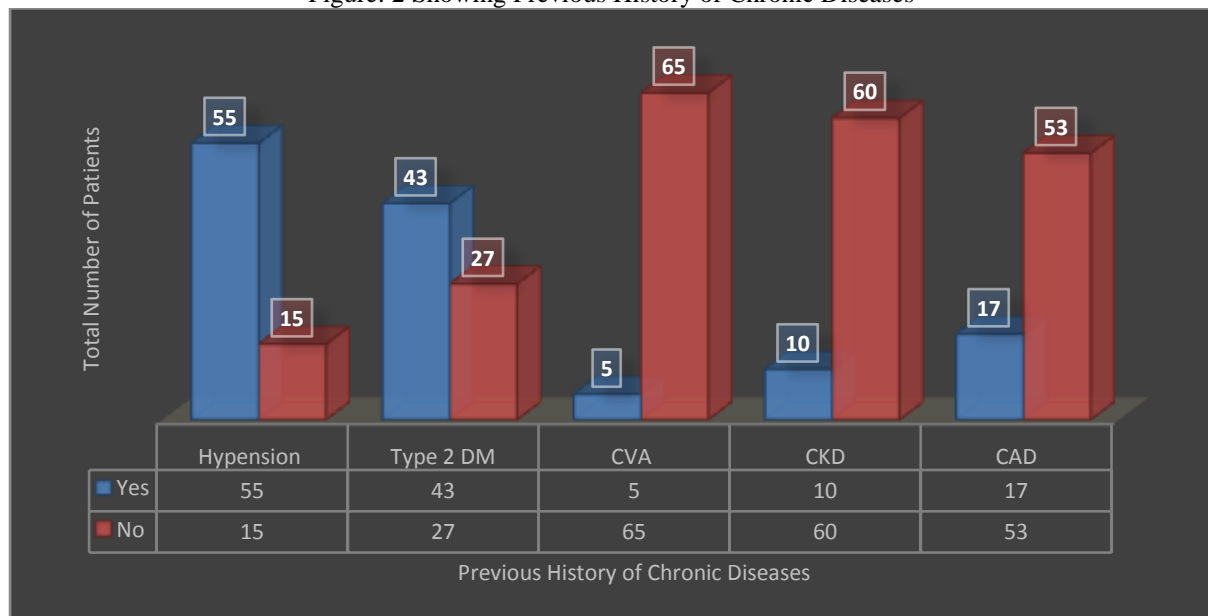


Figure:1 Showing Symptomology of patients presented to Emergency Department

Out of 70 patients presented with previous history of chronic illness 78.6 % were systemic hypertension followed by 61.4% were Type 2 diabetes mellitus, 24.3% were chronic

kidney disease, 14.3% were coronary artery disease, 7.1% were cerebrovascular accident. (Figure: 2)

Figure: 2 Showing Previous History of Chronic Diseases



According to (Figure: 3) 58.6% of patients were alcoholics and 68.6% of patients were smokers.

