

Posterior reversible encephalopathy syndrome-an under recognized manifestation of Chronic Kidney Disease

Vivek B. Kute, Hargovind L. Trivedi, Pankaj R. Shah, Manoj R. Gumber, Himanshu V. Patel, Aruna V. Vanikar¹

Abstract

First Report of the Indian Chronic Kidney Disease (CKD) Registry showed that patient with CKD in India more frequently presented in Stage V. Many patients have uncontrolled hypertension and uremia due to noncompliance or non affordability of renal replacement therapy which can lead to complications such as posterior reversible encephalopathy syndrome (PRES). A 17-year-old female had end stage renal disease (ESRD) due to malignant hypertension. She developed headaches, altered consciousness, visual disturbances and seizures. A non contrast brain computed tomography revealed bilateral symmetrical white matter hypodensity in parietal, temporal, and occipital region suggesting PRES. Intravenous lorazepam was given for acute control of seizure and she required phenytoin, valproic acid, levetiracetam to control seizures. She was started on more frequent hemodialysis. She required five types of antihypertensive drugs to control blood pressure. We report successful renal transplantation (RTx) in a CKD patient with PRES. Constraints in operating an effective maintenance dialysis program leave RTx as the only viable option for ESRD patients in our country to prevent complications like PRES associated with uremia and uncontrolled hypertension

Keywords: Chronic kidney disease, hypertension, posterior reversible encephalopathy syndrome

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Introduction

Chronic Kidney Disease (CKD) burden is increasing worldwide. In developing countries like India, limited financial resources and lack of infrastructure put a severe strain on existing health policies in the light of the increasing burden of CKD.^[1] First Report of the Indian CKD Registry showed that patient with CKD in India more frequently presented in Stage V.^[2] Many patients have uncontrolled hypertension, uremia and

noncompliance or non affordability of renal replacement therapy (RRT) which can lead to complications like posterior reversible encephalopathy syndrome (PRES).^[3-8] It can be first manifestation of CKD, develops after discontinuation of antihypertensive therapy and due to severe uremia.^[3-7] It could be induced by cyclosporine use in a patient with kidney disease or occurring after blood transfusion in a patient with CKD.^[8,9] Recurrent and atypical posterior reversible encephalopathy syndrome in a child with peritoneal dialysis has been reported.^[10] We report successful renal transplantation (RTx) in a CKD patient with PRES.

Case Report

A 17-year-old female was admitted for living donor (LD) RTx. Her earlier medical history included renal biopsy proven malignant hypertension, and end stage renal disease (ESRD). She was on maximum dosage

From:

Department of Nephrology and Clinical Transplantation, Institute of Kidney Diseases and Research Center, Dr. HL Trivedi Institute of Transplantation Sciences, [IKDRC-ITS] Ahmedabad, ¹Pathology, Laboratory Medicine, Transfusion Services and Immunohematology, IKDRC-ITS, Ahmedabad, India

Correspondence:

Dr. Vivek B. Kute, Department of Nephrology and Clinical Transplantation, Institute Of Kidney Diseases and Research Centre, Dr. HL Trivedi Institute of Transplantation Sciences [IKDRC-ITS], Civil Hospital Campus, Asarwa, Ahmedabad - 380 016, Gujarat, India.
E-mail: drvivekkute@rediffmail.com

of three types of antihypertensive drugs [nifedipine, clonidine, metoprolol] to control blood pressure. She was on regular hemodialysis of 4 hrs duration two to three times per week since three months.

She developed headaches, altered consciousness, visual disturbances and seizures. A seizure was the presenting manifestation. Seizures were generalized tonic clonic leading to status epilepticus. It was succeeded by visual blurring. The headache was typically constant, nonlocalized, moderate to severe, and unresponsive to analgesia. Altered consciousness ranged from mild somnolence to confusion and agitation, progressing to stupor/coma. The deep tendon reflexes were brisk with Babinski signs present. The patient had weakness and incoordination of the limbs. No other focal neurologic deficits were present. Physical assessment revealed blood pressure of 210/110 mmHg, temperature 38.3°C, respiratory rate of 30 breaths per minute, heart rate of 100 beats per minute.

Arterial blood gas showed PaO₂ 137 mm of Hg, PCO₂ 43 mm of Hg, pH 7.37 and bicarbonate 24.6 mmol/L, potassium 4.3 mmol/L, sodium 143 mmol/L, chloride 103 mmol/L, anion gap 19 mmol/L, calcium 1.12 mmol/L, glucose 108 mg/dl, lactic acid 3.4 mmol/L.

