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POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME (PRES) IN AN 11-YEAR-OLD CHILD SECONDARY TO HYPERTENSIVE ENCEPHALOPATHY DUE TO SUSPECTED POST-STREPTOCOCCAL GLOMERULONEPHRITIS: A CASE REPORT

Emergency Medicine

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ABSTRACT

Posterior Reversible Encephalopathy Syndrome (PRES) is a clinico-radiological syndrome characterized by acute neurological symptoms such as seizures, altered mental status, headache, and visual disturbances associated with vasogenic cerebral edema on neuroimaging. Although commonly reported in adults, PRES is relatively rare in children and is frequently associated with hypertension, renal diseases, and immunosuppressive therapy. Early recognition is essential as prompt management of the underlying cause can lead to complete neurological recovery. We report a case of an 11-year-old boy presenting to the emergency department with generalized tonic-clonic seizures and altered sensorium, subsequently diagnosed with PRES secondary to hypertensive encephalopathy due to suspected post-streptococcal glomerulonephritis (PSGN). Early seizure control and blood pressure management resulted in favorable clinical recovery.

KEYWORDS

Posterior reversible encephalopathy syndrome, Pediatric PRES, Hypertensive encephalopathy, Post-streptococcal glomerulonephritis, Emergency medicine.

INTRODUCTION

Posterior Reversible Encephalopathy Syndrome (PRES) is a neurological disorder first described by Hinchey et al. in 1996 and characterized by reversible vasogenic edema predominantly affecting the parieto-occipital regions of the brain[1]. It typically presents with seizures, altered sensorium, visual disturbances, and headache[2].

The syndrome occurs due to disruption of cerebral autoregulation leading to endothelial dysfunction and leakage of fluid into the interstitial space of the brain, particularly in the posterior circulation[3]. Although more frequently reported in adults, PRES in children is uncommon and is often associated with renal disorders, hypertension, autoimmune diseases, and cytotoxic therapies [4].

Post-streptococcal glomerulonephritis (PSGN) is a well-recognized cause of acute hypertension in children and may precipitate hypertensive encephalopathy and PRES [5]. Prompt identification and management are crucial, as most patients recover completely if treated early.

We present a rare pediatric case of PRES secondary to hypertensive encephalopathy due to suspected PSGN presenting with seizures in the emergency department.

CASE REPORT

An 11-year-old boy was brought to the emergency department with generalized tonic-clonic seizures. On arrival, the patient was immediately placed in the left lateral position, oxygen was administered through a non-rebreather mask at 15 L/min, and intravenous access was secured. Inj. Lorazepam 2 mg IV was administered, following which the seizure activity terminated. A loading dose of intravenous phenytoin was subsequently administered.

History

The patient was apparently asymptomatic 10 days prior to presentation, when he developed:

- Fever with chills
- Sore throat
- Loose stools (4–5 episodes, watery, non-bloody)

Over the following days, he developed facial puffiness and bilateral pedal edema. On the day of presentation, he complained of headache followed by an episode of abnormal movements involving all limbs, associated with up-rolling of eyes, frothing from mouth, and post-ictal confusion.

There was no prior history of seizures, chronic illness, or drug intake. Immunization status was up to date.

PRIMARY SURVEY IN EMERGENCY DEPARTMENT

Airway: Patient producing incomprehensible words, airway maintained

Breathing:
RR – 20/min
SpO_2 – 98% on room air

Circulation:
HR – 102 bpm
BP – 152/92 mmHg

Disability:
GCS – 10/15 (E2V3M5)
Pupils – bilaterally equal and reactive
Random blood glucose – 128 mg/dL

Exposure: Hypothermia prevented by applying blankets.

PRIMARY ADJUCTS:

ECG: sinus Rhythm

SECONDARY SURVEY:

On Examination Facial puffiness and bipedal edema present

SYSTEMIC EXAMINATION:

CNS Examination:
Drowsy but arousable, Slurred speech, Tone normal, Power: can not be assessed, Brisk deep tendon
reflexes, Bilateral extensor plantar response.

INITIAL MANAGEMENT IN EMERGENCY DEPARTMENT

Management included:

- Oxygen supplementation via NRBM at 15 L/min
- Intravenous access secured
- Inj. Lorazepam 2 mg IV for seizure control
- Inj. Phenytoin IV loading dose followed by maintenance dose
- Foley catheter insertion for urine output monitoring
- Blood samples sent for laboratory investigations

Continuous monitoring of neurological status and blood pressure was initiated.

