

Clinical Study of Hypertensive Crisis in Medicine Ward

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ABSTRACT

Introduction: A majority of hypertensive crisis cases are consequent of inadequate medical treatment. Hypertensive crisis is an urgent situation in the emergency department and presents various clinical patterns. The present study aimed to evaluate the risk factors and spectrum of end organ damage in hypertensive crisis.

Material and Methods: This study was carried out among 200 patients with SBP ≥ 180 mm Hg or DBP ≥ 120 mm Hg admitted to medicine ward. On admission detailed history, complete clinical examination, and necessary investigations were done to assess the end organ damage. Among 200 patients of hypertensive crisis (HTN-C), 144 individuals (72%) met the criteria for hypertensive emergency (HTN-E) and 56 (28%) met the criteria for hypertensive urgency (HTN-U).

Results: Patients with HTN-E were older ($P < 0.001$), more sedentary ($P = 0.037$), more smoker ($p = 0.0073$) and more non adherent to anti hypertensive medications ($p = 0.049$) than those with HTN-U. Furthermore, fewer HTN-E patients than HTN-U patients had known history of hypertension ($P = 0.0029$). Retinopathy (66%), ischemic stroke (23%), hemorrhagic stroke (16%), acute heart failure (18%) and acute coronary syndrome (16%) were target-organ damage in HTN-E. The prevalence of hypertensive crisis in the patients admitted to the ICU is approximately 1.76%.

Conclusion: The early detection of end organ damage and appropriate treatment are key determinants to avoid severe complications of hypertension.

Keywords: Hypertensive Crisis, Hypertensive Emergency, Hypertensive Urgency

INTRODUCTION

The prevalence of hypertension is increased in India, from 5% to more than 30% from 1960s to 2008.¹ It is approximated that around 1% of patients with hypertension develop a hypertensive crisis during their lifetime.² A majority of hypertensive crisis cases are consequent of inadequate medical treatment.³ Even though chronic hypertension is established recognised risk factor for cardiovascular, cerebrovascular and renal disease, acute elevations in blood pressure can lead to significant morbidity due to acute end organ damage.⁴

A hypertensive crisis is further classified into hypertensive emergency (HTN-E) and hypertensive urgency (HTN-U). HTN-E is characterized by a severe elevation of blood pressure (BP; $\geq 180/120$ mm Hg) that represents an acute threat to vital organs leading to organ damage or target organ failure and it should be monitored carefully under intensive care unit settings to reduce blood pressure within one hour using parenteral drugs.⁵ HTN-U is characterized by uncontrolled blood pressure without failure or damage to

the target organ,⁶ and it should be controlled with oral drugs within 24 hours.⁵

Providentially, now therapeutic options include the time-tested medications available for both the acute, in-hospital treatment of hypertensive emergencies, as well as outpatient management of chronic hypertension. If properly treated, hypertensive emergencies need not to be considered as malignant no longer.⁷

Hypertensive crisis is an urgent situation in the emergency department and presents various clinical patterns. Hence, present study was an attempt to create awareness regarding various risk factors leading to hypertensive crisis along with their timely prevention and subsequently reducing mortality and morbidity associated with it.

MATERIAL AND METHODS

A total of 200 patients presenting hypertensive crisis (HTN-C) and admitted to the Medicine Department from March 2015 to May 2016 were evaluated in this study. The criteria proposed by the Seventh Joint National Committee were used for the definition of HTN-C. We classified as HTN-C into hypertensive emergencies (HTN-E) and hypertensive urgencies (HTN-U) depending on target organ damage. Hypertensive emergency in which elevated blood pressure was related with one or more of the following types of acute or ongoing target organ damage (TOD): stroke (cerebral infarction or hemorrhage); hypertensive encephalopathy; subarachnoid hemorrhage; acute pulmonary edema, acute myocardial infarction; transient ischemic attack; acute heart failure; progressive renal insufficiency as well as features suggestive of retinopathy. Hypertensive urgencies (HTN-U) are those situations associated with severe elevations in BP without progressive TOD.