The fundoscopic examination revealed hypertensive retinopathy without papilledema. A non contrast brain computed tomography revealed bilateral symmetrical white matter hypodensity in the parietal, temporal, and occipital regions suggesting PRES [Figure 1]. No other abnormalities were noted. There was no history of cytotoxic immunosuppressive therapy or eclampsia. Laboratory investigations revealed hemoglobin, 9.2 gm/L; total white cell count, 5.65 × 10³/μl (differential count: 55% neutrophils, 42% lymphocytes, 2% monocytes, and 1% eosinophils); platelet count, 1.5 × 10⁵/μl; serum creatinine (SCr), 7.2 mg/dl; blood urea, 92 mg/dL; serum calcium, 8.7 mg/dl; serum phosphorus, 5.7 mg/dl; serum magnesium, 2 mg/l; alanine aminotransferase,

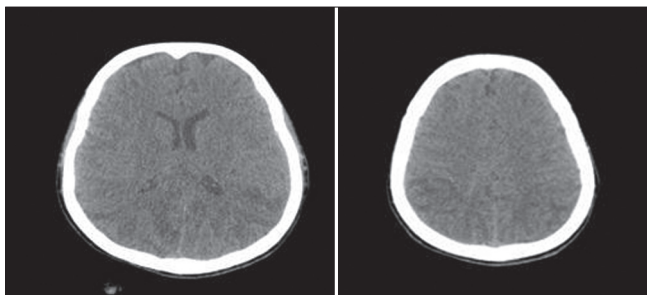


Figure 1: A non contrast brain computed tomography shows presence of hypodensities in cortical and subcortical white matter at bilateral parieto-occipital region at presentation

34 units/l (normal range: 0-40 units/l); aspartate aminotransferase, 30 units/l (normal range: 5-34 units/l); serum bilirubin, 1 mg/dl; and serum albumin, 3.8 gm/dl. Multiple blood, urine, and sputum cultures were sterile. With control of hypertension, the patient improved dramatically.

Intravenous lorazepam was given for acute control of seizures and she went on to require phenytoin, valproic acid and levetiracetam. She was started on more frequent HD. She required five different types of antihypertensive drugs to control blood pressure. Initially she was started on intravenous nitroprusside and nitroglycerine to rapidly control blood pressure. Cardiac monitoring, frequent measurement of blood pressure, and pulse oximetry were instituted. She recovered clinically within one week. The resolution of findings on neuroimaging occurred gradually. Subsequently, she underwent successful LD RTx without recurrence of PRES.

Discussion

RTx is the best treatment for ESRD. Constraints in operating an effective maintenance dialysis program leave RTx as the only viable option for ESRD patients in our country. We believe that RTx is viable option to prevent complications like PRES associated with uremia and uncontrolled hypertension. Early control of hypertension and uremia and compliance with RRT are the measures to prevent PRES in patients of ESRD.

PRES is a neurologic syndrome defined by clinical and radiologic features. The typical clinical syndrome includes headache, confusion, visual symptoms, and seizures.^[3] The typical MRI findings are consistent with vasogenic edema and are predominantly localized to the posterior cerebral hemispheres. DWI can be helpful in distinguishing PRES from stroke. PRES most often occurs in the setting of hypertensive crisis, preeclampsia, or with cytotoxic immunosuppressive therapy; however, many other clinical settings are described.^[3-10]

Lowering of blood pressure in all patients is recommended.^[5] An easily titratable parenteral agent such as nifedipine or labetalol is suggested.^[3] Even patients with seemingly normal blood pressure benefit from blood pressure lowering as their baseline blood pressure may be much lower. Withdrawing or lowering the dose of the offending cytotoxic agent, permanently if possible is also suggested.^[9] When another immunosuppressive agent is substituted, patients must be followed closely for recurrence of PRES. The patients who have seizures should be treated with antiepileptic drugs. The risk of

late recurrence or epilepsy after uncomplicated PRES appears low. The anticonvulsant should be discontinued after the resolution of symptoms and neuroimaging abnormalities.^[3] In the peripartum setting, patients with PRES should be treated as for preeclampsia or eclampsia. Most patients recover within two weeks. A small number have residual neurologic deficits resulting from secondary cerebral infarction or hemorrhage; some patients die as a result of increased intracranial pressure or as a complication of the underlying condition. MRI findings can be helpful in identifying patients with worse prognosis.

Conclusion

PRES is a syndrome that must be suspected in every patient presenting with neurologic symptoms in the course of CKD with uremia and hypertension. PRES should be promptly recognized, since it is usually reversible. Treating clinicians should have a high clinical suspicion in the appropriate settings (uncontrolled hypertension, uremia), recognize the neurologic syndrome, and evaluate for PRES with brain imaging. We believe that RTx is viable option to prevent complications like PRES associated with uremia and uncontrolled hypertension in ESRD patients.

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