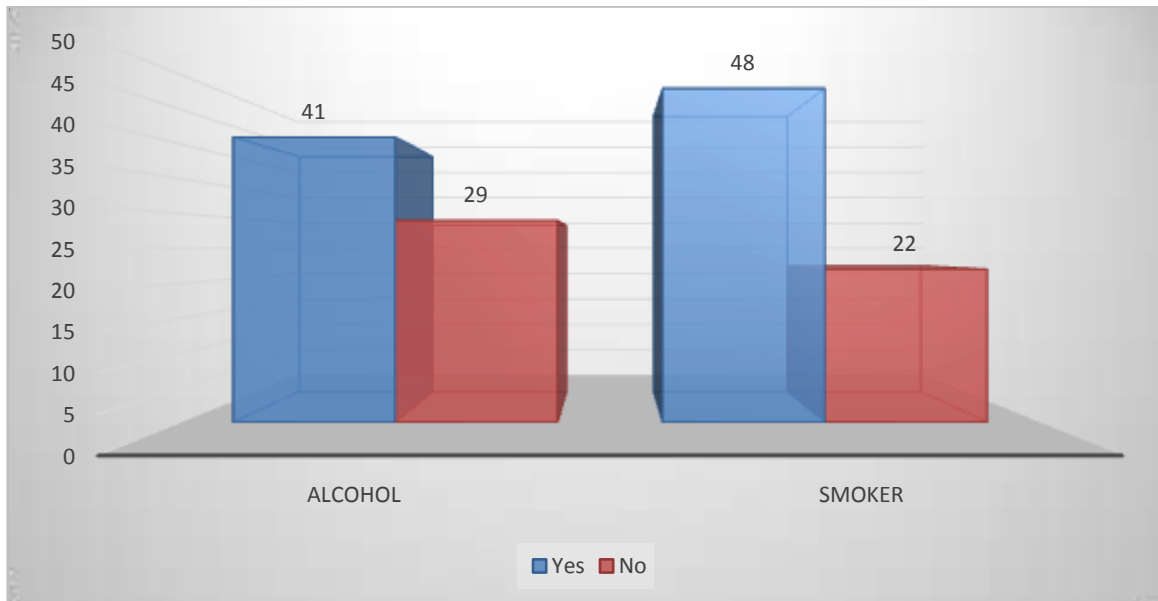


Figure: 3 Showing patients with alcoholics and smokers

Figure: 4 shows that 27.1% were having pallor, 41.4% with pedal edema and 1.4% with icterus.

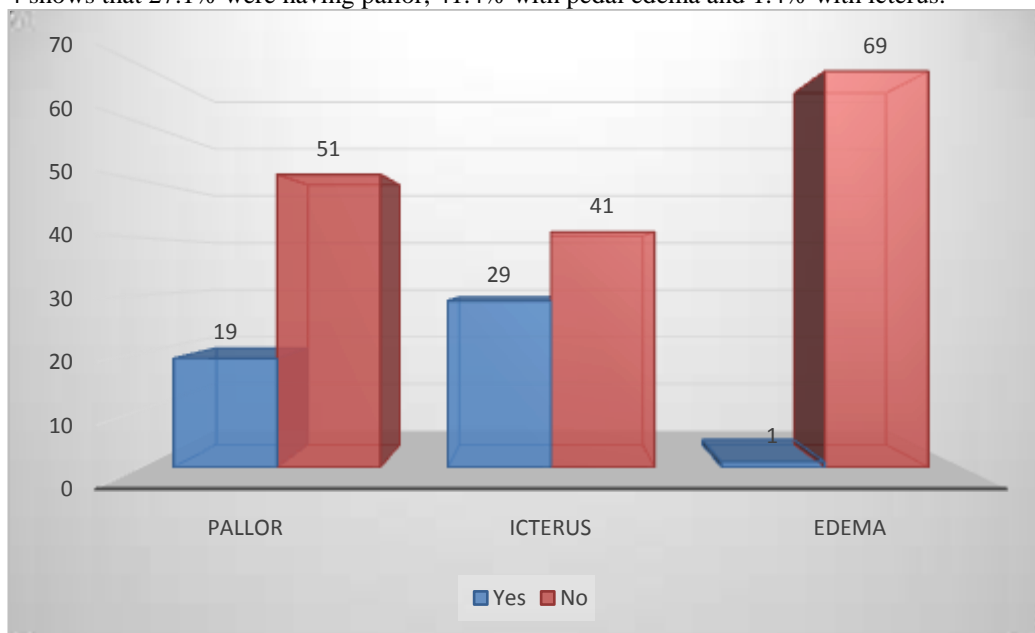


Figure: 4 Showing General examination of patients with Hypertensive emergencies

Table: 2 Shows Association between previous chronic illness vs Blood pressure at admission & at 1st hour after treatment

Sno	Condition	Blood Pressure	At Admission	At 1 st Hour	p Value
1	CHRONIC KIDNEY DISEASE n=17	SBP	192.9±13.11	170 ±13.22	0.00
2		DBP	108.8±15.36	94.11±6.18	0.01
3	NEUROLOGICAL DEFICIT N=35	SBP	198±15.24	168.8±13.67	0.05
4		DBP	109.25±19.35	93.37±13.76	0.034
5	CORONARY ARTERY DISEASE N=10	SBP	193±19.4	165.4±15.14	0.001
6		DBP	106±19.55	93.8±8.81	0.115



Table: 2 shows that association between systolic blood pressure (SBP) and diastolic blood pressure (DBP) of neurological deficits, chronic kidney disease during admission and 1st hour is statistically significant. But the association between DBP of coronary artery disease during admission and 1st hour were not significant.

