Study of Brain Imaging in Accelerated Hypertension

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ABSTRACT

BACKGROUND
Accelerated hypertension is defined as a rapid and inappropriate intense elevation of blood pressure with or without a risk of rapid damage to target organs such as the heart. It is a common presentation to the emergency department and appears without history of hypertensive diseases in 23% of cases. The present study was conducted to study the brain imaging in cases admitted with accelerated hypertension to find the incidences of brain parenchymal insult in case of accelerated hypertension in a tertiary healthcare institute.

METHODS
The observational study was done among patients presenting with hypertensive emergencies admitted under the Department of Medicine, KIMS, Karad, from August 2018 to December 2018. On admission, detailed history was taken, and complete clinical examination was done. It was an observational study.

RESULTS
Majority of the cases had a haemorrhagic stroke (16.66%), followed by 4.16% cases of transient ischaemic attacks and 4.16% cases of ischaemic stroke.

CONCLUSIONS
Acute intracerebral haemorrhage was the most common form of end organ damage in present study. The hospital mortality among the patients with hypertensive emergencies were 18.75%.

KEYWORDS
Accelerated Hypertension, Hypertensive Crisis, Brain Imaging, Blood Pressure

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**BACKGROUND**

Accelerated hypertension is a rapid and excessive high blood pressure elevation with or without a risk of rapid harm to target organs such as the heart.[1][2] It is a typical presentation to the emergency department and occurs in 23 percent of patients without history of hypertensive disease.[3]

Among the patients with elevated blood pressure, hypertensive encephalopathy is a neurological condition. It is marked by fast-growing signs and symptoms including nausea, hallucinations, visual disturbances, impaired mental status, and focal neural indications. Although the condition is typically manageable if the hypertension is treated early, if it is not detected and the medication is postponed, it may be lethal. The medical results are not clear enough to make the diagnosis complicated.[4]

Volhard and F Fähr[7] first addressed hypertensive emergency syndrome in 1914 and was characterized by extreme, acute hypertension, along with symptoms of renal disease and symptoms of chest, head, retina and kidney dysfunction, with increasingly fatal heart attack, renal insufficiency and stroke. The epidemiology of hypertensive crises parallels the distribution of essential hypertension in the community, being much higher among African-Americans and the elderly; however, men are affected two times more frequently than are women.[8] In 1939, before extensive use of anti-hypertensive agents, the first comprehensive review in natural history with malignant high blood pressure was reported.[9][10] Untreated malignant hypertension was 79 percent one-year mortality and average survival of 10.5 months in this landmark study by Keith and his colleagues.[11]

While HC is uncommon in a clinical trial setting, certain drug interaction research studies, including tyramine in conjunction with monoamine oxidase inhibitors, may cause HC. In addition to the activation of the renin-angiotensin vasopressors system, endothelial and catecholamine are postulated to take important roles in the pathophysiology of the hypertensive emergencies, a quick upward blood pressure in patients with a range of BP from 180/100 to 110 mmHg or a sudden increase in systolic BP above baseline of over 60 mmHg.[12]

**Clinical Manifestations of Hypertensive Crises**

Hypertensive crisis manifestations clinically involve end-organ dysfunction. Organ dysfunction (excluding in children and during the pregnancy) is uncommon when diastolic pressure is lower than 130 mmHg. However, the absolute blood pressure level may not be as significant as the increase rate. A systolic blood pressure of 200 mmHg or up to 150 mmHg diastolic pressure can be tolerated without development of hypertensive encephalopathy, in patients whose blood pressure has been long lasting, whereas children or pregnant women can develop encephalopathy with a blood pressure of 100 mmHg diastolically.[13][14] Signs and symptoms are different from patient to patient with hypertensive crises. Patients of high-tension encephalopathy exhibit nausea, impaired level of consciousness and/or specific neurological symptoms. These patients may have arteriolar changes, blood cells, exudates, and a papilledema during physical exams.[15] They are retinal. Other patients with angina, acute myocardial infarction or acute ventricular failure may experience a cardiovascular manifestation of high blood pressure. In some patients, acute renal failure with oliguria and/or haematuria could lead to serious renal injury.[8]

Acute blood pressure ranges from a mild disease to a life-threatening process in pregnant patients. The clinical characteristics may vary with severe headaches, severe headaches, anorexia, mood disturbances, acute strokes, severe upper right-hand abdominal pain, congestive heart failure or oliguria. This can only be inferred by execution in the vast majority of cases. The decision to continue to deliver after consulting medical and obstetric practitioners should be made.[16]

A major changeable risk factor for stroke is that of hypertension, with an estimated 51 percent of stroke deaths attributable globally to high systolic blood pressure. Timing, type of stroke, thrombolytic use, medically competitive conditions and pharmacological variables determine the management of stroke hypertension.

**METHODS**

The observational study was done among patients presented with hypertensive emergencies admitted under department of medicine, KIMS, Karad, from August 2018 to December 2018 on admission, detailed history was taken, and complete clinical examination was done. It was an observational study. The Present study was conducted after obtaining approval from institutional ethical committee. All the cases were enrolled in this study after taking their due consent.

**Inclusion Criteria**

1. 180 mmHg systolic blood pressure and above or above 120 mmHg diastolic blood pressure.
2. Evidence of injury whether clinically or in the laboratory.

**Criteria for Exclusion**

1. People below 18 years of age or older than 40 years of age
2. Hypertension caused by breastfeeding in patients with valvular heart disease.

**Diagnostic Criteria**

Hypertensive emergency treatment will be established. We obtained written informed consent in all cases to participate in the study.

