

Article

Clinical analysis of emergencies in the patients with Hypertension

Dr. Pratik Mansukhlal Doshi¹, Dr. Harshil Mehta^{2,*} and Dr. Dharmendra M Gohil³

¹ Associate Professor, Department of Emergency Medicine, P.D.U Government Medical College Rajkot, Gujarat, India.

² Assistant Professor, Department of Emergency Medicine, Gujarat Adani Institute of Medical Science, Bhuj, Kutch, Gujarat, India.

³ Professor, Department of Emergency Medicine, P.D.U Government Medical College Rajkot, Gujarat, India.

* Correspondence: harshilkmehta@yahoo.com

Academic Editor: Ajay Verma

Received: 2 December 2022; Accepted: 15 February 2023; Published: 31 March 2023.

Abstract: Background: Hypertension affects individuals of all classes and across all groups. The relationship between blood pressure and the risk of cardiovascular disease events is continuous and independent of other risk factors.

Aim and Objectives: The present study aimed to identify various modes of presentation and the clinical profile of hypertensive emergencies in our hospital.

Materials and Methods: Data were collected from 100 patients admitted to this hospital over a period of two years. Patients who presented with an elevated blood pressure of systolic blood pressure >180mmHg or diastolic blood pressure >110mmHg, with a history of acute target organ damage, or with laboratory evidence of acute target organ damage were included in the study.

Results: Of the 100 patients studied, 88 were known hypertensives, among whom 54 had discontinued their antihypertensives before the incident, while the remaining 46 patients continued their medication. Among the 100 patients, 28 had diabetes mellitus and 28 had dyslipidemias. Out of 100 patients with hypertensive emergencies, 12 died before discharge, resulting in a hospital mortality rate of 12%. All expired patients had intracerebral hemorrhage.

Conclusion: Known hypertensives are at a higher risk of presenting with acute target organ damage associated with hypertensive emergency. The presence of diabetes mellitus and dyslipidemia increases the chance of developing hypertensive emergencies.

Keywords: Hypertension emergency; Medicine; Diabetes.

1. Introduction

Hypertension is a global health issue affecting individuals across all classes and groups. The relationship between blood pressure and the risk of cardiovascular disease events is continuous and independent of other risk factors [1]. It is the leading reason for office visits to physicians, and it accounts for the most drug prescriptions. Hypertension is a major risk factor for heart disease and stroke, which are the first and third leading causes of death in developing countries, and it is the number one attributable risk for death worldwide [2,3].

Despite its high prevalence and significant impact on public health, hypertension remains neglected. It affects all populations and is estimated to account for 6

Hypertensive emergency can result from chronic hypertension, non-compliance with medication, or the initial presentation of essential hypertension [4]. Incidences of hypertensive emergencies are increasing, and it is crucial to identify the various modes of presentation and clinical profile of hypertensive emergencies. Therefore, the present study aimed to investigate hypertensive emergencies in our hospital to gain insights into this condition.

2. Materials and Methods

The present study was conducted in patients admitted to Coimbatore Medical College Hospital over a period of two years.

2.1. Inclusion criteria

Patients above the age of 18 years with systolic blood pressure ≥ 180 mmHg or diastolic blood pressure ≥ 110 mmHg and evidence of target organ damage, either clinically or on laboratory findings, were included in the study.

2.2. Exclusion criteria

Patients less than 18 years of age, those with chronic renal failure, valvular heart disease, or other secondary causes of hypertension were excluded from the study.

2.3. Data source

Data was collected from 100 patients admitted to Coimbatore Medical College Hospital with clinical and laboratory evidence of hypertensive emergency.

2.4. Study design

This was a descriptive study.

2.5. Study protocol

A detailed history was taken, which included presenting symptoms, hypertension-related history with emphasis on drug compliance, and other relevant information. Blood pressure was recorded at the time of admission, after one hour, after 24 hours, and at the time of discharge.

Detailed clinical examination was performed, including examination of the respiratory system, cardiovascular system, abdomen, and central nervous system. Fundoscopic examination was performed in all patients. Blood samples were collected for biochemical analysis.

Routine investigations included HB%, total count, differential count, ESR, blood sugar, serum urea, serum creatinine, serum electrolytes, serum total cholesterol, serum triglycerides, HDL, LDL, microalbuminuria, and urine analysis. Chest x-ray, urine analysis, and serum electrolytes were also performed.

