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STUDY OF CLINICAL PROFILE OF PATIENTS WITH HYPERTENSIVE CRISIS

Medicine

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ABSTRACT

Hypertension is one of the most common chronic medical conditions in the India. The prevalence of hypertension is increased in India; it is approximated that around 1% of patients with hypertension develop a hypertensive crisis during their lifetime. A hypertensive crisis is further classified into hypertensive emergency (HTN-E) and hypertensive urgency (HTN-U). HTN-E is characterized by elevation of blood pressure (BP; ≥180/120 mm Hg) that represents an acute threat to vital organs leading to organ damage or target organ failure. HTN-U is characterized by an uncontrolled blood pressure without failure or damage to the target organ, and it should be controlled with oral drugs. Hence, present study was an attempt to create awareness regarding various clinical risk factors leading to hypertensive crisis along with their timely prevention and subsequently reducing mortality and morbidity associated with it

KEYWORDS

Summary

Hypertensive crisis is a global health concern which requires systematic and urgent attention. It may be helpful to classify patients of HTN-C into HTN-E and HTN-U during emergency management. The study helps to outline a better clinical approach in dealing with hypertensive crisis. Hypertensive crisis is a significant clinical entity having considerable mortality and morbidity, with persistent target organ damage in many patients, which significantly hampers their quality of life. This study guides us to investigate and comprehend the clinical profile of underlying mechanisms of hypertensive crisis.

AIMS AND OBJECTIVES

AIM

- Study of clinical profile of patients with hypertensive crisis.

OBJECTIVES

- To study the different clinical presentations of patients with hypertensive crisis.
- To analyze the risk factors for hypertensive crisis.
- To study the spectrum of end organ damage and outcome of patients presenting with hypertensive crisis.

MATERIALS & METHODS

Patients admitted with hypertensive crisis at Sir Takhatsinhji General Hospital, Bhavnagar were studied from August 2017 to July 2018.

Sample Size: 200 cases
Sample procedure: Cross-sectional study
Duration: August 2017 to July 2018

Inclusion criteria

- Patients giving informed consent.
- Patients above the age of 18 years.
- Systolic blood pressure of 180mmhg or more and/or diastolic blood pressure of 120mmhg or more (≥ 180/120mmhg)
- Evidence of target organ damage, either clinically or on laboratory findings.

Exclusion criteria

- Patients less than 18 years.
- Chronic renal failure, valvular heart disease, other secondary causes of hypertension

Anthropometric measurements including weight, height, body mass index (BMI; kg/m2) (wherever possible), and waist circumference (using inelastic and flexible tape at the midpoint between the lower margin of the least palpable rib and top of the iliac crest nearest to 0.1 cm) were carried out at the time of presentation.

A detailed history was taken with which included presenting symptoms, hypertension related history with emphasis on drug compliance. The information thus obtained was recorded in the proforma. Blood pressure was recorded in these patients at the time of admission, after one hour, once every four hourly and twice a day after normalization till discharge.

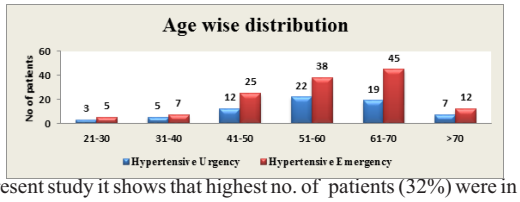
Detailed clinical examination was done in these patients with examination of cardiovascular system, respiratory system, abdomen and central nervous system. Clinical examination also included fundoscopic examination in all the patients. Blood samples of these patients were evaluated for biochemical abnormalities. The investigation done in these patients were the HB%, total count, differential count, blood sugar, serum urea, serum Creatinine, serum electrolytes, serum total cholesterol, serum triglycerides, HDL, LDL, microalbuminuria and urine analysis. All the patients also underwent chest x-ray, urine analysis and serum electrolytes. A 12 lead electrocardiogram of all patients was taken.

Patients with neurological deficits were evaluated with computed tomography/magnetic resonance imaging of the brain, patients with renal dysfunction underwent renal ultrasonography.

