

**ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE
DEPARTMENT OF EMERGENCY MEDICINE AND CRITICAL CARE**



**RETROSPECTIVE STUDY OF CLINICAL PROFILE OF PATIENTS WITH HYPERTENSIVE
CRISES IN ADDIS ABABA UNIVERSITY TIKUR ANBESSA SPECIALIZED HOSPITAL**

BY

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LIST OF ABBREVIATIONS

AAU	Addis Ababa University
ACC	American college of cardiology
AHA	American heart Association
BP	Blood pressure
ED	Emergency Department
EM	Emergency Medicine
HU	Hypertensive Urgency
HE	Hypertensive Emergency
MI	Myocardial Infarction
NCD	Non communicable Disease
TASH	Tikur Anbessa Specialized Hospital
TOD	Target Organ damage

1 ABSTRACT

1.1 Background

Hypertension is an increasing public health problem in many developing countries including Ethiopia. The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure reported that chronic hypertension is affecting over one billion individuals world wide

If hypertension is not controlled, it may lead to hypertensive crises, consisting of hypertensive urgencies with no end organ damage or hypertensive emergencies with end organ damage.

The incidence of conditions such as strokes, myocardial infarction, left ventricular failure, aortic dissection, pulmonary edema or chronic kidney disease is correlated with the level of high BP.

The aim of this study is to assess the clinical profile of patients with hypertensive crises in TASH adult ED.(1)

Evidence and observational studies in Ethiopia estimated, the prevalence of hypertension is 20-30%. In Addis Ababa 2 population based studies conducted and showed prevalence of 30.3 & 25% respectively. Population based studies in northern part of Ethiopia also revealed a prevalence of 28.3 & 27.9%, while the prevalence is 7.7% in one institutional based study in Gonder.

2 Methodology

Retrospective Cross Sectional study was conducted from Jan 2019 to December 2019. The study period was Jan 2020- December 2020. subjects included are Adults 13 years and above presenting to Emergency department with hypertensive crises, Collected using structured questionnaires, to document Demographic information, clinical presentation and management outcome. Data was Cleaned, Edited, and analyzed using SPSS statistical software.

3 RESULT OF THE STUDY

Among a total of 626 patients who was screened for Hypertensive crises From Data registry, In the Emergency unit of Addis Ababa University TikurAnbessa Specialized Hospital In the Study period January 2019 to December 2019 , 212 patients met the criteria for hypertensive crises. Of these, 109 (51.41%) had Hypertensive urgency and 103(48.58%) had Hypertensive Emergency. Out of 103 hypertensive Emergency patients, 37.86% were discharged from ED, 29.1% ward Admission, 18.4% ICU admissions, 11.65% were ED Death, 2.9% were transferred out. And when compared to hypertensive urgency patients with hypertensive emergency are associated with poor outcome. Hypertensive Emergency had Significant association with predominant patients complain like Decreased urine output, chest pain, and Higher Diastolic Bp and patients clinical presentation like Extremity weakness ,Change in mentation ($p < 0.01$). since this study revealed that majority of patients with hypertensive crises present with complaint of headache, extremity weakness or other non specific complains, it is mandatory to take blood pressure and evaluate for possible hypertensive crises for patients presenting to ED with any complain.

Similar to most other studies, patients with hypertensive Emergency in this study are associated with poor outcome when compared to hypertensive urgency. so this study

recommend the importance of early detection, proper follow up to arrest further progression of patients with hypertension.

4 Dissemination of results

Federal Ministry of Health, Federal Ministry of Education, Addis Ababa University and other responsible stakeholders and policy makers will be communicated about the results and recommendations of this research. Results will be disseminated throughout the scientific community after publication.

CHAPTER 1

1 INTRODUCTION

1.1 Background

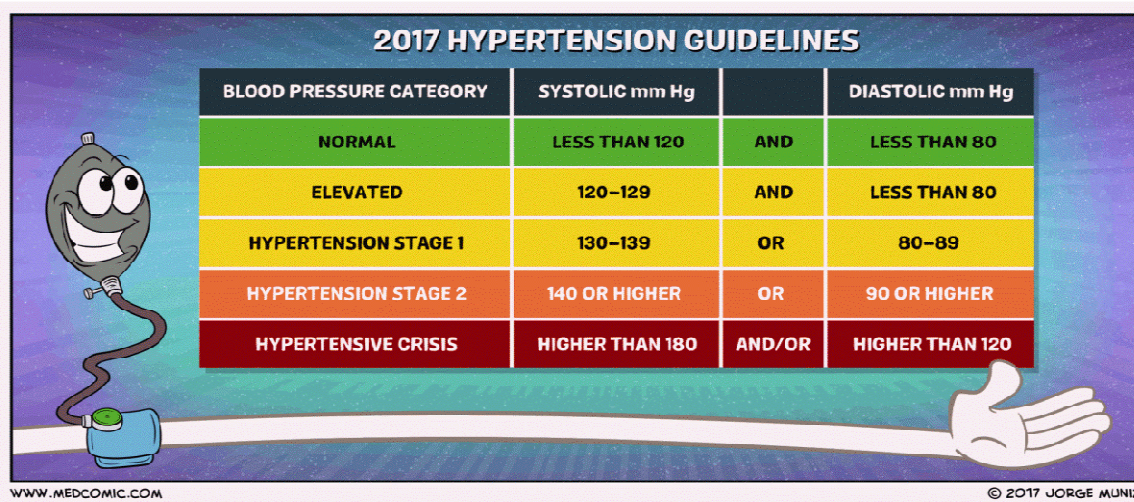
Elevated blood pressure (BP) readings were thought to be associated with, but not causing, morbidity and mortality for most of the 20th century. After large population-based studies in the 1960s, such as the Framingham study, physicians begin to focus on hypertension as a treatable risk factor for stroke, myocardial infarction (MI), peripheral vascular disease, congestive heart failure, and renal disease.(1)(2)

In the late 90s, numerous Reports predicted the occurrence of hypertensive crises in 1–2% of hypertensive individuals and figures reached as high as 7% when no antihypertensive therapies were administered. Clinical failures appear frequently due to the improper use of medication instead of the illness itself.

Hypertension is seen in the ED in the following four general ways:

- 1. “Hypertensive Emergency” or with Acute end-organ ischemia
- 2. “Hypertensive Urgency,” a historical term of no clinical value related to arbitrarily elevated BP with nonspecific symptoms. These patients probably are best referred to simply as having poorly controlled or inadequately controlled hypertension.
- 3. Mild Hypertension without end-organ ischemia
- 4. Transient hypertension related to anxiety or the primary complaint(1)

2017ACC/AHA Blood pressure categories in the new guideline are



BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg		DIASTOLIC mm Hg
NORMAL	LESS THAN 120	AND	LESS THAN 80
ELEVATED	120-129	AND	LESS THAN 80
HYPERTENSION STAGE 1	130-139	OR	80-89
HYPERTENSION STAGE 2	140 OR HIGHER	OR	90 OR HIGHER
HYPERTENSIVE CRISIS	HIGHER THAN 180	AND/OR	HIGHER THAN 120

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Poor medication adherence of patients, physician treating hypertension poorly, Insufficient access to care are among important factors which leads to hypertensive crises.