Detailed history was taken and clinical examination was commenced at the time of admission and all these conditions were diagnosed clinically and by diagnostic tests as appropriate (blood and urine chemistry, lipid profile, fundus examination, ECG, chest X ray PA view). Troponin was performed when acute coronary syndrome was suspected, and computed tomography was done when brain damage

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suspected, for example, during the suspicion of stroke and hypertensive encephalopathy.

The study excluded female patients presenting with preeclampsia and eclampsia, patients with valvular heart disease and patients <18 years of age. BP was measured by the standard technique in lying down as well as in standing position and average of three BP measurements obtained with a mercury sphygmomanometer. Obesity was recognized by BMI and Waist Circumference.

STATISTICAL ANALYSIS

The obtained quantitative results were expressed as mean \pm standard deviation, while qualitative variables were expressed as numbers and percentages. Comparisons between patient's characteristics were done by unpaired t-test for quantitative variables and chi square test was used for qualitative variables.

RESULTS

Table 1 shows clinical and epidemiological profile of patients admitted with HTN-C, HTN-E and HTN-U. Among 200 patients HTN-C, 144 individuals (72%) were enrolled in the study according to the criteria for HTN-E and 56 (28%) were enrolled in the study according to the criteria for HTN-U.

Patients with HTN-E were older ($P<0.001$), more sedentary ($P=0.037$), more smoker ($p=0.0073$) and more non adherent to anti hypertensive medications ($p=0.049$) than those with HTN-U. Furthermore, fewer HTN-E patients than HTN-U patients had known history of hypertension ($P=0.0029$). There was no difference found amongs groups regarding BP levels, gender, obesity, and alcohol, known history of diabetes and family history of hypertension.

Common presenting complaint in the study group (table 2) as whole was neurological deficit which was revealed in 68 patients (34%) followed by dyspnea in 62 patients (31%), headache in 52 patients (26%), chest pain in 42 patients (21%) and other symptoms included giddiness, epistaxis, palpitation, vomiting, decreased urine output and psychomotor agitation. In HTN-E study group most common presentation was neurological deficit (47.22%) followed by dyspnea (37.5%) and chest pain (25%). Meanwhile, in the group with HTN-U patients, the most patients reported headache (44.64%) as common presentation followed by giddiness (42.86%), and epistaxis (37.5%).

Table 3 shows target organ damage in hypertensive crisis patients. Among 200 patients of HTN-C, retinopathy was found in 132 patients (66%) while, 82 patients (41%) had central nervous system involvement, with 38 patients (19%)

Variable	HTN-C (n=200)	HTN-E (n=144)	HTN-U (n=56)	P value
Age	61 \pm 11	63 \pm 10	52 \pm 9	<0.0001
Male (%)	56	58.33	50	>0.05
Sedentarism (%)	64	68.75	51.78	0.0375
Obese (%)	64	67.36	55.53	>0.05
Dyslipidemic (%)	42	44.45	35.41	>0.05
Alcoholics (%)	44	47.22	35.41	>0.05
Smokers (%)	38	43.06	25	0.0073
Known hypertensives (%)	78	72.44	92.86	0.0029
Non compliance (%)	27	40.38 (n=104)	23.08 (n=52)	0.09
Known diabetics (%)	26	27.08	23.2	>0.05
Family history (%)	28	31.95	17.86	>0.05
SBP	203 \pm 14	202 \pm 13	201 \pm 16	>0.05
DBP	130 \pm 6	130 \pm 7	131 \pm 5	>0.05

Significance was determined by χ^2 test for comparison of urgencies vs emergencies

Table-1: Clinical and epidemiological profile of patients admitted with HTN-C, HTN-E and HTN-U

Sign and symptoms	HTN-C n=200	HTN-E n=144	HTN-U n=56	P value
Neurological motor deficit (%)	34%	47.22%	0%	<0.0001
Dyspnea (%)	31%	37.5%	14.42%	0.026
Headache (%)	26%	18.75%	44.64%	0.0004
Chest pain (%)	21%	25%	10.71%	0.042
Giddiness (%)	19%	9.72%	42.86%	<0.0001
Epistaxis (%)	12%	2.1%	37.5%	<0.0001
Vomiting (%)	11%	4.2%	28.57%	<0.0001
Palpitation (%)	10%	6.25%	19.65%	0.01
Decreased urine output (%)	8%	11.11%	0%	0.021
Psychomotor agitation (%)	8%	5.56%	7.14%	>0.05
Other (%)	8%	11.11%	0%	<0.0001
Asymptomatic (%)	4%	0%	14.28%	<0.0001

Significance was determined by χ^2 test for comparison of urgencies and emergencies.

