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Case study

Case study on hypertensive crisis in a 27-year-old male patient without any prior history of hypertension

Gokula Priya M[*1], Deepika Vishwanathan[1], Sendilkumar B[2], Tamilchudar R[3], Muthamil Selvan S[4]

[1] Department of Pharmacology, School of Allied Health Sciences, VMRF (DU) Salem, Tamil Nadu, India
[2] Dean and Director, School of Allied Health Sciences, VMRF (DU) Salem, Tamil Nadu, India
[3] Department of Public Health, School of Allied Health Sciences, VMRF (DU) Salem, Tamil Nadu, India
[4] Department of Anesthesia Technology, School of Allied Health Sciences, VMRF (DU) Salem, Tamil Nadu, India

Corresponding author: Gokula Priya M, ✉ gokulapriya17111999@gmail.com, **Orcid Id**: https://orcid.org/0009-0008-6541-8084

Department of Pharmacology, School of Allied Health Sciences, VMRF (DU) Salem, Tamil Nadu, India

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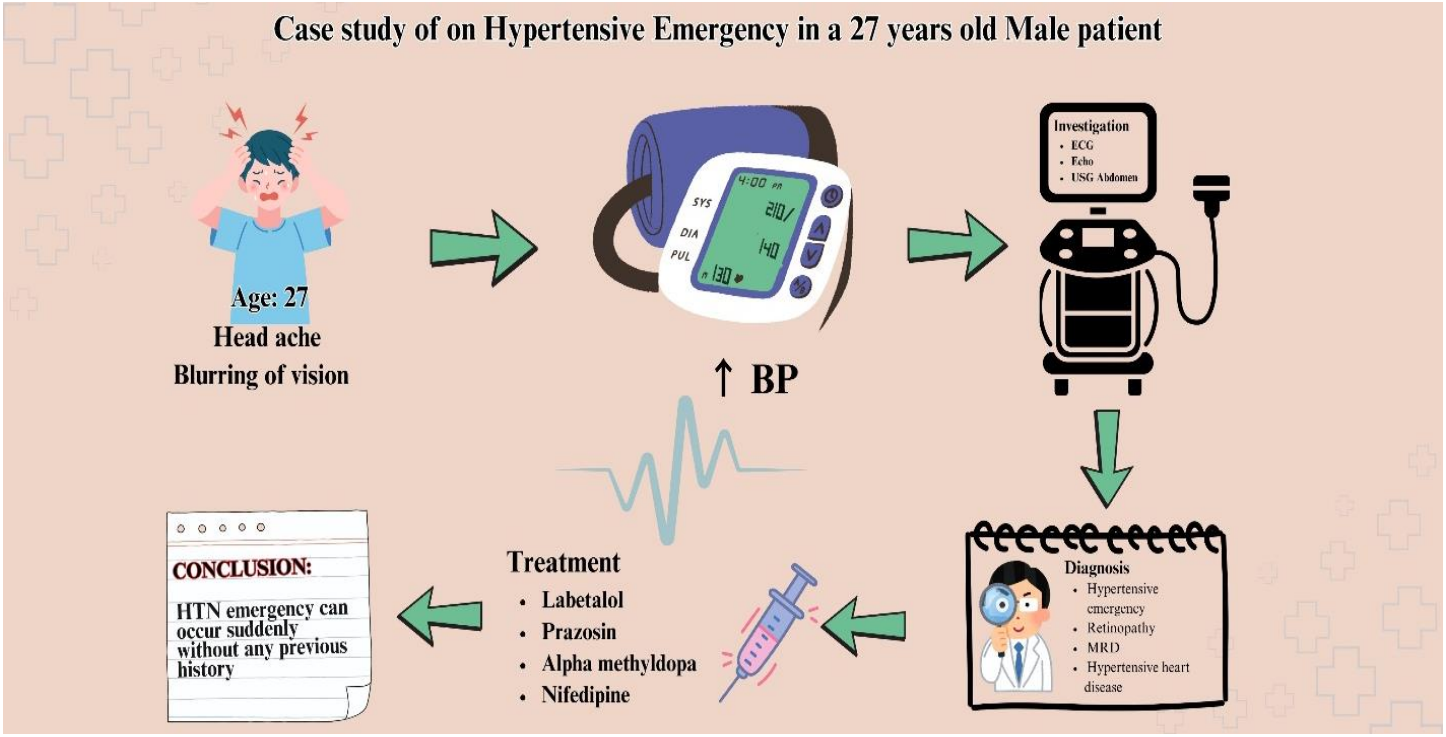
ABSTRACT

