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Retinopathy with renal failure

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ABSTRACT

About 1% of people with hypertension develops hypertensive crisis over some point of life period. Report a case on malignant hypertension with grade II retinopathy and renal failure. A patient with a known case of hypertension for past 5 years was admitted with complaints of headache, orthopnoea, difficulty in breathing and an elevated BP of 220/110 mm Hg and was diagnosed to have malignant hypertension. The patient was referred to ophthalmologist on the second day. The fundus examination showed grade II hypertensive retinopathy. On laboratory investigation serum creatinine and urea level was elevated, urine analysis showed moderate albuminuria, with decreased Glomerular filtration rate and patient was diagnosed to have stage 3 Chronic kidney disease. The patient was treated with a triple combination of Angiotensin Receptor Blocker (ARB) + Calcium channel blocker (CCB) + β blocker, diuretics, centrally acting antihypertensive, statin and antiplatelet agent. Blood pressure was subsided followed by gradual improvement in visual acuity.

Key words: Malignant hypertension, Retinopathy, Chronic renal failure.

Introduction

Hypertension is defined as persistent elevation of arterial blood pressure.[1]It is considered as a major cause of mortality worldwide. Acute hypertension can lead to accelerated or malignant hypertension.[2]It occurs in about 1% of people with high blood pressure.[3]Malignant hypertension is defined as extremely high blood pressure (above 180/120 mmHg) which develops rapidly and can lead to targeted organ damage.[4]The systems primarily involved include central nervous system (brain and eyes), cardiovascular system, and renal system.[5,6] Patients diagnosed with malignant hypertension have severe hypertension with bilateral retinal haemorrhage and exudates (Figure No.1).[2,7]Uncontrolled high blood pressure leads to increase in intra glomerular pressure causing impairment of glomerular filtration which in turn lead to abnormal protein levels in urine(proteinuria) (Figure No.2).[8]

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Case Report

A 57 year old male patient was admitted in a tertiary care hospital in general medicine department with complaints of headache for past 10 days, not associated with vomiting episodes. He was also presented with orthopnoea and difficulty in breathing (grade III). Previous medical history shows that he has a known case of hypertension and was on regular medication of Amlodipine and Atenolol for past 5 years. On admission, blood pressure was found to be 220/110mmHg. Physician advised to monitor blood pressure every 6th hourly on daily basis (given in table 1) and was diagnosed with Malignant hypertension.

Chest x-ray revealed cardiomegaly with increased bronchovascular markings and prominent aortic knuckle. ECG showed sinus bradycardia. ECHO cardiogram was done with findings of interventricular septal hypertrophy, grade I LV diastolic dysfunction and trivial mitral regurgitation. Ejection fraction was found to be 65%.Vital signs of temperature, pulse and respiratory rate was found to be normal. Other investigations are shown in table 2 and 3.

The patient was referred to ophthalmologist. On fundus analysis basic examination findings were: both eye disc was normal and showed grade II sclerosis of retinal arterioles, small retinal haemorrhages and arteriolar narrowing. Impression was grade II hypertensive retinopathy. USG abdomen showed increased renal cortical echoes. On laboratory investigation blood urea, serum creatinine levels were found to be elevated.Urinalysis showed presence of trace amount of albumin. Based on these examinations and GFR (shown in table 4) values, it was diagnosed as Stage 3 Chronic kidney disease.

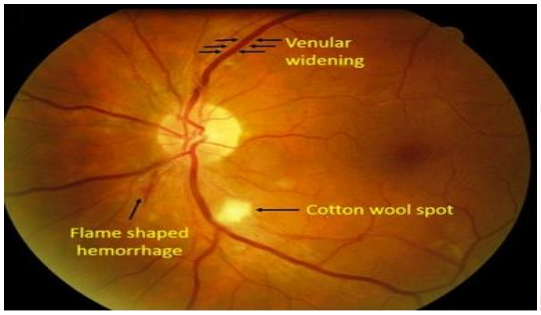

Fig1: Hypertensive retinopathy[10]

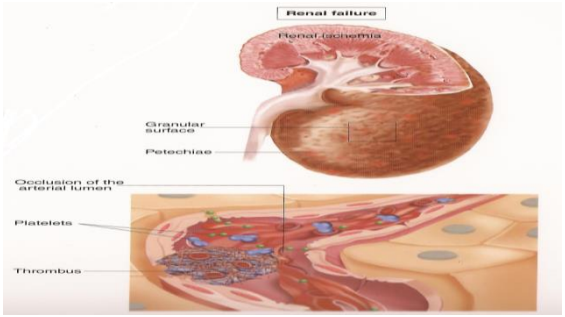

Fig 2:Hypertensive renal damage[11]