Patients with clinical suspicion of neurological deficits underwent computed tomography of the brain, those with cardiovascular dysfunction were evaluated with ECHO, and those with renal dysfunction underwent renal sonography.

Data was analyzed using Microsoft Excel software.

3. Results

A total of 100 patients were included in the present study, out of which 58 (58%) were males (Table 1). The Male:Female ratio was found to be 1.4:1. The mean age of the patients was 62 years, with a range of 33 to 75 years in males and 30 to 70 years in females. The mean age for males and females were 51 years and 56 years, respectively.

The age distribution of the patients showed that 34 patients were less than 50 years old and 66 patients were over 50 years old (Table 2). The most common presenting complaints were chest pain and dyspnea, which were seen in 36 patients. Neurological symptoms were observed in 28 patients, among whom ischemic infarction was the most common (20 patients), followed by intra-cerebral hemorrhage (12 patients) and subarachnoid hemorrhage (4 patients). The target organ involvement included acute left ventricular failure (26%), intra-cerebral hemorrhage (20%), ischemic infarction (18%), myocardial infarction (14%), unstable angina (12%), subarachnoid hemorrhage (4%), hypertensive encephalopathy (4%), and vision defects (2%) (Table 3).

Of the 100 patients studied, 88 patients were known hypertensives, among whom 54 patients had discontinued antihypertensives before the incident and 46 patients were continued on their medication. Among the 100 patients, 28 patients had diabetes mellitus and 28 patients had dyslipidemia. Twelve patients

died before discharge, resulting in a hospital mortality rate of 12%. All the expired patients had intra-cerebral hemorrhage.

Table 1. Gender wise distribution of study participants

Gender	Number	Percentage (%)
Male	58	58
Female	42	42
Total	100	100

Table 2. Age wise distribution of study participants

Age (Years)	Number	Percentage (%)
<50 Years	34	34
>50 Years	66	66
Total	100	100

Table 3. Distribution according to target organ involvement

Target Organ Involvement	Number	Percentage (%)
LVF	26	26
ICH	20	20
ischemic infarct	18	18
Myocardial Infarction	14	14
Unstable angina	12	12
SAH	4	4
Hypertensive Encephalopathy	4	4
Vision Defect	2	2

4. Discussion

In the present clinical study of hypertensive emergencies in a medical college, there is a mild male predilection for hypertensive emergencies. Martin *et al.*, [5] observed in their study on hypertensive crisis that 55% of patients with hypertensive emergencies were males. The proportions of males in hypertensive emergencies were also higher in the study by Zampoglione *et al.*. This is probably due to an increased susceptibility of males compared with females to hypertension-related target organ damage [6].

This is also due to the fact that postmenopausal female hemodynamics are not very different from the male profile with regard to blood pressure. The majority of female patients belonged to the postmenopausal age group, which shows the susceptibility of the postmenopausal age to end-organ damage [7].

Decade-wise distribution of age shows the largest groups belonging to the fifth and sixth decade at the time of presentation, with 30% and 26%, respectively [8]. Analyzing the presenting symptoms, the largest group of patients in the present study presented with chest pain and dyspnea, followed by neurological deficit [8,9].

Zampoglione *et al.*, [10] in their study had more patients presenting with chest pain (36%) and neurological deficit (28%), respectively. The majority of patients in the present study were previously known hypertensives (88%). Martin *et al.*, [5] noticed a large number of patients (83%) in their study to be previously diagnosed hypertensives.

Diabetes mellitus and dyslipidemia were the other risk factors present in the present group of patients. Patients with diabetes mellitus and dyslipidemia were 28% and 28%, respectively. The prevalence of arterial hypertension in diabetic patients is greater when compared with that in non-diabetic patients. Metabolic abnormalities, hyperglycemia, hyperinsulinemia, and dyslipidemia may play a role in the pathogenesis and complications of arterial hypertension, as seen in the present study [11].

The highest recorded systolic blood pressure was 250mmHg, with a mean systolic blood pressure of 215mmHg. The highest diastolic blood pressure recorded was 160mmHg, with a mean of 130mmHg. Martin *et*

al., [5] in their study reported a mean systolic blood pressure of 193+/- 26mmHg in their patients and a mean diastolic blood pressure of 129+/- 12mmHg.