Out of 70 patients presented with hypertensive emergencies 65.4% were having normal ECG followed by 23.8% were having ST changes, LVH Pattern (2.8%) followed by, Poor R progression, premature ventricular contraction, sinus bradycardia, sinus tachycardia, absent q wave in v1-v5&v6 were 1.4% each. (Table: 3)

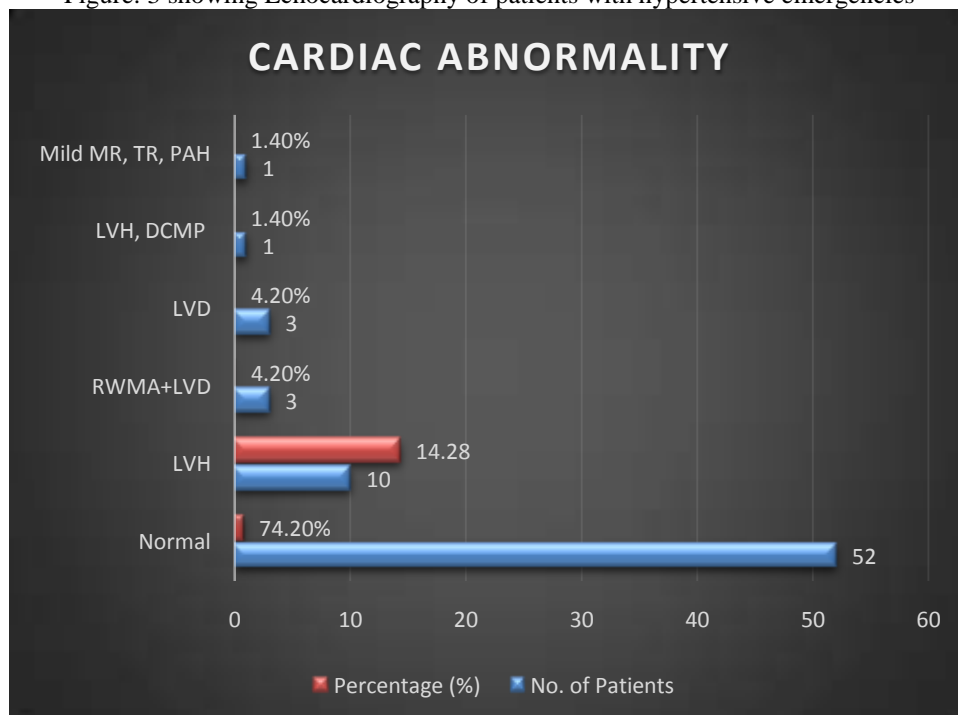
Table:3 Showing ECG Changes in Patients Presenting with Hypertensive Emergencies

ECG	No. of Patients	Percentage (%)
Normal	46	65.4%
Absence of Q wave in V ₁ , V ₅ & V ₆	1	1.4%
LVH Strain Pattern	2	2.8%
Poor R Progression	1	1.4%
Premature Ventricular contraction	1	1.4%
Sinus Bradycardia	1	1.4%
Sinus Tachycardia	1	1.4%
ST- T Changes	17	23.8%

Figure: 3 shows that out of 70 patients 74.2% were having normal echocardiography followed by 14.28% were having left ventricular

hypertrophy followed, RWMA + LVD (4.2%), Left ventricular dysfunction (4.2%), LVH+ DCMP (1.4%), mild MR, TR, PAH (1.4%).