OBSERVATION AND RESULT

TABLE 1: AGE WISE DISTRIBUTION

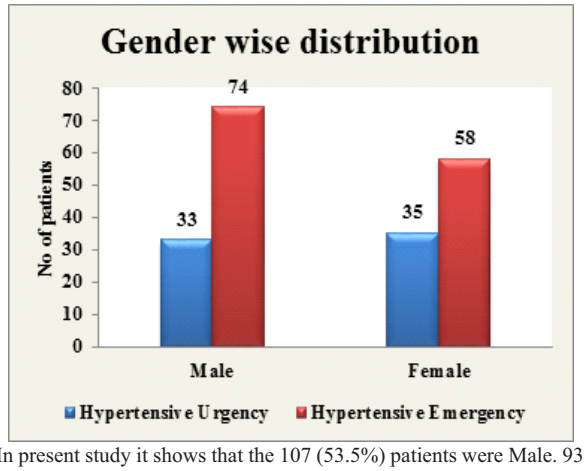
Age	Total patients (200)	Hypertensive Emergency(132)	Hypertensive Urgency (68)
21-30	8 (4%)	5(3.8%)	3 (4.4%)
31-40	12 (6%)	7(5.3%)	5 (7.3%)
41-50	37 (18.5%)	25(18.9%)	12 (17.6%)
51-60	60 (30%)	38(28.8%)	22 (32.3%)
61-70	64 (32%)	45(34.1%)	19 (27.9%)
>70	19 (9.5%)	12(9.1%)	7 (10.3%)
Mean Age	**55.81 ± 11.96**	**57.08 ± 11.97**	**53.33 ± 12.02**
p value	**0.0374**		



In present study it shows that highest no. of patients (32%) were in 61-70 age group and lowest (4%) in 21-30 age group. The youngest patient was 22 yrs and oldest was 76 yrs.

TABLE 2: GENDER WISE DISTRIBUTION

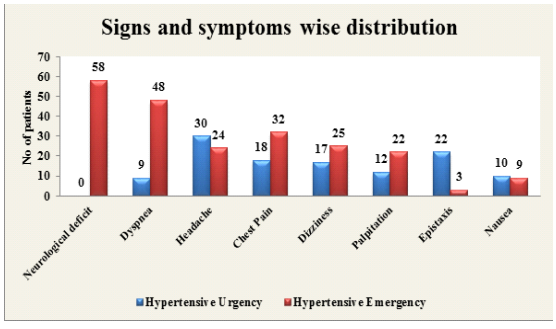
Sex	Total patients (200)	Hypertensive Emergency(132)	Hypertensive Urgency(68)
Male	107 (53.5%)	74 (56.1%)	33 (48.5%)
Female	93 (46.5%)	58 (43.9%)	35 (51.4%)
p value	0.0674		



In present study it shows that the 107 (53.5%) patients were Male. 93 (46.5%) patients were Female. Of the hypertensive urgencies, 48.5% occurred in men and 51.4% in women. Of the hypertensive emergencies, 56.1% occurred in men and 43.9% in women, and more than half of the patients with hypertensive urgency were female (51.4%).

TABLE 3: SIGNS AND SYMPTOMS

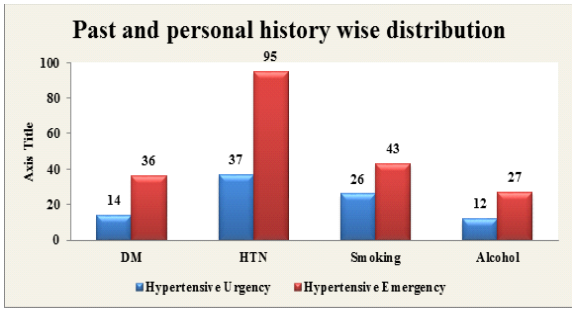
	Total patients (200)	Hypertensive Emergency (132)	Hypertensive Urgency (68)	p value
Neurological deficit	58 (29%)	58 (43.9%)	0	<0.0001
Dyspnea	57 (28.5%)	48 (36.3%)	9 (13.2%)	0.0011
Headache	54 (27%)	24 (18.1%)	30 (44.1%)	0.002
Chest Pain	50 (25%)	32 (24.2%)	18 (26.5%)	0.8632
Dizziness	42 (21%)	25 (18.9%)	17 (25%)	0.4159
Palpitation	34 (17%)	22 (16.6%)	12 (17.6%)	0.9810
Epistaxis	25 (12.5%)	3 (2.3%)	22 (32.3%)	<0.0001
Nausea	19 (9.5%)	9 (6.8%)	10 (14.7%)	0.1217



