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Acute Glomerulonephritis in a Pediatric Patient: A Case Study Emphasizing Early Recognition and Management

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Abstract: ***Acute glomerulonephritis (AGN) is a renal condition marked by inflammation of the glomeruli, commonly following streptococcal infections. This case study highlights the clinical presentation, diagnostic evaluation, and management of a 14-year-old male presenting with fever, facial puffiness, and hematuria. Early diagnosis and evidence-based treatment protocols are emphasized as crucial factors in preventing complications such as hypertensive encephalopathy and renal failure.***

Keywords: acute glomerulonephritis, kidney inflammation, facial edema, streptococcal infection, pediatric nephrology, early diagnosis

1. Introduction

Glomerulonephritis is a significant cause of acute kidney injury in children and can present with a wide range of symptoms from mild hematuria to full nephritic syndrome. Early recognition, accurate assessment, and prompt management are essential to improving outcomes. Despite its clinical importance, glomerulonephritis is often underrecognized in primary and emergency care settings.

According to Leung & Chan (2015), post-infectious glomerulonephritis remains one of the most common causes of acute nephritic syndrome in children, often following group A beta-hemolytic streptococcal infections. The case presented below demonstrates the critical role of early diagnosis and initiation of supportive therapy in pediatric glomerulonephritis.

Relevance and Significance:
Acute glomerulonephritis can lead to significant morbidity if not recognized and managed promptly. The classic presentation includes hematuria, facial or periorbital edema, hypertension, and reduced urine output. A thorough clinical history, physical examination, and supportive laboratory findings are key to diagnosis.
The aim of this case study is to increase healthcare providers'(basically nurses) awareness of pediatric glomerulonephritis, reinforce the importance of early recognition, and outline the necessary steps for evidence-based treatment to prevent long-term renal damage.

Objectives:
Upon completion of this case study, the reader should be able to:
- Identify common clinical signs and symptoms of acute glomerulonephritis in pediatric patients
- Understand the diagnostic workup and differentials for nephritic syndrome
- Outline evidence-based management strategies for glomerulonephritis in children

Case Presentation:
A 14-year-old male was admitted to the emergency department of a tertiary care hospital with complaints of fever and chills for one day, and facial and periorbital puffiness for the past three days. The child also reported reddish-colored urine over the past day. There was no history of vomiting, abdominal pain, or recent trauma. However, the mother noted a sore throat episode approximately 10 days earlier that resolved without medication.

Medical History:
There were no prior chronic illnesses or significant family history of renal disease. No history of diabetes, hypertension, or recent medication use was reported. Immunizations were up to date. No known allergies.

Physical Assessment Findings:
On examination, the child appeared alert but mildly lethargic. Vital signs were as follows: temperature 101.8°F (38.8°C), blood pressure 142/92 mmHg, heart rate 98 bpm, respiratory rate 20/min, and oxygen saturation 98% on room air.
- **General:** Mild pallor, facial and periorbital puffiness noted
- **Abdomen:** Soft, non-tender, no hepatospleenomegaly
- **Cardio-respiratory:** Normal heart sounds, clear lungs
- **Neurological:** Oriented, GCS 15/15
- **Skin:** No rashes or petechiae

Laboratory and Diagnostic Testing:
The following investigations were ordered:
- **Urinalysis:** Hematuria, proteinuria (2+), RBC casts seen
- **CBC:** Mild leukocytosis (WBC 13,800/mm³), normal platelet count
- **Renal Function Tests:** Elevated serum creatinine (1.4 mg/dL), elevated BUN (32 mg/dL)
- **ASO Titer:** Elevated at 400 IU/mL
- **C3 Complement:** Decreased
- **Throat Culture:** Positive for Group A Streptococcus
- **Ultrasound of Kidneys:** Mild enlargement of both kidneys, no obstruction

These findings confirmed the diagnosis of acute post-streptococcal glomerulonephritis (APSGN).

Treatment and Management:
The patient was admitted for observation and supportive management. Key interventions included:

- **Fluid restriction** to prevent overload
- **IV antibiotics** (penicillin G) to eradicate streptococcal infection
- **Anti-hypertensives:** Nifedipine administered for elevated blood pressure
- **Monitoring:** Hourly urine output, daily weight, and serum electrolytes monitored
- **Education:** The parents were counseled on the condition, expected course, and follow-up needs

The patient's urine output improved over 48 hours, and facial puffiness began to resolve. Blood pressure normalized with antihypertensive therapy.

Outcome:
The child showed clinical improvement by day four of hospitalization. Hematuria decreased, and renal parameters began trending toward normal. He was discharged with instructions for follow-up with pediatric nephrology and was advised to avoid strenuous activity temporarily. Complete recovery was expected within weeks with proper follow-up.

2. Discussion

Glomerulonephritis in children is most commonly post-infectious in origin, often following streptococcal infections. Recognition of key features—edema, hematuria, and hypertension—can guide clinicians toward prompt diagnosis. Complement levels (particularly C3) and ASO titers are essential in confirming the etiology.

Management is largely supportive, focusing on controlling blood pressure, maintaining fluid and electrolyte balance, and treating any underlying infection. Most children recover fully with timely care, though a small percentage may progress to chronic kidney disease if not properly managed (Alvarado & Schaefer, 2020).

This case emphasizes the importance of timely assessment and team collaboration in managing pediatric nephritic syndromes.

3. Conclusion

Glomerulonephritis must be recognized early in the pediatric population to prevent complications such as hypertensive crisis or renal failure. This case study illustrates how a classic presentation, supported by key investigations, can lead to successful management through evidence-based, supportive care. Increasing awareness among primary care providers, pediatricians, and emergency teams is crucial to reduce the burden of pediatric kidney disease.

References

[1] Leung, A. K. C., & Chan, K. W. (2015). Post-streptococcal glomerulonephritis. *American Family Physician*, 92(8), 738–744.
[2] Smith, R. J., & Appel, G. B. (2016). Glomerular diseases in children. *New England Journal of Medicine*, 374(20), 1941–1952.
[3] Alvarado, A., & Schaefer, F. (2020). Glomerulonephritis in children. *Pediatric Nephrology*, 35(5), 757–768.
[4] National Kidney Foundation. (2023). Glomerulonephritis in children: Overview and management.