Figure: 3 showing Echocardiography of patients with hypertensive emergencies

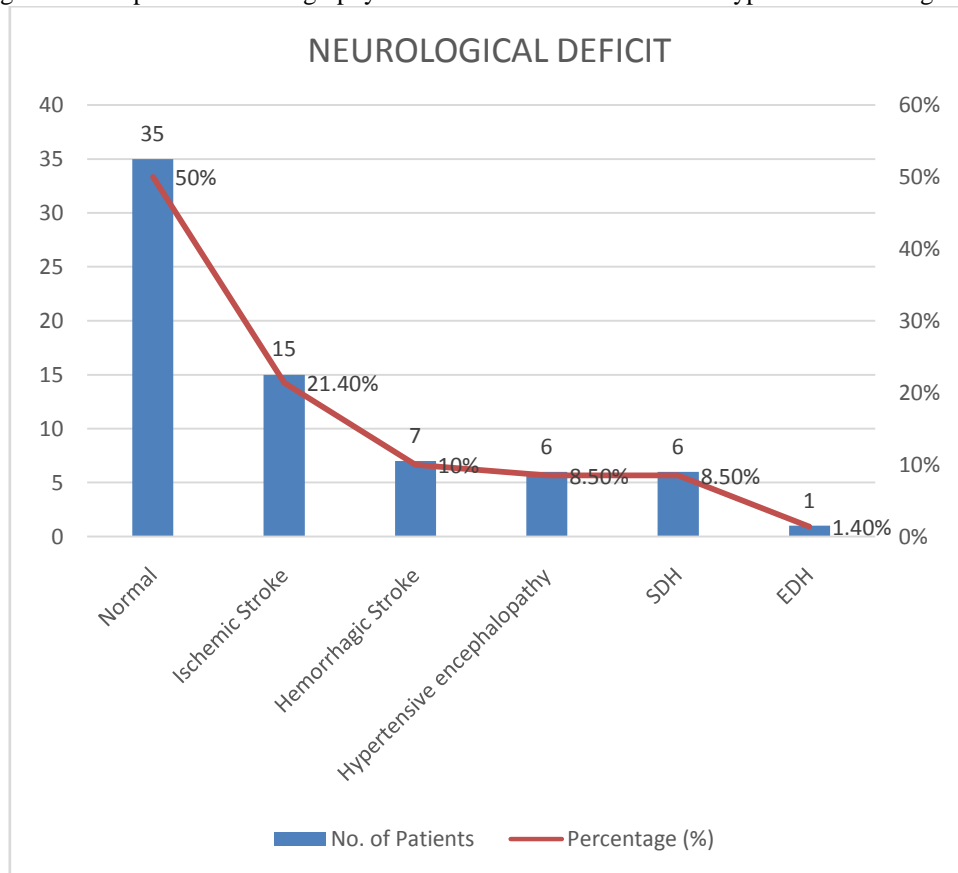


Out of 70 patients with hypertensive emergencies 50% of patients were having normal Computerized Tomography of Brain Plain followed by Ischemic stroke (21.4%), haemorrhagic stroke

(9.8%), Hypertensive encephalopathy and Sub Dural Hematoma were 8.5% each, Extra Dural Hematoma (1.4%). (Figure:4)



Figure: 4 Computerized Tomography of Brain Plain of Patients with Hypertensive Emergencies



According to table:4 72.9% patients were having normal respiratory component followed by 15.7% had crepitation's, 5.7% were on Mechanical

Ventilation Support, 4.3% were having wheeze, 1.4% were have tachypnea.

Table: 4 Showing Respiratory System Deficit in patients presenting to hypertensive emergencies.