In present study common presenting complaint as neurological deficit was revealed in 58 patients (29%) followed by dyspnea in 57 patients (28.5%), headache in 54 patients (27%), chest pain in 50 patients (25%) and other symptoms included dizziness (21%), palpitation (17%), epistaxis (12.5%) and Nausea (9.5%). In HTN-E study group most common presentation was neurological deficit (43.9%) followed by dyspnea (36.3%) and chest pain (24.2%). In HTN-U patients, the most patients reported headache (44.1%) as common presentation followed by epistaxis (32.3%) and chest pain (26.5%).

TABLE 4: PAST AND PERSONAL HISTORY

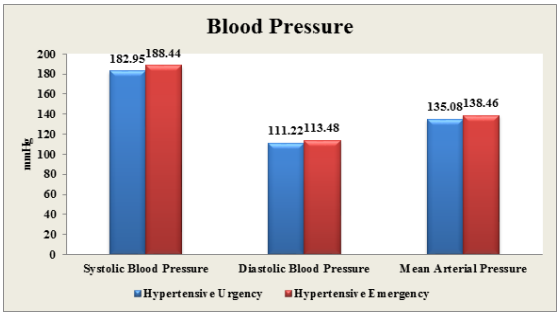
History	Total patients (200)	Hypertensive Emergency(132)	Hypertensive Urgency(68)	p value
DM	50(25%)	36(27.2%)	14(20.5%)	0.3888
HTN	122(61%)	95(71.9%)	37(54.4%)	0.0200
Smoking	69(34.5%)	43(32.5%)	26(38.2%)	0.5218
Alcohol	39(19.5%)	27(20.4%)	12(17.6%)	0.7746



The risk factors for hypertensive crisis were known as hypertension (61%), diabetes (25%), smoking (34.5%) and alcohol consumption (19.5%). Hypertension was a statistical significant risk factor for hypertensive crisis ($p<0.05$).

TABLE 5 : BLOOD PRESSURE

	Total patients (200)	Hypertensive Emergency(132)	Hypertensive Urgency (68)	p value
SBP	186.58 ± 14.58	188.44 ± 14.77	182.95 ± 13.58	**0.0113**
DBP	110.73 ± 4.60	113.48 ± 4.83	111.22 ± 4.10	**0.0012**
MAP	136 ± 6.98	138.46 ± 7.29	135.08 ± 6.28	**0.0014**



Above table shows that the overall Mean Arterial Blood Pressure is 135.08 ± 6.28 mm Hg in hypertensive urgency and 138.46 ± 7.29 mmHg in hypertensive emergency is statistically significant.