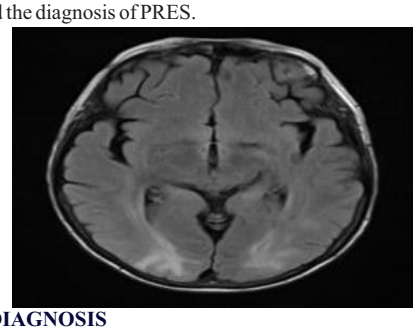
INVESTIGATIONS

Table 1: Laboratory and Radiological Investigations

Investigation	Result	Interpretation
Hemoglobin	Within normal limits	No anemia
Serum Creatinine	1.4 mg/dL	Mild renal impairment
Blood Urea	62 mg/dL	Elevated
ASO Titre	1:1600	Elevated suggesting recent streptococcal infection

Complement C3	9.8 mg/dL	Low, suggestive of PSGN
Serum Electrolytes	Na 138 mEq/L, K 4.0 mEq/L	Normal
Urine Analysis	Proteinuria ++, RBC ++	Glomerular pathology
CT Brain	Bilateral parieto-occipital hypodensities	Suggestive of PRES
MRI Brain	T2/FLAIR hyperintensities in parieto-occipital lobes	Consistent with PRES
EEG	Diffuse slowing	Encephalopathy

The imaging findings of bilateral parieto-occipital vasogenic edema supported the diagnosis of PRES.



FINAL DIAGNOSIS

Posterior Reversible Encephalopathy Syndrome (PRES) secondary to hypertensive encephalopathy due to suspected Post-Streptococcal Glomerulonephritis.

MANAGEMENT AND CLINICAL COURSE

The patient received the following treatment:

Seizure Management

- Inj. Lorazepam 2 mg IV
- Inj. Phenytoin 600 mg IV loading dose
- Maintenance phenytoin 80 mg three times daily

Blood Pressure Control

- Intravenous labetalol for acute blood pressure control
- Oral amlodipine initiated for maintenance therapy

Supportive Treatment

- Strict input–output monitoring
- Salt and fluid restriction
- Intravenous ceftriaxone for suspected infection

Clinical Progress

- Day 2: Patient remained seizure-free
- Day 4: Blood pressure normalized
- Day 8: Patient discharged with oral antihypertensives and nephrology follow-up

The patient showed significant clinical improvement with complete neurological recovery.

DISCUSSION

Posterior Reversible Encephalopathy Syndrome is a neurotoxic state characterized by reversible subcortical vasogenic edema resulting from failure of cerebral autoregulation (2,6). The posterior cerebral circulation is particularly vulnerable due to relatively reduced sympathetic innervation (7).

The most common clinical manifestations include:

- Seizures (60–75%)
- Altered mental status
- Headache
- Visual disturbances (8)

Hypertension is one of the most frequent precipitating factors for PRES, particularly in pediatric patients with renal diseases such as PSGN (9).

In PSGN, immune complex deposition in the glomeruli leads to renal dysfunction, fluid retention, and severe hypertension, which may precipitate hypertensive encephalopathy and cerebral edema (10).

Neuroimaging plays a crucial role in diagnosis. MRI is the gold standard, typically demonstrating T2/FLAIR hyperintensities in parieto-occipital regions, representing vasogenic edema (11).

Management primarily focuses on:

1. Rapid blood pressure control
2. Seizure management
3. Treatment of underlying cause

Most patients show clinical and radiological improvement within days to weeks when managed appropriately (12).

Delayed recognition may lead to complications such as intracranial hemorrhage, cerebral infarction, or permanent neurological deficits (13).

This case highlights the importance of considering PRES in pediatric patients presenting with seizures and hypertension, especially in the context of renal disease.

CONCLUSION

Posterior Reversible Encephalopathy Syndrome is an important neurological emergency that should be suspected in children presenting with seizures, altered sensorium, and acute hypertension. Early neuroimaging and prompt management of blood pressure and seizures are crucial for favorable outcomes. This case underscores the association between hypertensive encephalopathy secondary to post-streptococcal glomerulonephritis and PRES, and emphasizes the reversible nature of the condition when diagnosed early.

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