When a physician Encounter a patient with very high BP, He should be aware of common pitfalls like omission of brief rest period before BP measurement and particular attention should be given to 'white coat' effects and 'pseudo crises' In which patient blood pressure rises in a medical setting often due to anxiety about blood pressure reading and primary conditions like pain.(2)(3)

Tumlin and colleagues reported that 51 out of 94 (54%) patients presenting to an emergency room with a hypertensive emergency had taken their hypertensive medication in the preceding week and Illicit drug use is among a major risk factor for the development of hypertensive Emergency.(2)(3)(4).

1.2 STATEMENT OF PROBLEM

Epidemiological data on prevalence and clinical features of patients with hypertensive crises are lacking In spite of their relevance from public health perspective. Hypertension is a common clinical problem affecting, approximately 1 Billion individuals worldwide and Hypertensive crises are among the most miss managed acute medical problems seen today and it is also very important to know that reflex of rapidly lowering BP Is associated with poor patient outcomes.(3)(4)

Trends in the Incidence of Hypertensive Emergencies in US Emergency Departments From 2006 to 2011, published on American journal of heart association showed that the total hypertensive emergencies by their definition increased by 16.2% per year from 2006 to 2013. year-over-year hypertensive emergencies remained a rare diagnosis, with an incidence of 677 per million adult ED visits in 2006 and 1640 per million adult ED visits in 2013, yielding an estimated rate increase

of 13.9% per year ($P < 0.0001$). This year-over-year change in the incidence of hypertensive emergency remained statistically significant ($P < 0.0001$) despite of the low Incidence. (3)(5)(6)

CHAPTER 2

2 LITERATURE REVIEW

2.1 Epidemiological profile

Hypertension involves more than 1 billion individuals worldwide and it is among a well Established Cardiovascular risk factor. It has been estimated that approximately 1% of patients with hypertension will develop a hypertensive crises at some point during their lives. (3)(6)(7)

The syndrome of hypertensive emergency was first described by Volhard and Fahr in 1914 and described as signs of vascular injury to the the target organs characterized by severe accelerated hypertension, accompanied by evidence of renal disease. (2)(3)(4)(8). Hypertensive crises occurred in up to 7% of the hypertensive population Before the advent of antihypertensive therapy. Lesson in pathophysiology and clinical pearls for treating hypertension.

Hypertensive crisis is higher among African-Americans and the elderly; and it affects men about two times more frequently than are women. The lack of a primary care physician and failure to adhere to prescribed antihypertensive medications, the lack of proper follow up are among major risk factors for hypertensive crises. (4)(9)

According to a cross sectional study done on Prevalence, patterns and factors associated with hypertensive crises in one of hospital emergency department in Uganda shows The hypertensive urgencies and emergencies accounted for 32.5% and 67.5% respectively. The prevalence of hypertensive crises was 5.1%, (203/4000) of all admissions at the medical section of the accident and Emergency ward of Mulago National Referral Hospital. The study concluded Hypertensive emergencies are common and significantly associated with poor compliance to

prescribed anti-hypertensive drugs.(11) The above figure shows Significantly higher prevalence of hypertensive crises in African settings and poor control of hypertension among hypertensive patient`s which contribute significantly for morbidity and mortality among older age groups which Strongly indicate the necessity of similarpattern studies in Ethiopia.

2.2 Distribution of clinical characteristics

A study done from January to October 2017, 9900 Patients admitted to the emergency room at kassala teaching hospital in Sudan 81(.81%) patients met criteria for hypertensive crisis. Their age ranging between 28 to 85 years and the mean age \pm SD was $58 \pm (12.7)$.(10)

Among 50 patients who presented with features suggestive of Hypertensive emergency during the study period 18(22.2%) patients had hemorrhagic stroke while 7(8.6%) patients had ischemic stroke, 13(16%) patients were identified to have renal failure, retinopathy was noticed in 9(11.1%) and only 2(2.5%) patients presented with features suggestive of hypertensive encephalopathy. 18(22.2%) patients had heart failure, 11(13.6%) patients had acute coronary syndrome, stroke was detected in 25(30.8%) , of them.(10) Both studies shows neurologic complications are among the leading causes of hypertensive crises.

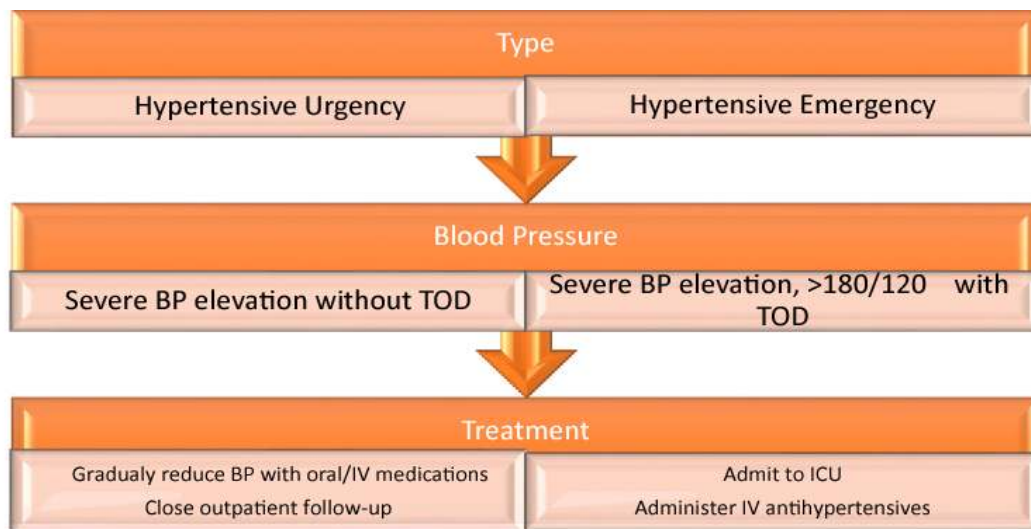
An observational prospective study done by Sanjay Gulhane et al among patients admitted with hypertensive crises in Lokmanya Tilak Medical College and Municipal General Hospital, Sion, Mumbai India shows, Predominant presenting symptoms were giddiness (51.5%), headache (40%), breathlessness (30%) and hemiparesis (34.5%). (5%) patients had GCS<5. Low GCS was significantly associated with high mortality ($p=0.001$). Mean systolic blood pressure was 207 ± 27 and mean diastolic pressure was 130 ± 22 mm of Hg. High Diastolic BP was significantly associated with mortality (P value 0.004) End organ damage was, cardiac in 71 patients (35%) neurological in 79 patients (40%), renal in 36 patients (18%), and ophthalmic 14 patients (7%). The in-hospital mortality was 19.5 percent.(13)(23)

2.3 TREATMENT GOALS

For the general treatment of hypertensive crisis most recent guidelines termed “compelling conditions”. Hypertensive urgency often requires initiating, reinitiating, modifying, or titrating oral therapy and usually does not require ICU or hospital admission.(14)

The treatment target for hypertensive urgency is a gradual blood pressure reduction over 24–48 hours to the goals as laid out in the most recent rendition of hypertension Management Guidelines on the basis of compelling indications.

