

Review Article

Study of Neurological Complications of Hypertensive Emergencies in Intensive Care Unit

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Abstract: Aims And Objectives:To study proportion of population of hypertensive emergencies presenting with neurological complications in intensive care unit **Materials And Methods:** This present observational study has been conducted in Department of General Medicine, D.Y Patil Hospital, Nerul, Navi Mumbai.A written signed informed consent has been taken prior to enrolling the subjects in the study. **Study Design:** Prospective observational study **Study Site:** Emergency, ICU, Department of General Medicine, D.Y Patil Hospital, Nerul, NaviMumbai **Duration Of Study:** September 2018 – December 2019 **Sample Size:** All consecutive number of patients presenting with hypertensive emergencies admitted in ICU, D.Y. Patil Hospital, Nerul, Navi Mumbai fitting the inclusion criteria during the entire duration of study).

Keywords: population of hypertensive emergencies.

SELECTION CRITERIA

Inclusion Criteria:

1. Patients aged 18 years or more
2. Systolic blood pressure >220 mmHg, Diastolic blood pressure >140 mm Hg.
3. Both groups of patients, those with past history of hypertension and those without past history of hypertension.

Exclusion Criteria:

- Pregnancy.

INTRODUCTION:

Hypertensive emergency is defined as severe hypertension more than 220/140 mm Hg with endorgan damage. A number of cardiovascular, pulmonary and neurological symptoms are found to be associated with patients in hypertensive emergency with target organ involvement. Focal neurological deficits, dyspnoea, chestpain, headache, loss of vision, are considered as the commonest symptoms of hypertensive emergencies. The primary aim is to reduce BP >25% within 2-6 Hrs stabilized to 160/100mmHg then 25% within 48 Hrs. All these conditions were diagnosed clinically and by diagnostic tests.

Biochemical Analysis:

Blood sugar, Electrolytes, Blood urea/creatinine; Urine routine and microscopy (for proteins/RBCS/puscells), Lipid profile.

Radiological Examination:

ChestXray, 2DECHO, USG
Abdomen/pelvis/renal Doppler, CT head
plain/contrastMRI brain.

CEREBROVASCULAR CONDITIONS

Hypertensive Encephalopathy:

Hypertensive encephalopathy is thought to be due to cerebral oedema resulting from a failure of cerebral blood flow autoregulation. When blood pressure increases progressively, at a mean arterial pressure of about 180 mmHg cerebral blood vessels lose their ability of auto regulation and unable to withstand high blood pressure. This causes the arteries to be stretched and dilated. This vasodilation allows a breakthrough of cerebral bloodflow which hyperperuses the brain under high pressure with leakage of fluids into the perivascular tissue leading to cerebral edema and clinical signs of hypertensive encephalopathy. Neurological examination might reveal a patient who is disoriented or with varying severity of

Quick Response Code



Journal homepage:

<http://www.easpublisher.com/easims/>

Article History

Received: 15.11.2019

Accepted: 26.11.2019

Published: 08.12.2019

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altered sensorium, presence of focal neurological signs, generalized or focal seizures, retinopathy including papilloedema, asymmetric reflexes and nystagmus. Chronically hypertensive patients usually tolerate raised blood pressure levels. Hypertensive encephalopathy is a diagnosis of exclusion. Goal of the therapy is to reduce the mean arterial pressure gradually by no more than 20-25% or to a diastolic BP of 100 mmhg, whichever value is higher during the first hour. 26 Most patient who present to the emergency department with increased blood pressure have chronic hypertension.

Athero-Thrombotic Brain Infarction with Severe Hypertension:

Study by martin *et al.*, reported that most cases of hypertensive emergencies corresponded to cerebrovascular lesions (58%) among which 67% were cases of ischaemic stroke. Study by Zampaglione *et al.*, found a lesser number of patients with ischaemic stroke (24.5%).

Intra-Cerebral Haemorrhage:

Intracerebral hemorrhage is more than twice as common as subarachnoid hemorrhage (SAH) and is much more likely to result in death or major disability than cerebral infarction or SAH Advancing age and hypertension are the most important risk factors for ICH 34, 35.

Subarachnoid Hemorrhage:

Patients with subarachnoid hemorrhage usually present with severe headache altered sensorium and neurological deficits.

RESULTS AND ANALYSIS:

Distribution of Cases by Neuro Imaging:

Of the 125 patients studied 40 patients (32%) had Infarction, 26 patients (20.8) had Intra Cranial bleed, 20 patients (20.8%) had normal study and for the rest 33 patients neuro imaging was not done.

Ct/Mri Brain	Frequency (N=125)	Percentage%
Normal	26	20.8
Infarction	40	32
Intra Cranial Bleed	26	20.8
Not Done	33	26.4

Distribution of Cases by Presenting Complaints:

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 25 patients (50 %) followed by dyspnoea in 17 (34 %) and chest pain in 15 patients (30%). Three (six percent) presented with convulsions and visual deficits each.