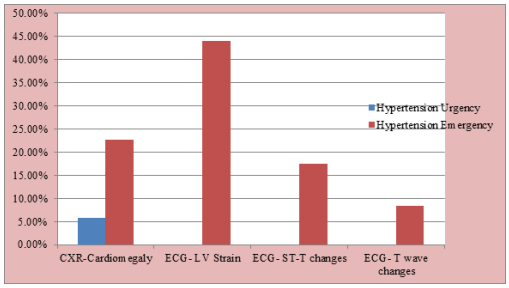
TABLE 6 : BIOCHEMICAL PARAMETERS

	Hypertensive Urgency (68)	Hypertensive Emergency (132)	p value
Hb	9.59 ± 1.61	9.43 ± 1.81	0.5397
Total Count	7231.28 ± 1592.15	7492.9 ± 1879.4	0.3280
APC	3.56 ± 1.08	3.59 ± 1.05	0.8499
FBS	98.57 ± 18.58	99.18 ± 20.89	0.8394
S. Urea	29.9 ± 5.94	29.87 ±7.25	0.9766
S. Creatinine	0.79 ± 0.3	0.82 ± 0.31	0.5130
Na	138.96 ± 3.44	139.5 ± 3.53	0.3026
K	4.39 ± 0.63	4.19 ± 0.63	0.0347
SGPT	21.93 ± 7.71	21.06 ± 6.78	0.4132
Calcium	9.42 ± 0.63	9.41 ± 0.58	0.9108
Uric Acid	5.39 ± 1.34	5.32 ± 1.31	0.7228
Cholesterol	192.29 ± 28.15	188.61 ± 31.19	0.4152
Triglyceride	140.07 ± 36.54	141.95 ± 38.66	0.7404
HDL	45.68 ± 12.9	47.44 ± 12.86	0.3608
LDL	112.53 ± 35.5	109.9 ± 34.79	0.6156

In the present study, it is demonstrated that biochemical parameters such Haemoglobin, Total Count, APC, Fasting Blood Sugar, S. Urea, S. Creatinine, Sodium, SGPT, Calcium, Uric Acid, Cholesterol, Triglyceride, HDL, LDL of HTN –E and HTN – U have no any statistically significant ($p>0.05$) where potassium level is significant.

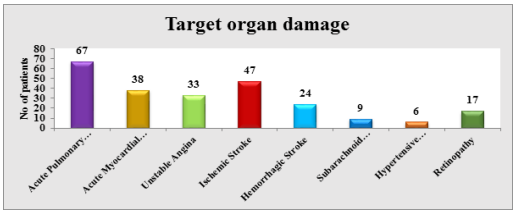
TABLE 7: ECG AND CXR WISE DISTRIBUTION

	Total patients (200)	Hypertensive Emergency (132)	Hypertensive Urgency (68)	p value
ECG				
LVH Strain	58 (29%)	58 (43.9%)	0	<0.0001
ST-T changes	23 (11.5%)	23 (17.4%)	0	0.0047
T wave change	11 (5.5%)	11 (8.3%)	0	0.0339
CXR				
Cardiomegaly	34 (17%)	30 (22.7%)	4 (5.8%)	0.0026



In the present study, it was found that greater proportion of patients in hypertensive emergency have left ventricular hypertrophy (LVH) and ST-T changes on ECG, as well as Cardiomegaly and features of pulmonary edema on chest radiogram.

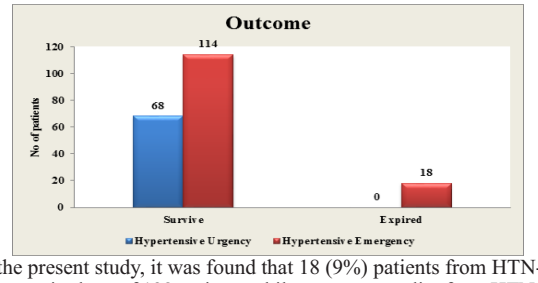
TABLE 8: TARGET ORGAN DAMAGE INVOLVEMENT



In the present study, it was reported that target organ damage in hypertensive emergency included cardiac 138 (69%), neurologic 86 (43%) and ophthalmic 17 (8.5%).

TABLE 9: OUTCOME

Age	Hypertensive Urgency (68)	Hypertensive Emergency(132)	Total patients (200)
Survive	68 (100%)	114 (86.3%)	182 (91%)
Expired	0	18 (13.6%)	18 (9%)
p value	0.0034		



In the present study, it was found that 18 (9%) patients from HTN- E were expired out of 132 patients while no any mortality from HTN- U group within 72 hours of admission.