FIGURE1: treatment target for hypertensive crises



Careful communication and discussion with the patient, addressing potential causes of sub optimal adherence and possible out comes of poorly controlled hypertension should be clearly explained to patients. Up to 75% of hypertensive patients may require more than single antihypertensive drug for their optimal BP control. In such circumstance fixed drug combination is recommended to improve adherence.

It has been observed in One Cohort study of 13,350 patients comparing fixed-drug with free-drug combinations that the fixed-drug combination group had superior adherence rates of 70% when compared to 42%, and a significantly lower risk of composite clinical outcomes like death, hospitalization for stroke. Acute myocardial infarction and heart failure. (17)

2.4 SIGNIFICANCE OF THE STUDY

According to WHO 2011,34%all deaths in Ethiopia are from NCD. Cardiovascular disease accounts for 34% And one cross sectional study in south western Part of Ethiopia indicated that hypertension contributes for 30.9% of cardiac diseases.(19)

The prevalence of hypertension among Ethiopian population was found to be 19.6 % (95 % CI).and similar studies show hypertension in Ethiopia is Increasing,Although There is no national prevalence study on hypertensive crises in Ethiopia. Smaller studies reported varied prevalence. Hypertension has been increasing in developing countries including Ethiopia. so it is important to have a comprehensive national study which can Asses the prevalence and profile of hypertensive crises expecting its great contribution to combating this Emerging national health burden of the country.(19)(20)

CHAPTER3

3OBJECTIVES OF THE STUDY

3.1 GENERAL OBJECTIVES

The major objective of this study is to assess the clinical profile patients with hypertensive crisis and outcomes, target organ damage involved at AAU Tikur Anbessa hospital

3.2 SPECIFIC OBJECTIVES

- To determine the demographic and baseline Characteristics and distribution of patients with hypertensive crises
- To Assess the frequency of symptoms and Signs specific clinical findings Investigation and and their frequency of occurrence
- To identify risk factors for hypertensive Emergency and associated factors
- To Assess disposition and outcomes of patients with hypertensive crises after presentation to ED

CHAPTER 4 4 METHODOLOGY

4.1 Study Area: Addis Ababa University, Tikur Anbessa Specialized hospital,

4.2 Study period JANUARY 2020- August 2020

4.3 Study Design: Retrospective Cross-sectional survey Conducted.

4.4 Source population: All adult (age ≥ 13 years) ED visits from Jan 2019 through Dec 2019

4.5 Study Population: Adults age ≥ 13 and presentation to the ED with systolic BP of 180 mmHg and higher or diastolic BP of 120 mmHg and higher.

Inclusion Criteria:

The study inclusion criteria were

Age ≥ 13 and presentation to the ED with systolic BP of 180 mmHg and higher or diastolic BP of 110 mmHg and higher.

Exclusion Criteria

This study excluded

- Female patients presenting with preeclampsia and Eclampsia
- Hypertensive patients with pseudocrisis
- Patients with head injury

Data Analysis

Descriptive statistics, including counts (percentages), means (standard deviations), medians (interquartile ranges [IQR]), and 95% confidence intervals (CIs) are reported as appropriate.

Comparisons between groups were performed using the Chi Square for proportions and Student's T-test for continuous variables, as appropriate to the distribution of the data.

Independent variables with p value < 0.02 will be chosen in bivariate analysis in order to screen

the variable associated with out come of interest. In the final multivariate analysis,Two-sided p -values < 0.05 were considered significant.

Sample Size Determination

Using proportion of 16.3% for hypertensive crises among medical emergencies and urgencies, from an observation study done at a clinical emergency unit of Tertiary Care Center in Karachi packistan

$$n = \frac{Z_{\frac{\alpha}{2}}^2 P (1 - P)}{d^2}$$

Where;

$Z_{\alpha/2}$ = critical value for normal distribution at 95% confidence interval= 1.96 ($\alpha = 0.05$).

P = Proportion = 16.3%

d = margin of error= 5%

n = required sample size

$$\text{So, } n = \frac{(1.96)^2 * (0.163) (1-0.163)}{(0.05)^2} = 215$$

Therefore, the total required sample size is 215 and with adjustment for non-response rate (5%) and the final required sample size was 227

10 STUDY VARIABLES

INDEPENDENT VARIABLES

Sociodemographic variables

Risk Factors

Drug therapies

DEPENDENT VARIABLES

Clinical findings

Complications of Hypertensive crises

Imaging findings

Drug adherence

OPERATIONAL DEFINITION

Hypertensive crises is defined as Acute Elevation in Blood pressure, which can manifest as Hypertensive Emergency with target organ damage or hypertensive Urgency without target organ damage. Associated with SBP >180 AND/OR DBP >120.

ETHICAL CONSIDERATION

Ethical clearance was secured from institution ethical review board and from Addis Ababa University department of Emergency Medicine. Patients' identifications were anonymized in the data collection tool, and data was kept confidential.

CHAPTER 5

5. RESULT

Among a total of 626 patients who was screened for Hypertensive crises From Data registry, In the Emergency unit of Addis Ababa University Tikur Anbessa Specialized Hospital In the Study period January 2019 to December 2020, 212 patients met the criteria for hypertensive crises. Of these, 109 (51.41%) had Hypertensive urgency and 103 (48.58%) had Hypertensive Emergency.

5.1 Age and Sex distribution of Hypertensive Crises

The Age range is Between 16 and 92 and The Mean age is 52.97 ± 16.483 and for male 54.199 ± 17.144 and for females 51.28 ± 15.46 , about 78% of patients Are at the age of 40 and above. Patients with hypertensive Emergency had Higher mean age (53.48 ± 15.22 vs 52.49 ± 17.64 , $p=0.663$) when compared to patients with Hypertensive Urgency.

5.2 Socio Demographic Characteristics Of the study

Table1:Sociodemographic factors Frequency and percent of sociodemographic characteristics of hypertensive crises patients,Tikuranbessa, Ethiopia

Sociodemographic variable	Overall N=212(%)	Urgency N=109(%)	Emergency N=103(%)
Sex			
Male	123(58.01%)	55(44.71%)	68(55.28%)
Female	89(41.98%)	54(60.67%)	35(39.32%)
Age(mean±SD)	(52.97±16.483)	(52.49±17.648)	(53.48±15.223)
Age			
<30	19(8.9%)	11(57.89%)	8(42.10%)
30-39	27(12.73%)	17(62.96%)	10(37.03%)
40-49	39(18.39%)	20(51.28%)	19(48.71%)
50-59	41(19.33%)	16(39.02%)	25(60.97%)
60-70	57(26.88%)	28(49.12%)	29(50.87%)
>70	29(13.67%)	17(58.62%)	12(41.37%)
Region			

AA	111(52.35%)	68(61.26%)	43(38.37%)
Tigray	7(3.3%)	4(57.14%)	3(42.85%)
Oromia	42(19.81%)	19(45.28%)	23(54.76%)
Amhara	24(11.32%)	5(20.83%)	19(79.16%)
SNNPPR	18(8.49%)	7(38.88%)	11(61.11%)
Others	10(4.71%)	6(60.00%)	4(40.00%)

5.3 Distribution of Clinical Characteristics

Table2: distribution of clinical characteristics of hypertensive crises, Tikuranbessa specialized hospital,2019.