Daily blood pressure chart

Table 1: Blood Pressure Chart

DAILY BLOOD PRESSURE CHART								
Date & Time	25/1	26/1	27/1	28/1	29/1	30/1	31/1	1/2
8.00AM	190/116	180/110	174/100	200/110	170/100	140/100	180/110	140/90
2.00PM	180/100	180/108	172/100	180/110	160/100	140/110	140/100	140/100
8.00PM	180/106	180/106	180/110	180/100	170/100	160/100	160/100	140/100

Table 2: Laboratory Investigation Chart

LABORATORY INVESTIGATIONS		
SL.No.	**Lab test**	**Patient value**
1	ESR	18mm/hr
2	WBC	10.7×10^9/L
3	Hgb	13.9g/dl
4	HCT	40.2%
5	RBC	4.69×10^{12}/L
6	MCV	85.9fL
7	MCH	29.6pg
8	MCHC	34.5g/dl
9	PLT	246×10^9/L
10	L%	22.3%
11	M%	8.1%
12	G%	69.6%
13	RBS	84 mg/dl

Urinalysis

Colour: pale yellow Pus cells: 3-5/hpf
Reaction: acidic RBC: 0-1/hpf
Albumin: (+) Epithelial cells: 1-2/hpf
Sugar: nil Cast/crystals: nil

Fig 1:Urinalysis

Table 4: Kidney Function Test

KIDNEY FUNCTION TEST				
SL.No.	**Investigation**	23/1	26/1	31/1
1	S. Creatinine	2.8mg/dl	3.9mg/dl	2.9 mg/dl
2	B. Urea	54mg/dl	87mg/dl	65mg/dl
3	GFR	33.75 ml/min	24.23 ml/min	32.6 ml/min

Table 5: Input Output Chart

INPUT/OUTPUT CHART								
Date	25/1	26/1	27/1	28/1	29/1	30/1	31/1	1/2
Input (ml)	1100	1750	1200	1400	1400	1200	1400	1300
Output (ml)	1050	2750	1700	1300	1300	1100	1350	1500

Treatment given to the patient

The patient was on Amlodipine and Atenolol for past 5 years. Then the patient referredto a private hospital before one week with complaints of giddiness and vomiting and he was prescribed with T.Losartan, T.Metoprolol, and T.Alprazolam. On admission the patient was started with a triple combination of Metoprolol+ Clinidipine+Telmisartan, InjTorsemide, Tablet Moxonidine, Tablet Atorvastatin+Clopidogrel and Tablet Paracetamol. On fourth day serum creatinine was found to be elevated. It was identified that Telmisartan was the cause thereafter, it was discontinued. On discharge patient was prescribed with T.Moxonidine, T.Clonazepam, T.Atorvastatin+Clopidogrel, T.Clinidipine, T.Paracetamol, T.Torsemide, Capsule Alpha D3.

Discussion

The patient was on Amlodipine +Atenolol for past 5years. One week before getting admitted on this hospital, he referred to a private hospital with complaints of giddiness and vomiting .He was prescribed with T.Losartan, T.Metoprolol, and T.Alprazolam. But the past medication taken by the patient was not effective in lowering the blood pressure.Blood pressure control was attained only after the triple combination of Telmisartan (Angiotensin Receptor Blocker) +Metoprolol (βBlocker)+Clinidipine (Calcium Channel Blocker) along with centrally acting antihypertensiveMoxonidine and Injection Torsemide was given. The patient was diagnosed as Stage 3 Chronic Kidney Disease with a creatinine level of 2.8mg/dl (GFR-33.7ml/min). After the patient was started with triple therapy, the serum creatinine level was elevated to 3.9mg/dl. During the ward rounds, Clinical Pharmacist found that the serum creatinine was further elevated due to Telmisartan containing triple combination. Some evidence from the previous studies suggests that the Telmisartan can cause increase in serum creatinine.[9] Hence, Telmisartan was discontinued and prescription was changed to double combination of Metoprolol+Clinidipine. Blood pressure was controlled with the medications. Patient was prescribed with atorvastatin and clopidogrel as per standard treatment guidelines for management of cardiovascular risk in CKD.[9] But in this case patient's bleeding time and clotting time was not checked and lipid profile was not done.

Abbreviations

- BP:Blood Pressure
- ARB:Angiotensin Receptor Blocker
- CCB:Calcium Channel Blocker
- ECG:Electro Cardio Gram
- ECHO:Echocardiogram
- LV:Left Ventricle
- USG:Ultra Sono Gram
- GFR:Glomerular Filtration Rate
- CKD:Chronic Kidney Disease
- ACE:Angiotensin Converting Enzyme

Conclusion

In this case, we found that Telmisartan can lead to increase in serum creatinine in CKD patients. So we insist the health care providers that serum creatinine should be closely monitored while on therapy with ARB/ACE inhibitors in CKD patients. According to the patients

We suggest the importance of checking relevant laboratory parameters. Drugs have to be given in accordance with the diagnosis and laboratory values. And it is necessary to have routine check-up of laboratory values to assess the impact of certain drugs on the relevant parameters.

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