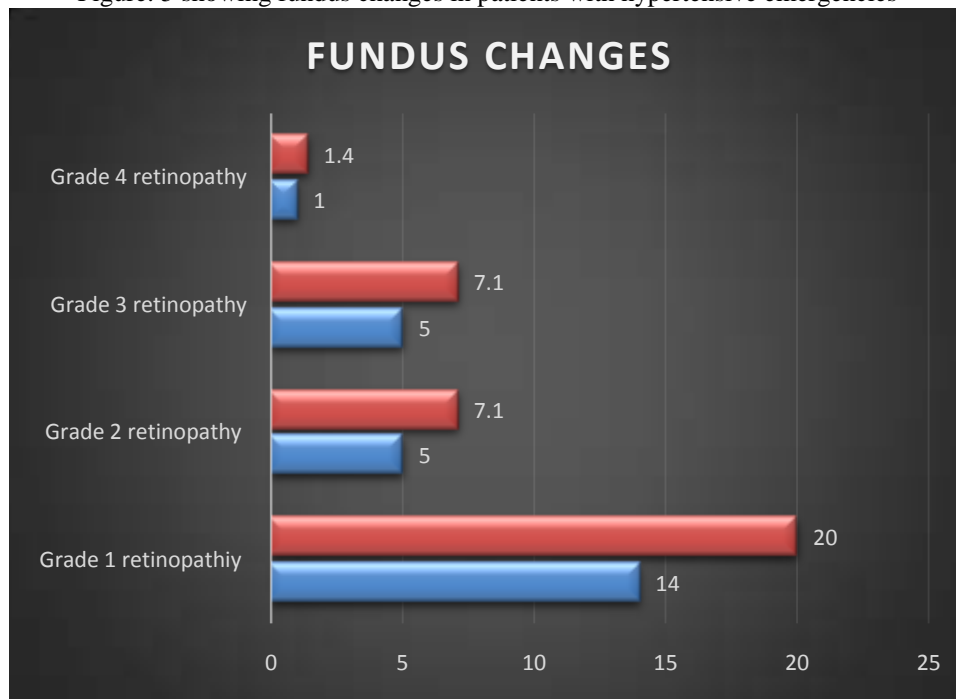
Sno	Respiratory component	Number	Percent %
1	Normal	51	72.9
2	Crepitations	11	15.7
3	M V Support	4	5.7
4	Wheeze	3	4.3
5	Tachypnea	1	1.4

Out of 70 patients with hypertensive emergencies 20% were having grade 1 retinopathy followed by 7.1 % each in grade 2 and grade 3

retinopathy followed by 2.8% were having grade 4 retinopathy. (figure:5)



Figure: 5 showing fundus changes in patients with hypertensive emergencies



V. DISCUSSION:

A Prospective observational study done at Sri Venkateshwara Institute of Medical Sciences, Tirupati. The Clinical manifestations of hypertensive emergency are directly related to the particular end-organ dysfunction that has occurred.

Prevalence

Out of 4128 patients screened 70 patients were diagnosed with Hypertensive Emergencies to between May 2023 to October 2023. The prevalence of hypertensive emergencies was 1.69 %.

In a study done by Dhadke et al. (2017), prevalence of hypertensive emergencies of 1.22% in ICU³. In a study done by Pacheco et al (2013), prevalence of hypertensive emergencies was reported to be 3.75%⁶. JF martini et al (2007) reported to be prevalence of 0.68% of hypertensive emergencies⁷.

In our study observational study age group of 56-65 years followed by 46-55 years followed by 66-75 years. Were as in a study done by Varun MS et al group belonged to age group of 50-59 years followed by 60-69 years⁸. According to study done by Sabina salkic et al, most of the subjects belonged to age group of 60-69 years⁹.

In our study the number of males presenting with hypertensive emergencies are more 74.3% males when compared to females 25.7%. In a study done by Varun MS et al the

number of males presenting with hypertensive emergencies are 64 % were as 55% were females⁸.

In our clinical study most common presenting complaint out of 70 patients most common symptom is dyspnoea (58.6%), Headache (44%), Giddiness (41.4%), Vomiting (40%), Visual Deficit (37.1%), Chest pain (31.4%), Loss of consciousness (27.1%), Altered sensorium (22.9%).

In a study done by Zampaglione et al (1996) where in chest pain (27%), dyspnoea (22%), and neurological deficit (21%) were the most frequent signs in hypertensive emergencies¹. In a study done by Katz et al (2009), STAT registry the most common presenting symptoms included shortness of breath (29%), chest pain (26%), headache (23%), altered mental status (20%) and focal neurologic deficit (11%)¹⁰.