Clinical variable	Overall N=212(%)	Urgency N=109(%)	Emergency N=103(%)
SBP(Mean±SD)	190.95±13.73	190.25±14.32	191.69±13.12
DBP(Mean±SD)	109.66±17.13	102.30±15.03	117.44±15.91
Pulse Rate(Mean±SD)	80.62±14.93	82.35±16.4	78.8±13.03
Chronic medical illness			
DM	29(13.67%)	12(46.3%)	17(53.66%)
Stroke	9(4.24%)	3(44.44%)	6(55.55%)
Heart failure	27(12.73%)	12(42.3%)	15(57.6%)
CKD	12(5.66%)	6(45.4%)	6(54.5%)
Other	42(19.81%)	28(65%)	14(35%)
No Chronic medical illness	93(43.86%)	48(51.76%)	45(48.23%)
Duration of Oral antihypertensive use			
<1yr	27(12.7%)	14(51.87%)	13(48.1%)
1-5yr	75(35.3%)	35(46.66%)	40(53.33%)
6-10yr	25(11.79%)	12(48.00%)	13(52%)
>10yr	26(12.26%)	15(57.69%)	11(42.30%)
Never used	59(27.83%)	33(55.93%)	26(44.06%)

Glasgow coma scale			
14-15	185(87.26%)	106(57.29%)	79(42.70%)
8-13	22(10.37%)	2(9.09%)	20(90.90%)
<8	5(2.35%)	1(20.00%)	4(80.00%)

With respect to Specific age Groups, the majority 57(26.8%) of patients with hypertensive crises are in the Age Range, Between 60-70yrs. 27(12.7%) are 30-39 yrs, 39(18.3%) are in the range of 40-49 and 41(19.33%) of patients are in the range of 50-59, 19(8.9%)of Case are less than 30 yrs, This Observation shows Increase in the incidence of Hypertensive Crises as age increases until The age of 70 with maximum figure was observed in the age range 60-70yrs ,and the figure Drop Again after the age of 70yrs(13.6%).the pattern is similar Among Hypertensive Urgency and Emergency. The study also revealed,the proportion of patients with hypertensive urgency had also bimodal distribution with more proportion of patients with hypertensive urgency in the age range below 50 and above 70yrs of age when compared to Emergency.more number of women Are Affected by Hypertensive urgency while the opposite is true for males, more number of males are affected by Hypertensive Emergency. This difference might be because of female populations are vulnerable to emotion related transient rise of blood pressure and the finding is statistically significant ($p=0.02$).

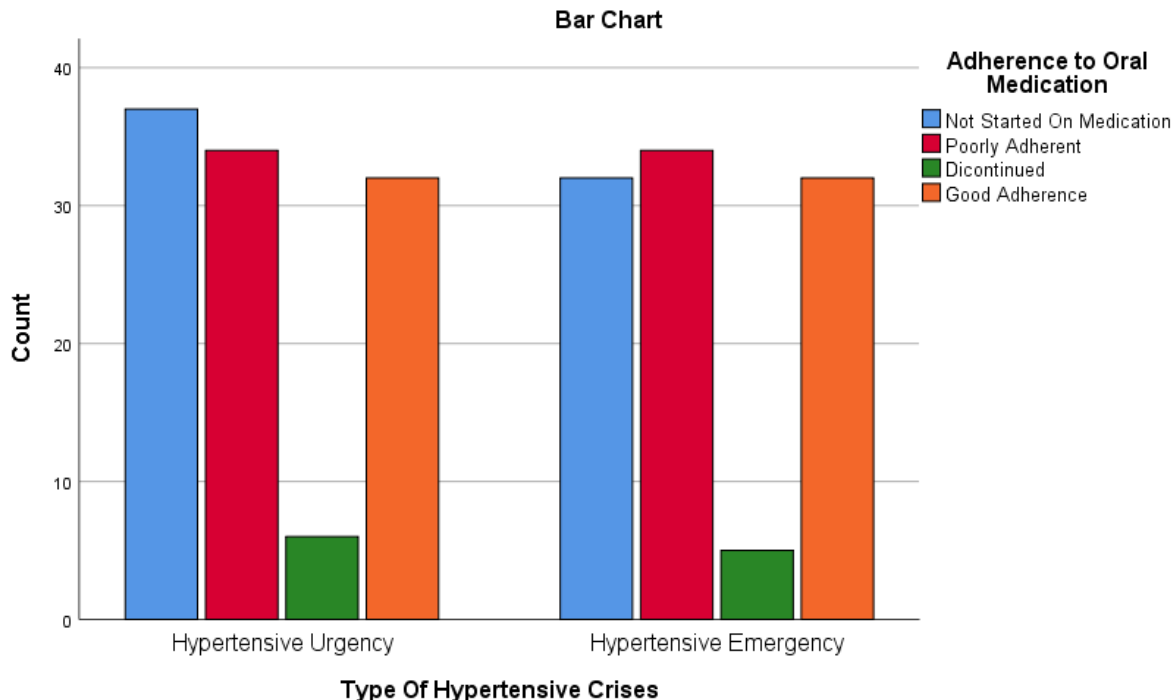
5.3 Additional Chronic Medical Illness

According to this study about 43.86% of Hypertensive crises patients had no any additional chronic Medical illness,13.67% of patients had DM,12.73% had Heart failure,5.66% had CKD and the remaining 4.24% ,and 19.81% of patients had stroke and other chronic Medical illness,respectively. About 60% of patients with hypertensive emergency had additional chronic medical illness, DM is the most common chronic medical illness in patients with hypertensive emergency(22.07%) followed by heart failure (19.48%).

As observed in this study,The fact that patients with Diabetes Mellitus and Dyslipidemic, conditions are Among important risk factors for the development of End organ damage in hypertensive patients, significant Number of patients Had diabetes mellitus and stroke in the Hypertensive Emergency group as compared to hypertensive urgency.

181 subjects(85.37%) of patients with hypertensive crises had existing Hypertension and among this 50.27% of patients are Those patients with hypertensive Urgency and 49.7% are patients with hypertensive Emergency. Of 181 known Hypertensive patients 38(21%),of patients were not started on any medication,68(37.56%) of patients had poor Adherence,11(6%) Had Discontinued Medications and 64(35.3%) had Good Adherence. when comparing the two groups majority of patients with hypertensive urgency 37(33.944%) were not started on any medication while, Majority Of patients with Hypertensive emergency 34(33.000%) Are those with poor adherence to their Medication.