**Data Collection Procedure**

This experiment included all patients who met the requirements for inclusion or omission. The permission was received from the clinicians and attendants included in the study to carry out the examinations and interventions required. A Proforma was prepared that included detailed history, medical review and appropriate research available at our hospital. A thorough diagnostic evaluation were undertaken, recognizing neurological deficiencies. For all cases, specific examinations such as haemoglobin, total white cell count, erythrocyte sedimentation level, daily urinalysis, blood glucose, blood urea, serum creatinine, serum electrolyte, serum lipid profile, chest X-ray, CT scan head,
electrocardiography, fundoscopy, urinary albumin was conducted. The results were analysed to assess the aetiology, risk factors, and the pattern of clinical and radiological profile. A proper questionnaire was used to collect data from all the cases, and which was recorded in the form of tables and graphs. The data were analyzed using SPSS program version 21 software. The data was summarized and tabulated accordingly.

RESULTS

In this study, we found that the majority of cases with elevated hypertension were male (56.25%), followed by 43.75% females. We found that most instances of elevated hypertension belonged to the age group of 56-65 years, (29, 16%), accompanied by 46-55% (26, 16%) and 66-75% (16, 66%). The study participants had a median age of 57.41±14.12 years.

Our analysis of their high blood pressure and diabetic diagnosis shows that most of the instances of hypertension (67.70%) are identified and 12.5% were known for their diabetes mellitus and 4.16% for ischaemic heart disease. In the present study, they observed that most of the participants in the trials submitted headaches (81.25%), accompanied by giddiness of 37.5%, 35.42% of those with headaches, 19.79% of cases of dyspnoea, limb fatigue in 15.62%, and oedema in 10.41% of the instances.

At briefing, they measured the systolic and diastolic blood pressure of all the study subjects. They observed that on admission the average systolic blood pressure was 183±24.7 mm Hg while on admission the average diastolic blood pressure was 99,68±18,03 mmHg.

We have encountered alleged brain imaging injuries (CT / MRI Brain). They observed that most patients had a haemorrhagic stroke (16.66%), accompanied by 4.16% of intermittent ischaemic attacks and 4.16% with an ischaemic stroke.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number of Cases</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Males</td>
<td>54</td>
<td>56.25%</td>
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<tr>
<td>Females</td>
<td>42</td>
<td>43.75%</td>
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<tr>
<td>Total</td>
<td>96</td>
<td>100%</td>
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<th>Number of Cases</th>
<th>Percentage</th>
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<td>&lt;25 years</td>
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<td>1.04%</td>
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<tr>
<td>26-45</td>
<td>7</td>
<td>7.29%</td>
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<tr>
<td>36-45</td>
<td>12</td>
<td>12.5%</td>
</tr>
<tr>
<td>46-55</td>
<td>25</td>
<td>26.84%</td>
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<tr>
<td>56-65</td>
<td>28</td>
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<td>&gt;76 years</td>
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<td>7.29%</td>
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<tr>
<td>Total</td>
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<td>100%</td>
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<table>
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<th>Blood Pressure</th>
<th>Mean</th>
<th>Standard Deviation</th>
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<tr>
<td>Mean SBP</td>
<td>183</td>
<td>24.7</td>
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<td>Mean DBP</td>
<td>99.68</td>
<td>18.03</td>
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<tr>
<th>Clinical Presentation</th>
<th>Number of Cases</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Headache</td>
<td>78</td>
<td>81.25%</td>
</tr>
<tr>
<td>Giddiness</td>
<td>36</td>
<td>37.5%</td>
</tr>
<tr>
<td>Chest pain</td>
<td>34</td>
<td>35.42%</td>
</tr>
</tbody>
</table>

DISCUSSION

In the present study, we observed that majority of the cases presented with accelerated hypertension were males (56.25%), followed by 43.75% female cases.

Hypertensive heart crises in the new clinical trial of tertiary healthcare. The number of men with high blood pressure is lower than that of females. 66 percent of these cases are persons. Some of them were Martin.[17] In their hypertensive disaster study, 55% of people in hypertensive emergencies are male was the potentially strongest in groups aged 56-65 years (29.16%), accompanied by age 46-55 years (26.16%) and 66-75 years (16.66%). This has been followed by 46-55%. The average age for these subjects was 57.41±14.12.

Hypertensive conditions and diabetic status have been assessed, we have observed that most of the cases were known for high blood pressure (67.70%), 12.5% for diabetes, and 4.16% for ischemic heart disease.

Garcia GM also noted that many (65.9%) of the clinicians have already been treated with hypertension in their research. Increasingly, Zampaglione et al.[16] notes that (92 percent) of their clinicians have experienced hypertensives. The study conducted by Martin et al. showed 26 percent of patients with diabetes mellitus.[17]

In this study, we found that most of the studied subjects had headache as their complaint (81.25 per cent) followed by 37.5 per cent giddiness, 35,42 per cent chest pain, 19.79 per cent dyspnoea, 15,62 per cent limb weakness and oedema among 10,41 per cent cases.

Martin et al[17] observed throughout their research that 48 per cent, 25 percent, and 18 per cent for their patients had symptoms of cognitive defects, dyspnoea, and chest pain. Zampaglione et al.[14] Numerous patients recorded chest pain (27%) or neurological problems (22%) in their report of dyspnoea. The present study evaluated the systemic and diastolic blood pressures of all the study subjects, including hemiparesis (75%), autism (16.6%) and W. We found that on admission the average systolic blood pressure was
Hypertensive emergencies are most commonly seen in 45-65 years age group. The threat of acute organ damage due to high blood pressure is lower in the recorded hypertensives. The most common form of diagnosis is cognitive dysfunction. Intracerebral haemorrhage is the most severe hypertensive emergency.

REFERENCES


