

Hypertensive Emergency with grade3 Hypertensive Retinopathy and Hypertensive Encephalopathy in 8-Year-Old Male child Secondary to Post-Streptococcal Glomerulonephritis

Dr Gunjan Srivastava (1st Author)

Assistant Professor, Department of Paediatrics, Rama Medical College Hospital & Research Centre,
Hapur , UP -245304
E mail- drgunjansrivastava1@gmail.com
Contact no.- 8527616987

2)Dr Priyanka Rajvanshi (2nd and Corresponding Author)

Senior Resident, Department of Paediatrics, Rama Medical College Hospital & Research Centre,
Hapur , UP -245304
E mail- drrajvanshipriyanka@gmail.com
Contact no-8452815810

3) Dr Mohita Suri(3rd Author)

Assistant Professor, Department of Paediatrics, Rama Medical College Hospital & Research Centre,
Hapur , UP -245304
Email- mohita1812@gmail.com
Contact no- 7895493054

4) Dr R. Narayan(4th Author)

Professor and Head Of Department, Department of Paediatrics, Rama Medical College
Hospital & Research Center, Hapur , UP-245304
Email-drrgh1971@gmail.com
Contact no-8295352890

Abstract

Hypertensive emergencies are rare but life-threatening conditions in children. Post-streptococcal glomerulonephritis (PSGN) remains an important cause of acute glomerular disease in the paediatric population, often complicated by hypertension. Post Streptococcal glomerulonephritis is declining in incidence in the developed world but it continues to pose significant problems with lifelong morbidities in the developing and under developed countries. We report an 8-year-old male presenting withhypertensive emergency with 3 hypertensive retinopathy and hypertensive encephalopathy secondary to PSGN.Prompt recognition and management of the condition were critical in preventing long-term neurological sequelae.

Keywords

Hypertensive emergency, Hypertensive encephalopathy, Post-streptococcal glomerulonephritis, Hypertensive Retinopathy ,Pediatrics

Introduction

Hypertensive emergency in children is defined as severe hypertension with evidence of acute target organ damage involving the brain, kidneys, heart, or eyes.^{1,2,3}The clinical manifestations may include severe headache , confusion , nausea , vomiting , blurring of vision, photophobia and seizures.^{4,5,6}Kidney diseases continue to be a leading cause of hypertensive emergency in paediatric population.^{7,8,9}Post-streptococcal glomerulonephritis(PSGN), a sequela of group A streptococcal infection, remains one of the most common causes ofacute glomerulonephritis worldwide. Although hypertension is a well-recognized feature of PSGN,progression to

hypertensive emergency and encephalopathy is uncommon but potentially fatal. Also development of hypertensive retinopathy secondary to significant hypertension may lead to vision loss. Ophthalmological findings include cotton wool spots, optic disc swelling and macular oedema. Early diagnosis and intervention are essential to reduce morbidity and mortality. Management strategies include prompt management of blood pressure to prevent further retinal damage.

Case Presentation:

This prospective study was carried out between march 2024 and June 2024. An 8-year-old male presented to the paediatric emergency department with complaints of headache which started approximately 15-20 days back. It was localised in frontal region, pulsatile in nature not associated with any aura. Headache was initially low grade but gradually increased in intensity and was very severe at the time of presentation. Patient also had complaints of vomiting, blurring of vision and altered consciousness for one day. There was a history of sore throat 3 weeks prior to the onset of illness. Patient also had periorbital puffiness and decreased urine output for the last 5 days. On examination, the child was drowsy, irritable, and hypertensive with blood pressure of 210/140 mmHg (>99th percentile for age, sex, and height). He had facial puffiness, pedal edema, and basal crepitations on auscultation. Neurological examination revealed altered sensorium (GCS 12/15) without focal deficits. Funduscopy demonstrated bilateral papilledema with flame-shaped hemorrhages. Detailed ophthalmological examination revealed grade 3 hypertensive retinopathy.

Investigations revealed- Hemoglobin: 9.2 g/dL, Total leukocyte count: 4,200/mm³, platelet count-1.4 lakh/qmm, Serum creatinine: 1.74 mg/dL, Blood urea: 66.30 mg/dL, Serum electrolytes: Na-133 mmol/L, K-5.3 mmol/L, Uric acid-8.9 mg/dl, Urinalysis: proteinuria (2+), hematuria (RBC casts present), Complement C3: 1.85 g/L (reduced), Anti-streptolysin O (ASO) titer: elevated (175.2 IU/mL), ANCA-PR3 – 5.4 U/ml (Negative), Ultrasound (Renal Doppler)- Bilateral grade 3 renal parenchymal changes, Normal Renal Artery Doppler parameters, No thrombosis in Renal Vein, Chest X-ray: pulmonary congestion, MRI Brain: Normal scan, Ophthalmological Examination- Hypertensive Retinopathy Grade 3.

Diagnosis

Hypertensive emergency with hypertensive encephalopathy and grade 3 hypertensive retinopathy secondary to post-streptococcal glomerulonephritis.

Management

The child was admitted to the paediatric intensive care unit. Immediate management included:

- 1) Intravenous labetalol infusion to gradually reduce blood pressure (not exceeding 25% reduction in first 8 hours).
- 2) Intravenous furosemide for fluid overload.
- 3) Fluid and salt restriction, with strict monitoring of urine output and electrolytes.
- 4) Supportive care including oxygen and head elevation.
- 5) Ophthalmology opinion was taken for a fundus examination which revealed grade 3 hypertensive retinopathy and treatment was added as per their advice.

Over the next 72 hours, blood pressure was controlled to <95th percentile and neurological symptoms improved. Renal function gradually improved, and oedema subsided. The child was discharged after 10 days on oral antihypertensive (amlodipine) and advised nephrology and ophthalmology follow-up.

Discussion

Paediatric hypertension is mainly due to some secondary cause as compared to adults where most cases are due to primary hypertension.¹⁰ PSGN remains a leading cause of acute nephritis in children aged 5–12 years, particularly in developing countries. Hypertension occurs in 60–80% of cases, but hypertensive emergencies are relatively uncommon. Neurological involvement, including hypertensive encephalopathy is a serious but reversible complication if recognized early. Although severe headache is a common manifestation of hypertensive encephalopathy in adults, our case being of paediatric age group also had significant severe headache.^{11,12} Hypertension may lead to 3 types of ocular injuries; choroidopathy, retinopathy, optic neuropathy.¹³ Hypertensive retinopathy is the result of damage to retinal vessels as a result of increased blood pressure. Medical management of Blood pressure remains the cornerstone for management of hypertensive retinopathy. Our case highlights the importance of:

- ❖ Vigilant monitoring of blood pressure in children with PSGN.
- ❖ Early recognition of neurological symptoms as indicators of hypertensive crisis.
- ❖ Careful BP reduction to avoid ischemic complications.
- ❖ Multidisciplinary management with paediatric nephrology, neurology and ophthalmology team.

Labetalol continues to be the most widely used intravenous infusion in controlling hypertensive emergency.¹⁴ Prognosis in PSGN is generally favourable, and most children recover completely with appropriate care, though follow-up is crucial to monitor for persistent hypertension or chronic kidney disease.

Conclusion

Hypertensive emergency with encephalopathy is a rare but serious complication of post-streptococcal glomerulonephritis in children. Hypertensive retinopathy is less common in paediatric age group but may occur as a result of sustained high blood pressure. Early diagnosis, judicious blood pressure control, and supportive care are key to preventing long-term morbidity. This case underscores the need for heightened awareness among clinicians managing children with acute glomerulonephritis.

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