Figure4: Adherence to oral medication for patients with hypertensive crises

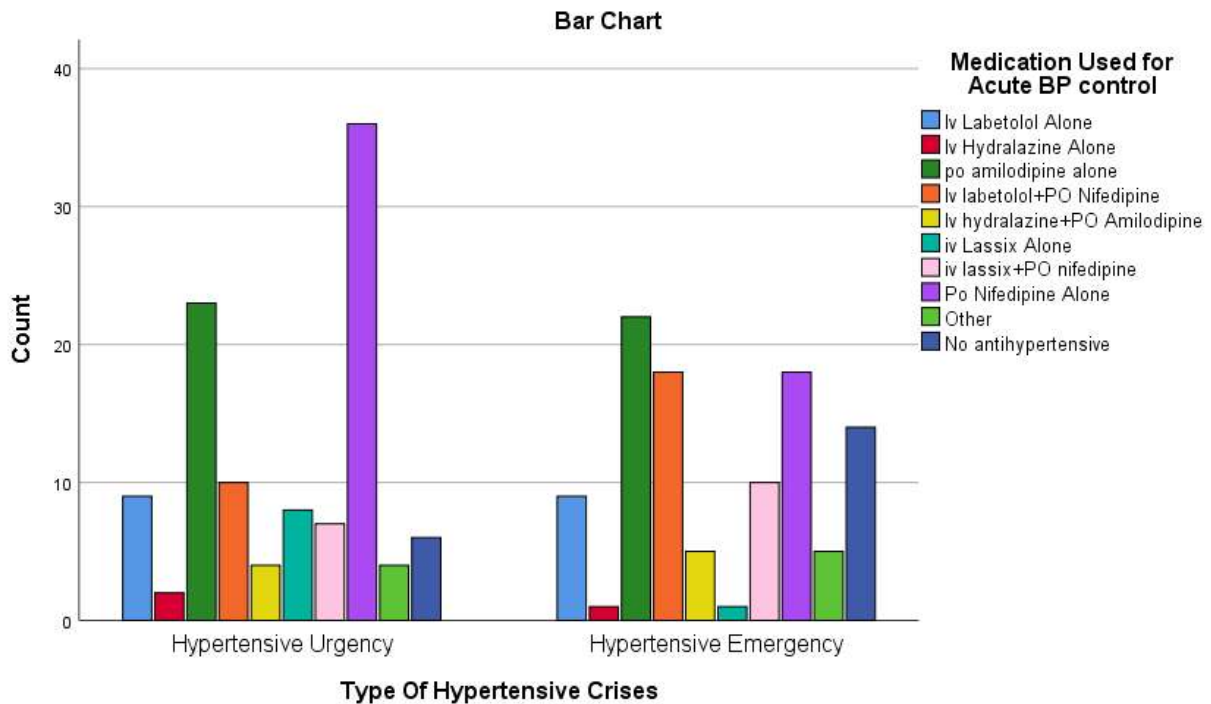


Among subjects Enrolled in this study 80(37.7%) were not taking any oral antihypertensive, at the time of their visit and the remaining 62.2% was taking Different Either single or combination class of oral antihypertensive drugs. The most common oral agent used was oral calcium channel Blocker alone, which accounts for quarter of patients followed by ACE inhibitor alone and the Most common combination drug was a combination of calcium channel blocker,thiazide diuretic and ACE inhibitor.

In the Emergency setting po Nifedipine is the most common drug used for acute Bp control in about quarter of patients presenting with hypertensive crises 53(25%), followed by po Amilodipine 45(21.22%) and combination of intravenous labetalol and oral nifedipine 28(13.20%).21(9.9%) of patients had not used any antihypertensive for Acute BP control.(*p*-0.058).Oral amilodipine is the most commonly used drug for acute Bp control in hypertensive emergency patients 22(21.35%), followed by a combination of intravenous Labetolol and oral nifedipine and oral nifedipine alone 18(17.47%) both.

Those patients who donot Receive Any medication for acute BP control is mainly because of the absence of specific Indication,like patients with ischemic stroke with target range,Despite higher Blood pressure readings.

Figure 5:Medication use for Acute BP control for patients with hypertensive crises



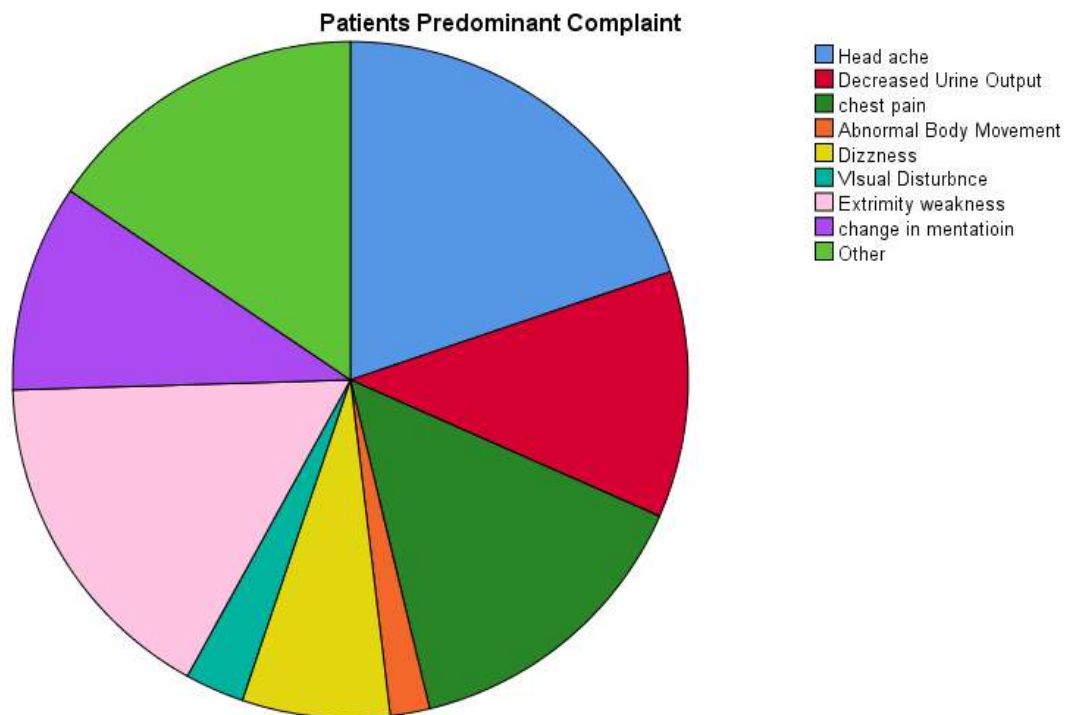
Independent sample t test Analysis showed, the Mean Systolic blood pressure for patients with hypertensive urgency is lower than that of hypertensive Emergency 190.25 ± 14.323 and 191.69 ± 13.11 Respectively, and the mean Diastolic blood pressure is (105.78 ± 15.25) for Hypertensive urgency and (112.41 ± 18.340) for Hypertensive Emergency.