Target Organ Damage Retinopathy

Out of 70 patients hypertensive emergencies 14(20%) were having grade 1 retinopathy followed by 5(7.1 %) each in grade 2 and grade 3 retinopathy followed by 2 (2.8%) were having grade 4 retinopathy.

Dhadke et al. (2017) reported that 88% (44 out of 50 patients) with hypertensive retinopathy, 17 patients (34%) had grade II, 13 patients (26%) patients had grade I, while 10 patients(20%) had grade III, 4 patients (8%) of these patients had severe grade IV hypertensive retinopathy³.



Singh et al (1983) reported that in their study of 200 patients of hypertensive retinopathy. Grade II retinopathy was present in maximum number of cases (50%) followed by Grade I(24%), Grade III (15%) and Grade IV (11%)¹¹.

Cardiovascular system Involvement:

Out of 70 patients presented with hypertensive emergencies 65.4% were having normal ECG followed by 23.8% were having ST-T changes, LVH Pattern (2.8%) followed by, Poor R progression, premature ventricular contraction, sinus bradycardia, sinus tachycardia, absent q wave in v1-v5&v6 were 1.4% each. 34.5 % of cardiovascular involvement in our study.

In a study done by Dhadke et al. (2017) 11 patients (22%) had only left ventricular hypertrophy, 13 patients (26%) had LVH with ischemic heart disease (IHD), 8 patients (16%) of the patients presented in acute LVF, 5 patients (10%) came with acute myocardial infarction (AMI)³ Hence 64% of the patients presented with cardiovascular involvement.

Martin et al (2010) reported 30% patients presenting with acute LVF and 25% patients with acute myocardial infarction, with nearly 59.1% of the patients having cardiovascular involvement¹². Katz et al in the STAT Registry (2009) reported 26% of patients with cardiovascular involvement¹⁰.

Central Nervous System Involvement

Out of 70 patients with hypertensive emergencies 50% of patients were having normal Computerized Tomography of Brain Plain followed by Ischemic stroke (21.4%), haemorrhagic stroke (9.8%), Hypertensive encephalopathy and Sub Dural Hematoma were 8.5% each, Extra Dural Hematoma (1.4%).

In the study done by Dhadke et al. (2017) 16 (32%) of the patients with hypertensive emergencies. 2 patients came with transient ischemic attack (4%), 7 patients (14%) came with cerebral infarction, 5 patients (10%) presented with intracerebral bleed, 2 patients (4%) came with hypertensive encephalopathy. 34 patients (68%) had no evidence of CNS involvement. Martin et al (2010) reported 22.9 % of patients with hypertensive emergencies as having ischemic stroke, and 14.8% with intracerebral bleed with a total of 40.5% having some sort of neurological involvement¹². Katz et al (2009) in the STAT Registry reported 2.5% of patients as having Transient Ischemic Attack, 10% of patients as having ischemic stroke, 2.4% having intracerebral bleed¹⁰.

VI. SUMMARY AND CONCLUSION

Out of a total 4128 admissions during the study period in the department of emergency medicine a total of 70 cases of hypertensive emergencies were studied. This resulted in a prevalence of 1.69% of hypertensive emergencies.

Most common organ involvement in patients was the central nervous system, retina, respiratory involvement and cardiovascular involvement. Ischemic stroke was the most common finding in central nervous system. Left ventricular hypertrophy was the most common finding in cardiovascular system. Pulmonary edema was the most common finding in Respiratory system. Grade I Retinopathy was the most common finding in Retina.

The present study concludes that majority of patients presenting with hypertensive emergencies were belonged to four to eight decades of age. Males have higher incidence of developing hypertensive emergencies when compared to females. Preventing end organ damage and lowering mortality and morbidity can be achieved by promptly diagnosing hypertensive situations and administering the proper medication.

Funding: No funding sources

Conflict of interest: None declared

Ethical Approval: The study was approved by the Institutional Ethics Committee.

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