Hypertensive emergency is the severe increase in blood pressure that can cause end organ damage. The organs are usually brain, heart, eyes and kidney. Retinal blood vessels are harmed by persistent hypertension, which causes a number of anatomical abnormalities. Blindness or visual impairment may ensue if treatment is not received. These symptoms can be subtle and may not necessarily cause significant concern. However, the condition progresses, more advanced symptoms can develop including vision loss, distorted vision, retinal detachment and vitreous haemorrhage. Hypertensive crisis may also damage kidney.



A 27 years old male patient with a past history of chronic hepatitis B suddenly developed blurring of vision and headache with elevated blood pressure of about 210/140 mmHg. Patient then was treated with injection labetalol. Labetalol effectively manages acute hypertensive crisis. Addition of other antihypertensives and diuretics paves way for the better management of patient's condition. The use of combination of antihypertensives is better in managing hypertension than the use of single agent. Patient was given discharge medications for 20 days. All the drugs given was effective in treating the patient's condition. Hypertensive emergency can also occur all of a sudden without any past history. Effective management strategies should be employed to treat the condition or else it may lead to life threatening impacts on patient's quality of life.

Keywords: Hypertensive emergency, Labetalol, Nifedipine, Calcium channel blocker, Furosemide, Alpha methyl dopa.

INTRODUCTION

A hypertension emergency also called a hypertension crisis, is a severe increase in BP that can cause severe damage to brain, heart, eyes and kidney. The primary symptoms of hypertension emergency may include severe headache, confusion or disorientation, vision changes or blindness, chest pain or shortness of breath and seizures or coma. The European guidelines for hypertension states that adults suspected with hypertension based on a value ≥140 mm Hg systolic blood pressure and ≥90 mm Hg diastolic BP [1].The major risk factor that significantly contributes to cardiovascular diseases, stroke, and premature morbidity and mortality. Several factors which increase the risk involves obesity, history of hypertension or CHD [2]. The Elevated blood pressure can develop serious condition called hypertensive retinopathy, a condition that harms the retina, the light sensitive tissue at the back of the eyes. Retinal blood vessels are harmed by persistent hypertension, which causes a number of anatomical abnormalities. Blindness or visual impairment may ensue if treatment is not received [3]. Furthermore, vascular disorders and death are frequently predicted or indicated by hypertensive retinopathy. Hypertensive retinopathy's pathogenesis involves three stages of histological destruction. In vasoconstrictive phase causes localized vasospasm and vasoconstriction of retinal arterioles through auto regulatory mechanisms to ensure adequate blood flow. Sclerotic Phase leads to structural alterations in vessel walls, such as endothelial damage, intimal thickening, media layer hyperplasia, and hyaline degeneration. In third phase or Exudative Phase, severe systemic hypertension is characterized by a breakdown of the blood-retina barrier. This disturbance causes blood leakage (which appears as flame-shaped or dot-blot haemorrhages in the superficial and inner retinal layers, respectively), as well as lipid exudates that form hard deposits [4]. Cotton-wool like patches indicates ischemia in the nerve fibre layer of retina. Extreme and persistent hypertension can lead to malignant hypertension, which is typified by high intracranial pressure. This disorder is a serious consequence of hypertensive retinopathy that can cause optic nerve ischemia and optic disc swelling (papilledema). The symptoms of HR can vary depending on the stages, person may experience blurred vision, double vision, floaters or flashes of light [5]. These symptoms can be subtle and may not necessarily cause significant concern. However, the condition progresses, more advanced symptoms can develop including vision loss, distorted vision, retinal detachment and vitreous haemorrhage [6].There may be a connection between retinal microvascular symptoms and reduced cognitive performance, according to prior research, which could put people with HR at psychological risk [7]. A comprehensive examination of the retina is essential to reduce the appearance of creases, facilitating a more precise diagnosis through fundoscopy. It is imperative that the ophthalmologist utilizes a specialized instrument to inspect the posterior segment of the eye. [8, 9, 10]This examination may reveal signs such as arteriolar narrowing, haemorrhages, exudates, and swelling of the optic nerve. The objective of this assessment is to evaluate the extent and severity of hypertensive retinal injury, enabling tailored treatment strategies for each individual case [11, 12].