5.4 Predominant patients complain and frequency of Occurence

Head ache in 42 (19.81%) of patients and Extrimity weakness was Complain of 35 (15.09%) patients with hypertensive crises followed by Other non specific and minor complains 33(15.56),chest pain31(14.62),Decreased urine out put 25(11.79%)change in mentation 21(9.9%).

Of hypertensive Urgency patients 29(26.6%) ofpatients complain head ache; while 25(22.93%) of patients,presented with other Non specific Complain and 16(16.51%) Major complain was Dizziness. For patients with hypertensive Emergency the Major complain was Extremity weakness 28(27.18),followed by change in Mentation18(15.53)% .

Figure 6: predominant patients complain among hypertensive crises



5.5 Predominant physical finding among hypertensive crises

More than half of patients 58(53.2%) with hypertensive urgency had no any positive physical finding At presentation and the most common physical finding in patients with hypertensive emergency is Focal neurologic deficit which accounts for 31% of hypertensive Emergency patients, followed by low GCS and positive chest findings. positive physical finding in patients with hypertensive urgency is mainly because of existing underlying chronic medical illness whose higher Blood pressure is not associated with acute condition.

185(87.2%) of patients had GCS of 14-15 at presentation, 22(10.3%) had GCS 8-13 and the remaining 5(2.3%) percent of cases Has Glasgow coma score of ≤ 8 . patients with hypertensive urgency accounts for 57.29% of patients with GCS 14-15 and In contrast to this, patients with hypertensive emergency accounts for 90.9% of patients with GCS of 8-13 and 80% of patients with GCS <8 . this indicates strong association Between low GCS and hypertensive Emergency when compared to hypertensive urgency.

Figure8

Type of Hypertensive Emergency * Type Of Hypertensive Crises
Crosstabulation

		Hypertensive emergency(no)	Total
Type of Hypertensive Emergency	Hypertensive Encephalopathy	3	3
	Acute kidney injury	12	12
	Acute pulmonary Edema	1	1
	Myocardial Infarction	20	20
	Unstable angina	2	2
	Acute aortic dissection	3	3
	Hemorrhagic stroke	37	37
	Sub Arachinoidal hemorrhage	2	2
	Ischemic stroke	23	23
	Total		103

5.6 Frequency of physical findings in Hypertensive Emergency patients

The Most frequent signs of presentations among the study participants with Hypertensive Emergencies were neurological deficits accounting for 31.06% followed by no pertinent physical finding 25.24%, low GCS 17.47%, positive chest finding 17.47%, other finding 6.79%, peripheral Edema, (4.85%).

Table 3

5.7 Imaging Results for hypertensive crises Tikur Anbessa Hospital, Ethiopia

		Hypertensive urgency	Hypertensive Emergency	Total	Pvalue
ECG					0.043
	Sinus Tachycardia	4	8	12	
	Sinus bradycardia	0	4	4	
	Life threatening Arrhythmia	1	3	4	
	ST Segment changes	4	6	10	
	T wave changes	4	12	16	
	Atrial fibrillation	3	2	5	
	Non specific ST & T wave change	9	10	19	
	ECG not available	34	18	52	
	ECG Normal	44	33	77	
	Others	6	7	13	

Chest Xray					0.041
	Normal	19	20	39	
	Pulmonary edema	6	9	15	
	consolidation	6	7	13	
	Infiltration	4	13	17	
	Pleural effusion	4	3	7	
	others	5	2	7	
	Not available	65	49	114	
Brain CT					0.00
	Normal	12	7	19	
	Ischemic change	3	21	24	
	Intracranial hemorrhage	0	29	29	
	Sub arachinoid hemorrhage	0	1	1	
	Not available	6	2	8	
	Other	3	2	5	
	Not indicated	85	41	126	

5.7 Disposition and Out come

Out of 103 hypertensive Emergency patients,37.86% were discharged from ED,29.1% ward Admission,18.4% ICU admissions,11.65%were ED Death,2.9% were transfer out. And when compared to hypertensive urgency patients with hypertensive emergency are associated with poor out come.

Table5

Disposition And Out Come * Type Of Hypertensive Crises Crosstabulation

		Type Of Hypertensive Crises		Total
		Hypertensive Urgency	Hypertensive Emergency	
Disposition And Out Come	Discharged from ED	79	39	118
	Admitted to ward	27	30	57
	Admitted to ICU	0	19	19
	Died in the ED	0	12	12
	Transfer out	3	3	6
Total		109	103	212

Multivariate analysis Model building was done. Adjusted Estimate was obtained using likelihood ratio. Significant association was obtained with predominant patients complain like Decreased urine out put,chest pain, and Higher Diastolic Bp and patients clinical presentation like

Extremity weakness, Change in mentation were significantly associated with Hypertensive Emergency.

Table 6

Clinical factors associated with hypertensive Emergency Tikuranbessa Hospital

	Un Adjusted Estimates		Adjusted estimates	
	COR(95%CI)	P value	AOR(95%CI)	Pvalue
Age				
<30	1.030(0.319-3.329)	0.960	1.163(0.228-5.933)	0.856
30-39	0.833(0.284-2.442)	0.740	1.1355(0.290-6.334)	0.699
40-49	1.346(0.510-3.549)	0.548	1.310(0.306-0.599)	0.716
50-59	2.214(0.840-5.836)	0.108	3.915(0.994-15.425)	0.051
60-70	1.467(0.595-0.620)	2.214	2.289(0.643-8.510)	0.201
>70	Constant		Constant	
Sex				
Male	0.524(0.301-0.913)	0.022	2.057(0.939-4.510)	0.072
Female	Constant		Constant	
Additional chronic medical illness				
DM	1.158(0.54-2.45)	0.702	1.431(0.466-4.396)	0.532
Stroke	1.310(0.329-5.211)	1.310	4.816(0.711-32.605)	0.107
Heart failure	1.429(0.589-3.463)	0.430	3.858(0.910-16.357)	0.067
CKD	1.25(0.357-4.431)	0.722	1.633(0.268-9.941)	0.595
Other	0.564(0.26-1.225)	0.148	0.684(0.228-2.059)	0.500
No chronic medical illness	Constant		Constant	
Predominant patients complain				
Decreased urine output	3.536((1.080-11.574)	0.037	4.657(1.090-19.899) 24.825(5.351-	0.038
Chest pain	21.750(6.25-75.69)	<0.01	115.165)	<0.001
Extremity weakness	19.125(4.701-77.801)	<0.01	25.380(4.456-	<0.001
Change in mentation	19.125(4.701-77.801)	<0.001	144.543)	<0.001

Other	Constant		constant	
Diastolic BP at presentation				
80-90	constant		constant	
91-100	1.038(0.366-2.945)	0.943	0.950(0.115-3.903)	0.930
101-109	1.00(0.225-4.436)	0.462	0.046(0.005-3.95)	0.760
110-120	2.800(1.159-6.762)	0.22	3.470(1.336-9.013)	0.011
121-130	10.200(3.735-27.856)	<0.001	12.00(4.046-35.95)	<0.001
>130	14.250(3.906-51.981)	<0.001	22.415(5.428-92.561)	<0.001

CHAPTER 6

6 Discussion

Although there are Inconsistencies, Elevation of Blood pressure >180/120 Considered as Hypertensive Crises.