Table-2: Frequency of Signs and symptoms of patients with HTN-C, HTN-E and HTN-U

Target Organ Damage Type	No. of Cases (%) (n=200)
Retinopathy	66
Cerebral infarction	19
Intracerebral hemorrhage	16
Acute heart failure	18
Acute coronary syndrome	16
Transient ischemic attack	4
Subarachnoid hemorrhage	1
Hypertensive encephalopathy	1

Table-3: Target Organ Damage in Hypertensive Crisis

of cerebral infarction, 32 patients (16%) of intracerebral hemorrhage, 8 patients (4%) of transient ischemic attack and 2 patients (1%) of subarachnoid hemorrhage and hypertensive encephalopathy each. Among cardiac involvement, 36 patients (18%) had acute heart failure and 32 patients (16%) had acute coronary syndrome.

DISCUSSION

Hypertension is present in approximately one billion of the world population and is responsible for an average of 7.1 million deaths annually.⁸ The present study was carried out among 200 patients of hypertensive crisis who were admitted to the ICU. These patients were studied out of a total of 11,375 ICU admissions over a period of one year. Hence, the recorded prevalence was 1.76%.

The high prevalence rate of hypertensive crises was found by Zampaglione et al⁹ who revealed that blood pressure was unknown at presentation in 8% of hypertensive emergencies and 28% of hypertensive urgencies. However, above mentioned studies may result from the inclusion of cases of hypertensive pseudocrisis, which may imitate hypertensive urgency and consequently, distort the final results. This fact was observed by Nobre et al¹⁰ who reported that 64.5% of the hypertensive patients, characterized as having hypertensive pseudocrisis, were inappropriately treated in the emergency unit as having a hypertensive crisis.

Out of 200 patients of hypertensive crisis, 144 (72%) were hypertensive emergencies and 56 (28%) were hypertensive urgencies. While other investigators found a greater prevalence of hypertensive urgencies.¹¹⁻¹⁷

In the present study, mean age for HTN-E was (63±10) and mean age for HTN-U was (52±9) ($p<0.001$). Patients with HE were older ($P<0.001$), more sedentary ($P=0.037$), more smoker ($p=0.0073$) and more non adherent to anti hypertensive medications ($p=0.049$) than those with HU. Furthermore, fewer HE patients than HU patients had known history of hypertension ($P=0.0029$). The groups did not differ regarding BP levels, gender, obesity, and alcohol, known history of diabetes and family history of hypertension.

Rodriguez et al¹⁸ reported that 12.6% of patients aware of their hypertension were not taking any medication. Tisdale et al¹⁹ reported that poor outpatient control of blood pressure was an independent predictor of subsequent hypertensive crisis. Katz et al²⁰ reported that 26% of patients who presented with hypertensive emergencies had either chronic or current

medication non adherence. In the prospective study by Saguner et al,²¹ non adherence was the most important factor associated with hypertensive crisis.

The signs and symptoms presented on admission to the hospital vary according to the clinical presentation of hypertensive crisis, depending on which target organs are affected most severely. In our sample, because of the higher frequency of strokes, acute heart failure and acute coronary syndromes, the most common signs/symptoms were neurological deficit, dyspnea, headaches and chest pain. Our findings varies with other studies due to higher frequency of strokes.^{11-17,22}

CONCLUSION

The present study concludes that as patients with HTN-E and HTN-U differ in their mode of presentation, it may helpful for classifying HTN-C into HTN-E and HTN-U during emergency management. As patients with HTN-E were more non adherent (40%), assuring adherence to antihypertensive therapy is one of most important aspect in management of hypertensive crisis during long-term follow-up.

The early detection of multiple target organ damage and appropriate treatment are key determinants for reducing morbidity and mortality among patients of hypertensive crisis.

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