Presentation of Case

A 27 years old male patient who was apparently normal before 4 days. Then he had developed complaints of headache, blurring of vision of left eye. Then he was admitted in the emergency ward and diagnosed as Hypertensive emergency and elevated renal parameters. The patient had a past history of chronic hepatitis B for 4 years but was not on any treatment. The patient was conscious, oriented and afebrile. The patient undergone general examination and systemic examination. The patient's body temperature was slightly elevated, pulse was 84b/m, Respiratory rate was 20cycles/min and SpO2 was 98%. The Blood Pressure of the patient has been mentioned in Table 1.The systemic examinations of the patient have been mentioned in Table 2.Then investigations have been done like CT Brain, USG Abdomen, ECG, ECHO. Echocardiographic report states that left ventricular ejection fraction (LVEF) is 60% and shows the impression of Left Ventricular Hypertrophy and Hypertensive. ECG findings show sinus tachycardia. The findings in USG Abdomen are bilateral grade II mild renal disease. CT Brain shows hyper dense lesion in transverse region. All the laboratory parameters of the patient have been mentioned in Table 3. The patient was diagnosed with Hypertensive Emergency/Grade III Hypertensive Retinopathy/Grade II MRD/ HTN-heart disease. Initially the patient was managed with Inj. Labetalol, Inj. Furosemide, Tab. Nifedipine, Tab. Prazosin, Tab. NAHCO3, Tab. CaCO3 was given to the patient. The patient was advised to follow salt

restricted diet. After 3 days Inj. Labetalol was changed to Tab. Labetalol. On the 4th day Tab. Alpha Methyldopa was added. The complete treatment plan has been mentioned in Table 4. After the treatment the patient's condition improved. The patient was discharged and given medications. The discharge medications are mentioned in Table 5. The patient was advised for the follow-up after 7 days to observe the condition and for further examination.

Table 1: Blood Pressure

DAY	OBSERVED BP (mmHg)	NORMAL BP (mmHg)
1	210/140	120/80
2	140/90	120/80
3	190/110	120/80
4	140/90	120/80
5	110/80	120/80
6	100/70	120/80

Table 2: Systemic Examination

Systemic Examination	Observation
CVS	S1, S2 Heard, No Murmur
RS	B/L Air entry, no added sounds
ABDOMEN	Soft non tender
CNS	Moves all 4 limbs

Table 3: Blood Parameters

Parameter	Observed Values	Reference Values
Red blood cells	3.79 million cells	3.5 to 5.5 million cells/µL
Hemoglobin	10.5g/dl	13 to 18 g/dL
Total count	6200 cells/cu.mm	4000 to 11000 cells/cu/mm
Platelet	193000 cells	150000 to 450000/mcL
Urea	42mg/dl	19-44mg/dl
Creatinine	1.5 mg/dl	0.74 to 1.5mg/dl
Na^+	138 mEq/L	135 to 145 mEq/L
K^+	3.5 mEq/L	3.5 to 5.2 mEq/L
Cl^-	105 mEq/L	96 to 106 mEq/L
Random blood sugar (RBS)	101 mg/dl	<200 mg/dl
FBS	72 mg/dl	70-100mg/dl
PPBS	149 mg/dl	< 200 mg/dl
SGOT	27 U/L	8-45 U/L
SGPT	22 U/L	7-56 U/L
Total protein	6.1 g/dL	6.0 -8.3g/dL
Total bilirubin	1 mg/dl	0.1 to1.2mg/dl
ALP	99 IU/L	44 TO 147 IU/L
Total cholesterol	123 mg/dl	< 200mg/dl
Triglycerides	130 mg/dl	<150mg/dl
LDL	46 mg/dl	<110mg/dl
HDL	51 mg/dl	>45mg/dl
VLDL	26 mg/dl	2to 30mg/dl

Table 5: Drug Chart

Drug name	Dose	Route	Frequency	Start	Stop
Inj. Labetalol	20 mg	IV	STAT	Day 1	Day2
T. Nifedipine	100 mg	Oral	2 TDS	Day 1	Day 7
T. Paracetamol	500 mg	Oral	TDS	Day 1	Day 3
T. CaCo3	500 mg	Oral	2 TDS	Day 1	Day 7
T. NaHCo3	500 mg	Oral	2 TDS	Day 1	Day 7
T. Atorvastatin	10 mg	Oral	OD	Day 1	Day 7
T. Prazosin	2.5 mg	Oral	BD	Day 1	Day 7
Inj. Furosemide	20 mg	IV	BD	Day 1	Day 3
T. Labetalol	100 mg	Oral	TDS	Day 3	Day 7
T. Methyl dopa	250 mg	Oral	TDS	Day 3	Day 7