A rapid severe elevation in Blood pressure with End organ damage is known as hypertensive Emergency and Rapid severe elevation in BP In the absence of Evidence of organ injury is known as hypertensive urgency. Although data pertaining to hypertensive crises is lacking in Ethiopian setting, this study might provide an estimate of profile of patients and Related conditions.

Patients presenting with hypertensive crisis typically have had Either chronically Elevated BP Or Total un awareness about condition of their Bloodpressure. Non adherence to medication, sub therapeutic treatment regimens, and drug Induced etiologies have been attributed to the

development of hypertensive crises. In the Emergency unit of Addis Ababa University Tikur Anbessa Specialized Hospital In the Study period January 2019 to December 2019, 212 patients met the criteria for hypertensive crises. Of these, 103 (53.3%) had HU and 109 (51.41%) had HE. This narrow difference in proportion between the two groups is a similar finding with one prospective cross sectional study done by Santosh B Salagre et al, Prevalence and Clinical Profile of Patients of Hypertensive Crisis in a Tertiary Care Hospital. As Tikur Anbessa hospital is a tertiary hospital and more patients, with abnormal investigation results and critically ill are more likely to be referred to this hospital. This can result in a higher number of patients with hypertensive emergencies than the general population in this analysis.

In this study Mean age is 52.97 ± 16.483 and for male 54.199 and for females 51.28 , about 78% of patients are at the age of 40, and above. Patients with hypertensive emergency had higher mean age (53.48 ± 15.22 vs 52.49 ± 17.64 , $p=0.663$) when compared to patients with hypertensive urgency. This study is consistent with other studies which report the mean age for patients with hypertensive crises is above 50. Irene Nakalema *et al*, reported that participants age range was 18 – 93 years. The mean age of the participants was 55.3 ($SD \pm 17.1$). The higher prevalence of hypertension in older age groups in general and other comorbid illness, age related physiologic changes might be responsible for this finding.

Most common complaint in hypertensive urgency patients is head ache followed by other non specific complaint and dizziness. For patients with hypertensive emergency the major complaint was extremity weakness followed by change in mentation, this result keep in touch with other studies like Santosh B Salagre *et al*, Patrick J. Shao *et al*., and a report by Shailendra Kumar 'Clinical Study of Hypertensive Crisis in Medicine Ward'. And this finding also shows neuro related conditions are the leading complaint and complications among patients with hypertensive crises.

It is well known that non adherence to anti hypertensive treatment is responsible for hypertensive crises and end organ related morbidity and mortality. Because of lack advanced laboratory which can analyse biomedical adherence of patients and, because this study is retrospective in nature which makes the use of more accurate adherence assessment scale like Morisky adherence Assessment scale or visual analog Assessment scale, Assessment for

adherence In this study is based on subjective information from the patients documented on chart.the 2013 Frankfurt Hypertension Unit reported that 53% were found to be Nonadherent by using LC-MS analysis for antihypertensive drugs or their metabolites in urine among 76 treatment-resistant hypertensive patients, who did not achieve blood pressure control on a quadruple antihypertensive treatment. Studies suggest that poor adherence to antihypertensive is responsible for about 9% of cardiovascular related events in Europe. According to WHO, poor medication access and unequal access to medication is responsible for adherence related complications in developing countries like Ethiopia.

In this study 21% of patients were not started on any medication, 37.56% of patients had poor adherence, 6% had discontinued their Medications and 35.3% had Good Adherence. This shows more than 60% of patients in this study are not getting their antihypertensive medications properly, which can contribute for hypertension related complications.

Comparative study between the two Groups in this study shows, higher proportion of patients who were not started medication and discontinued medication are those patients with hypertensive urgency and poor medication adherence is common among patients with hypertensive Emergency. This might be because of more patients with hypertensive urgency are younger, New to the diagnosis of Hypertension and less likely to Accept their medical condition start And continue their medication, and more likely to try lifestyle modifications when compared to patients with hypertensive Emergencies.

Among subjects Enrolled in this study 80(37.7%) were not taking any oral antihypertensive, at the time of their visit and the remaining 62.2% was taking different Either single or combination class of antihypertensive drugs. and drug selection would be based on factors like patient specific attributes (volume status and presence of comorbidities), and characteristics of the drug(Availability ,cost,side effects)and so on. The most common oral agent used was oral calcium channel blocker alone, which accounts for quarter of patients followed by ACE inhibitor alone and the most common combination drug was calcium channel blocker, thiazide diuretic and ACE inhibitor.

Out of 212 subjects Included in the study, 118(55%) Discharged from ED,57(26.8%) ward admissions, 19(8.9%) admission to ICU,12(5.6%) ED Deaths and 2.8% of them are transfer out and All the Admission to ICU and deaths Occurred amongst patients with hypertensive Emergency.and patients with hypertensive Emergency were responsible for 33% of ED discharge,47.3% of ward Admissions,and 50% of transfer outs. This analysis is similar to one study done at urban emergency department of a tertiary referral hospital in Tanzania, in this study all ICU Admissions and ED deaths Are from hypertensive Emergency patients ,Although majority of patients were ward admissions(66.5%) and 31.5% were home discharges.

CHAPTER7 CONCLUSION & RECOMMENDATION

7.1CONCLUSION

This study concluded slightly higher number of patients with hypertensive crises presenting to emergency unit of our hospital were hypertensive urgencies and significant number of patients had also hypertensive emergency, this might indicate the importance of thorough evaluation and investigation to identify these clinical conditionsfor Early intervention. According to this study although hypertensive crises affects wider range of population age group,about 80% are those with the age of 40 and above. Majority of patients had already existing hypertension and Diabetes mellitus is the most common associated medical illness ,this indicate majority of patients are aware of their medical condition and the fact that most patients are either not started on any medication or poor adherence to their medication shows strict medical follow up and Education is helpful in reducing the incidence of hypertensive crises.

7.2 RECOMMENDATION

Since this study revealed the majority of patients with hypertensive crises present with complain of headache, extremity weakness or other non specific complain, and the fact that this study also showed Most patients with hypertensive crises lack completeInvestigations,it is

mandatory to take blood pressure and Evaluate and work up for possible hypertensivecrisesand Related target organ injury for patients presenting to ED with any type primary Complains. Similar to most other studies, patients with hypertensive Emergency in this study are associated with poor outcome when compared to hypertensive urgency.so this study Recommendsthe importance of early detection, proper follow up to arrest further progression of patients with hypertensive urgency and hypertension in general.