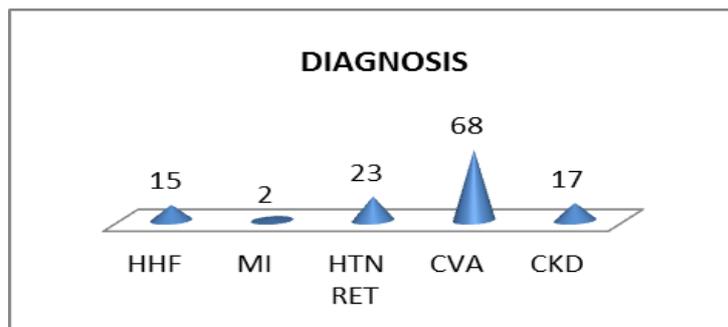
Presenting Complaints	Frequency(N=125)	Percentage %
Chest Pain	2	1.6
Dyspnea	29	23.2
Headache	11	8.8
Blurring Of Vision	13	10.4
Neurological Deficits	67	53.6
Sudden Loss Of Consciousness	1	0.8

Distribution of Cases by Diagnosis:

Out of 125 patients in this study, 28 patients (22.4%) had Intra cranial bleed, 40 patients (32%) had Infarct/TIA, 15 patients (12%) had Hypertensive heart

failure, 23 patients (18.4%) had Hypertensive retinopathy, 17 patients (13.6%) had Chronic kidney failure and 2 patients (1.6%) had Myocardial infarction.

Diagnosis	Frequency (N=125)	Percentage%
CVA	68	54.4
Hypertensive Retinopathy	23	18.4
CKD	17	13.6
Hypertensive Heart Failure	15	12
Myocardial Infarction	2	1.6



DISCUSSION:

Presenting Complaints:

Analyzing the presenting symptoms, the largest group of patients in the present study, presented with a neurological deficit (54.4%) followed by dyspnoea(23.2%),blurring vision(10.4%),headache(8.8%), chestpain(1.6%).This was similar to the study by Martin *et al.*, who in their study found presenting symptoms of neurological deficit.Zampglione *et al.*, in their study had more patients presenting with chest pain (27%) followed by dyspnoea (22 %) and neurological deficits(21%).In my study chestpain contributed only for 1.6%.In my study neurological deficits varied from hemiparesis (98.5%), altered sensorium (1.5%)..In my study we observed right sided hemiparesis is more common than left sided hemiparesis.In study by Cerrilo *et al.*, most common presentation is headache followed by chestpain, dizziness.

Computed Tomography/Magnetic Resonance Imaging of Brain:

In my study we observed computed tomography of the brain showed non-hemorrhagic Infarct(32%)as the commonest cause for the neurological deficit followed by intracerebral hemorrhage(20.8%).Normal computed tomography of brain/magnetic resonance imaging of brain is seen in 20.8% of patients. computed tomography of brain/magnetic resonance imaging of brain is not done in 26.4% of patients.In study by Zampglione *et al.*, computed tomography of brain showed non-hemorrhagic infarct (24%) as commonest cause for neurological deficit followed by intra-cerebral hemorrhage(4.5%).

Diagnosis:

Evaluation for target organ damage in patients in the my study showed CVA(Infarct, intra-cerebral haemorrhage and TIA)as the commonest cause (54.4%) followed by HypertensiveRetinopathy(18.4%),Chronic Kidney disease(13.6%),Hypertensive Heart failure(12%) and Myocardial Infarction(1.6%).Zampglione *et al.*, in their study observed target organ damage in the form of CVA(28.5%),left ventricular failure (23%)in their patients. Study by Martin *et al.*, shows CVA(56%),left ventricular failure (25 %), and acute myocardial

infarction in (8%) their patients.In study by Lanthier *et al.*, target organ damage of hypertensive heart failure(32%)followed by stroke(23%),acute coronary syndrome(21%) is seen.

CONCLUSION:

1. Majority of patients presenting in hypertensive emergency belonged to the fifth and sixth decades of age.
2. Males have higher chances of developing hypertensive emergencies compared to females.
3. Known hypertensives are at a higher risk of presenting with acute target organ damage associated with hypertensive emergency.
4. Presence of diabetes mellitus and dyslipidemia increases the chance of developing hypertensive emergencies
5. Commonest mode of presentation is with a neurological deficit.
6. Higher levels of blood pressure at presentation points towards a more adverse outcome.
7. Acute cerebrovascular accident(infarct,intracerebral bleed,transient ischemic attack) is the commonest form of target organ damage encountered in the present study
8. The in-hospital mortality among these patients with hypertensive emergency were 4%.
9. A larger study is needed to comment on the clinical profile of patients with hypertensive emergencies.

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