Table 6: Discharge Medications

Drug Name	Dose	Route	Frequency
T. Labetalol	100 mg	Oral	1-1-1
T. Nifedipine	100 mg	Oral	2-2-2
T. Prazosin	2.5 mg	Oral	0-0-1
T. NaHCo3	500 mg	Oral	1-1-1
T. CaCo3	500 mg	Oral	1-0-1
T. Atorvastatin	10 mg	Oral	0-0-1

CONCLUSION

Hypertensive emergency was diagnosed based on the elevated blood pressure (210/140 mmHg). Patient was presented with blurred vision. Due to this sudden hypertensive emergency patient had a renal damage. It was diagnosed as grade II mild renal disease based on the USG abdomen results. Echo shows left ventricular hypertrophy and left atrium wall dilated. It seems to be like hypertension of idiopathic origin. Initially the patient was given Inj. Labetalol 20 mg IV immediately. Then after that the patient was reassessed. Labetalol is an alpha-beta adrenergic blocker. Labetalol is reserved for the acute management of hypertensive crisis. Then Inj. Furosemide 20 mg Iv was given. Furosemide belongs to the class of loop diuretics. Furosemide treats high blood pressure. It also reduces swelling related to heart and kidney disease. The patient was given T. Nifedipine 100mg 2 TDS. The calcium channel blocker, nifedipine, is an effective antihypertensive agent for the treatment of hypertensive urgencies and emergencies. It produces a prompt, safe, predictable, and consistent reduction in systemic arterial pressure with minimal adverse effects. Nifedipine is a simple, effective, and safe alternative drug for managing hypertensive emergencies, especially when continuous monitoring of the patient cannot be guaranteed. As the patient's body temperature was slightly elevated paracetamol was given. Tab. Atorvastatin 10mg OD was given. A study stated that combining HMG CoA reductase inhibitor with antihypertensive drugs results in better BP lowering compared to monotherapy in hypertension. This effect of statins on lowering BP is due to vasodilation. Tab. Prazosin 2.5 mg was given as BD. It is an alpha-adrenergic antagonist. Prazosin effectively treats mild or severe hypertension as a single agent, or as a combination with another antihypertensive and/ or a diuretic. It works by relaxing the blood vessels. Prazosin has the risk of orthostatic hypotension, hence should be started with low dose. Use of CaCo3 and NaHCo3 supplements slows the rate of progression of renal failure. Inj. Labetalol has been changed to tablet as the severity decreases. This is the conversion from injection to oral form. Tab. Methyldopa 250 mg oral was given. It is a centrally acting sympatholytic. The best indication for the use of methyldopa appeared to be renal insufficiency in hypertensive patients. A meta- analysis states that methyldopa reduces systolic/diastolic blood pressure by approximately 13/8 mmHg. All the drugs given were effectively used for controlling hypertension and patient improved from the condition. The patient was further advised to do renal Doppler for further assessments.

CONCLUSION

From this case study, we can observe that the patient received effective treatment and the patient's condition has improved. Inj. Labetalol has lowered the patient's blood pressure to a greater extent. Combination therapy of diuretic and antihypertensive has significantly reduced the blood pressure. The patient was discharged with medications and advised to continue the medication. The patient was given T. Labetalol 100mg TDS, T. Nifedipine 100mg 2TDS, T. Prazosin 2.5mg OD, T. Atorvastatin 10mg OD, T. NaHCo3 500mg TDS, T. CaCo3 500mg BD for 20 days. Then patient was advised to do renal doppler. Day by day the patient's blood pressure had fall from 210/140 mmHg to 110/80 mmHg. As the patient had a past history of Chronic hepatitis B, screened for HbcAg and it turned to be negative. It is possible to experience a hypertensive crisis without a previous history of hypertension. This may be even unnoticed by the patient priorly. It would have been asymptomatic. Due to the effective treatment options the patient's condition has improved and severity has been decreased. Routine checkups should be done by the patient.

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