As multivariate analysis in this study showed patients condition like, Male sex, higher Diastolic BP and complains like chest pain, decreased urine out put, Extremity weakness are associated with hypertensive Emergency, this conditions further guide for prioritizing and early full work up and proper Management.

7.3LIMITATIONS OF THE STUDY

Certain limitations like poor chart documentation, ways of documentation, Incomplete investigations,and Missed charts ,and as this study is Retrospective in nature other important Sociodemographic factors like educational status,dietary,smoking,alcoholconsumption,exercise and other important life style associations with hypertensive crises cannot be assessed.

CHAPTER 8

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ANNEX: QUESTIONNAIRES

Age in years

- <30**
- 30-39**
- 40-49**
- 50-59**
- 60-70**
- >70**

Gender

- Male**
- Female**

Region

- AA**
- Amhara**
- Oromia**
- Tigrai**

- SNNPR
- Other

Hypertension

- *No*
- *Yes*

Diabetes mellitus

- *No*
- *Yes*

Chronic medical illness

- **DM**
- **Stroke**
- **Heart failure**
- **CKD**

Duration of oral antihypertensive

- *<1yr*
- *1-5yr*
- *6-10yr*
- *>10yr*
- *Never used*

Oral antihypertensive used

- *Beta blocker alone*
- *ACE Inhibitors alone*
- *Thiazide diuretic alone*

- *Calcium channel blocker alone*
- *Bethablocker+thiazide diuretic*
- *Calcium channel blocker+thiazide diuretics*
- *Calcium channel blocker +loop diuretics*
- *Loop diuretics+potassium sparing diuretics*
- *Unspecified*
- *Other*

Medications for acute BP Control

- *IV Labetolol alone*
- *Iv hydralazine alone*
- *Po amlodipine*
- *IV labetolol+ponifedipine*
- *IV hydralazine +ponifedipine*
- *Iv lassix alone*
- *IV Lassix+ponifedipine*
- *Po nifedipine alone*
- *Other*
- *No antihypertensive*

Adherence to oral medication

- *Not started on medication*
- *Poorly adherent*
- *Discontinued*
- *Good adherence*

Predominant patients complain

- *Head ache*
- *decreased urine out put*
- *chest pain*
- *abnormal body movement*
- *Dizziness*

- *Visual disturbance*
- *Extremity weakness*
- *Change in mentation*
- *Other*

Predominant physical findings

- *Low GCS*
- *Positive chest finding*
- *Peripheral edema*
- *Focal neurologic deficit*
- *Other*
- *No pertinent physical finding*

Glascow Coma scale at Admission was

- 14-15*
- 8-14*
- ≤8*

What was the systolicBp of the patient at presentation?

- <180*
- 180-190*
- 191-200*
- 201-210*
- 211-220*
- >220*

What was the diastolic BP of the patient at at initial presentation?

- *80-90*
- *91-100*
- *101-109*
- *110-120*
- *≥120*

Type of hypertensive emergency

- *Hypertensive encephalopathy*
- *Acute kidney Injury*

- *Acute pulmonary edema*
- *Myocardial infarction*
- *unstable Angina*
- *acute Aortic dissection*
- *sub Arachinoidal hemorrhage*
- *Ischemic stroke*

Brain CT

- Normal*
- Ischemic change*
- ICH*
- Sub arachinoid hemorrhage*
- Other(specify)*
- Not available*
- Not indicated*

Chest Xray

- Normal*
- Evidence of pulmonary edema*
- Infiltrates*
- Consolidation*
- Pleural effusion*
 - Other(specify)*
 - Not available*
 - Not indicated*

ECG

- Normal*
- Sinus tachychardia*
- Sinus bradycardia*
- Diffuse T wave inversions*
- ST Segment Elivations which fulfillls STEMI Criteria*

- Non specific ECG Changes*
- Life threatening Ahythmias*
- Other specify*

What was the disposition and out come?

- Discharged from ED*
- Admitted to ward*
- Admitted to ICU*
- Died in the ED*
- Other (specify)*

Type of hypertensive crises

- Hypertensive urgency*
- Hypertensive emergency*

Distribution of clinical characteristics

A study done from January to October 2017, 9900 Patients admitted to the emergency room at Kassala Teaching Hospital in Sudan. 81(.81%) patients met criteria for hypertensive crisis and enrolled in this study. Their age ranging between 28 to 85 years and the mean age \pm SD was $58 \pm (12.7)$. Of these, while 31 (38.3%) patients had Hypertensive urgency and (61.7 %) patients were diagnosed as having Hypertensive emergency. 50 (61.7%) patients urban residents and 28 (35.8%) patients housewife. Regarding the clinical presentation, Headache was found in 60(74.1 %), Dizziness in 34(42.0 %), vomiting in 8(9.9%) and epistaxis in 2(2.5%). The majority were female 44(54.3) patients.

Among 50 patients who presented with features suggestive of Hypertensive emergency during the study period 18(22.2%) patients had hemorrhagic stroke while 7(8.6%) patients

had ischemic stroke, 13(16%) patients were identified to have renal failure, retinopathy was noticed in 9(11.1%) and only 2(2.5%) patients presented with features suggestive of hypertensive encephalopathy. (18(22.2%) patients had heart failure, 11(13.6%) patients had acute coronary syndrome, stroke was detected in 25(30.8%) , of them (37).

an observational prospective study done by Sanjay Gulhane et al among patients admitted with hypertensive crises in Lokmanya Tilak Medical College and Municipal General Hospital, Sion, Mumbai India shows

Predominant presenting symptoms were giddiness (51.5%), headache (40%), breathlessness (30%) and hemiparesis (34.5%). 10 (5%) patients had GCS<5, 21 patients had GCS 5-8 and 169 patients had GCS >8. Low GCS was significantly associated with high mortality ($p=0.001$). Mean systolic blood pressure was 207 ± 27 and mean diastolic pressure was 130 ± 22 mm of Hg. High diastolic BP was significantly associated with mortality (P value 0.004) End organ damage was, cardiac in 71 patients (35%) neurological in 79 patients (40%), renal in 36 patients (18%), and ophthalmic 14 patients (7%). The in-hospital mortality was 19.5 percent.(B).

2 GRAPHS(B)

TREATMENT GOALS

For the general treatment of hypertensive crisis most recent guidelines termed “compelling conditions” (Whelton 2017)., . Hypertensive urgency often requires initiating, reinitiating, modifying, or titrating oral therapy and usually does not require ICU or hospital admission (Muesan 2015). The treatment target for hypertensive urgency is a gradual blood pressure reduction over 24–48 hours to the goals as laid out in the most recent rendition of hypertension management guidelines on the basis of compelling indications (James 2014; Muesan 2015; Whelton 2017) with the treatment of hypertensive urgency is overaggressive correction because no benefit, but potential harm, may be associated with too rapid a decrease in blood pressure (Bertel 1987; Reed 1986; Bannan 1980).(H)

SIGNIFICANCE OF THE STUDY

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