The higher levels of blood pressure would have added to more severe target organ damage in these patients, with an adverse outcome. The evaluation of fundus revealed changes ranging from hypertensive retinopathy to papilledema in 50% of patients. Papilledema was seen in 12% of patients, which is evidence of ongoing target organ damage in these patients

Microalbuminuria was seen in 32% of the patients, which puts these patients at a higher risk for hypertension-related renal disease compared to patients without proteinuria. Computed tomography of the brain showed intracerebral hemorrhage as the most common cause of neurological target organ damage, followed by cerebral infarct and subarachnoid hemorrhage. Voltage criteria suggestive of left ventricular hypertrophy on ECG were seen in 20% of patients, and 18% had left ventricular hypertrophy by echocardiography. The outcome of the study showed an in-hospital mortality of 12% among these patients. All patients who expired had intracerebral hemorrhage. In conclusion, our study highlights the increased risk of acute target organ damage associated with hypertensive emergency in known hypertensive patients. Furthermore, the presence of co-morbidities such as diabetes mellitus and dyslipidemia further increases the likelihood of developing hypertensive emergency. These findings emphasize the importance of regular blood pressure monitoring and adherence to antihypertensive medications, particularly in high-risk individuals with co-existing conditions.

Author Contributions: All authors contributed equally to the writing of this paper. All authors read and approved the final manuscript.

Conflicts of Interest: "The authors declare no conflict of interests."

References

- [1] Carey, R. M., Muntner, P., Bosworth, H. B., & Whelton, P. K. (2018). Prevention and control of hypertension: JACC health promotion series. *Journal of the American College of Cardiology*, 72(11), 1278-1293.
- [2] Wu, C. Y., Hu, H. Y., Chou, Y. J., Huang, N., Chou, Y. C., & Li, C. P. (2015). High blood pressure and all-cause and cardiovascular disease mortalities in community-dwelling older adults. *Medicine*, 94(47), e2160.
- [3] Kasiakogias, A., Rosei, E. A., Camafort, M., Ehret, G., Faconti, L., Ferreira, J. P., Brguljan, J., Januszewicz, A., Kahan, T., & Manolis, A. (2021). Hypertension and heart failure with preserved ejection fraction. *European Society of Hypertension*, 39, 1522-1545.
- [4] Vaidya, C. K., & Ouellette, J. R. (2007). Hypertensive urgency and emergency. *Hospital Physician*, 3, 43-50.
- [5] Martin, J. F. V., Higashiana, É., Garcia, E., Luizon, M. R., & Cipullo, J. P. (2004). Hypertensive crisis profile: prevalence and clinical presentation. *Arquivos Brasileiros de Cardiologia*, 83, 125-130.
- [6] Nkoke, C., Jingi, A. M., Noubiap, J. J., Teuwafeu, D., Nkouonlack, C., Gobina, R., ... & Dzudie, A. (2022). Gender differences in cardiovascular risk factors, clinical presentation, and outcome of patients admitted with a hypertensive crisis at the Buea Regional Hospital, Cameroon. *International Journal of Hypertension*, 2022, Article ID 3062526, <https://doi.org/10.1155/2022/3062526>.
- [7] Lima, R., Wofford, M., & Reckelhoff, J. F. (2012). Hypertension in postmenopausal women. *Current Hypertension Reports*, 14, 254-260.
- [8] Vinayak, Y., Mukkara, M., Reddy, A. K. S., Devi, N. H., Kumar, M. K., & Jonnakuti, R. (2020). Clinical profile of hypertensive patients presenting to the emergency department. *Journal of Clinical and Scientific Research*, 9(4), 224-228.
- [9] Sharma, N., Das, R., Kaur, J., Ahluwalia, J., Trehan, A., Bansal, D., ... & Marwaha, R. K. (2010). Evaluation of the genetic basis of phenotypic heterogeneity in north Indian patients with thalassemia major. *European Journal of Haematology*, 84(6), 531-537.
- [10] Zampaglione, B., Pascale, C., Marchisio, M., & Cavallo-Perin, P. (1996). Hypertensive urgencies and emergencies: prevalence and clinical presentation. *Hypertension*, 27(1), 144-147.
- [11] Cercato, C., Mancini, M. C., Arguello, A. M. C., Passos, V. Q., Villares, S. M. F., & Halpern, A. (2004). Systemic hypertension, diabetes mellitus, and dyslipidemia in relation to body mass index: evaluation of a Brazilian population. *Revista do Hospital das Clinicas*, 59, 113-118.



© 2023 by the authors; licensee PSRP, Lahore, Pakistan. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license (<http://creativecommons.org/licenses/by/4.0/>).