DISCUSSION

TABLE 10: AGE WISE DISTRIBUTION

Study	Hypertensive Emergency	Hypertensive Urgency	P value
Present study	57.08 ± 11.97	53.33 ± 12.02	P<0.05
Manjhvar SK et al	52±9	63±10	p<0.05
Vilela-Martin JF et al	63.4 ± 13.4	57.0 ± 15.6	p<0.001

TABLE 11: GENDER WISE DISTRIBUTION

	Present study	Vilela-Martin JF et al	Salagre SB et al
Males with HE	56.1%	55.3%	67.2%

TABLE 12: SIGNS AND SYMPTOMS

	Present study	Martin et al	Zampaglione et al
Neurological deficit	43.9%	48%	21%
Dyspnea	36.3%	25%	22%
Chest pain	24.2%	18%	27%

TABLE 13: PAST AND PERSONAL HISTORY

	Present study	Martin et al
DM	25%	22.4%
HTN	61%	88.1%
Smoking	34.5%	50%

TABLE 14: PRESENTING BLOOD PRESSURE OF HYPERTENSIVE CRISIS

mmHg	Present study	Martin et al
Systolic blood pressure	186.6 +/- 14.5 mmHg	202.1 +/- 32.5 mmHg
Diastolic blood pressure	110.7 +/- 4.6 mmHg	130.5 +/-16.0 mmHg

TABLE 15: BIOCHEMICAL PARAMETERS: POTASSIUM LEVELS

Mean Potassium Values (meq/L)	Present study	Andrade DO et al
Hypertensive Urgency	4.3	4.4
Hypertensive Emergency	4.1	4.2

TABLE 16: CHEST X-RAY WISE DISTRIBUTION

Chest X-ray S/O Cardiomegaly	Present study	Rodriguez et al
Hypertensive Urgency	5.8%	9.7%
Hypertensive Emergency	22.7%	30.7%

TABLE 17: TARGET ORGAN DAMAGE INVOLVEMENT

Target organ damage in no. Of patients	
Acute Pulmonary Edema	67 (33.5%)
Acute Myocardial Infraction	38 (19%)
Unstable Angina	33 (16.5%)
Ischemic Stroke	47 (23.5%)
Hemorrhagic Stroke	24 (12%)
Subarachnoid Hemorrhage	9 (4.5%)
Hypertensive Encephalopathy	6 (3%)
Retinopathy	17 (8.5%)

TABLE 18: OUTCOME IN HYPERTENSIVE EMERGENCY

Outcome in HTN-E	Present study	Salagre SB et al	Gulhane S et al
Patients expired(%)	9%	15.8%	19.5%

SUMMARY

Of 200 patients studied, majority of the patients (66%) were having HTN emergency and 34% patients were having HTN urgency.Maximum patients (32%) were in 61-70 age group and minimum (4%) in 21-30 age group. The youngest patient was 22 yrs and oldest was 76 yrs.Of all patients with Hypertensive crisis in this study, male gender (53.5%) were having higher incidence as compared to females (46.5%). Of the HTN-U, women had higher occurrence (51.4%). Of the HTN-E, men had higher occurrence (56.1%). Patients with Hypertensive crisis were having past history of hypertension (61%), diabetes (25%), smoking (34.5%) and alcohol consumption (19.5%). In HTN-E study group most common presentation was neurological deficit (43.9%) followed by dyspnea (36.3%). Meanwhile, HTN-U patients have reported headache (44.1%) as common presentation followed by Epistaxis (32.3%). Potassium was most effectible reduced ion in HTN-E, was significantly lower than HTN-U. HTN-E accounts for greater proportion of left ventricular hypertrophy (LVH) (43.9%) and ST-T changes (17.4%) on ECG, as well as cardiomegaly (22.7%) and features of pulmonary edema on chest radiogram. Target Organ Damage included cardiac events (69%), Neurologic events (43%) and ophthalmic event (8.5%).

CONCLUSION

Hypertensive crisis is a global health concern which requires systematic and urgent attention. It may be helpful to classify patients of HTN-C into HTN-E and HTN-U during emergency management. The study helps to outline a better clinical approach in dealing with hypertensive crisis. This study helps in apprehending and better understanding of the causality for hypertensive crisis. Hypertensive crisis is a significant clinical entity having considerable mortality and morbidity, with persistent target organ damage in many patients, which significantly hampers their quality of life. This study guides us to investigate and comprehend the clinical profile of underlying mechanisms of hypertensive crisis. Appropriate measures of BP control should be pursued as a way to avoid complication of hypertension.

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