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Renal Involvement in Acute Gastroenteritis: A Clinical Study

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ABSTRACT

BACKGROUND:

Background: Acute gastroenteritis is a common gastrointestinal disorder characterized by inflammation of the stomach and intestines, often leading to diarrhea and vomiting. While it primarily affects the digestive system, renal involvement can occur, especially in cases of severe dehydration and electrolyte imbalance.

Objective: This study aims to evaluate the extent of renal involvement in patients with acute gastroenteritis and its correlation with clinical outcomes.

Material and Methods: This cross-sectional study was conducted in the Department of Medicine at a tertiary care hospital over six months. A total of 40 patients aged 18 years and older, diagnosed with acute gastroenteritis based on clinical and laboratory criteria, were included. Renal function was assessed by measuring serum creatinine and blood urea nitrogen (BUN) levels at the time of admission. Patients were categorized based on the severity of their gastroenteritis and hydration status.

Results: Out of 40 patients, 12 (30%) exhibited renal involvement, indicated by elevated serum creatinine and BUN levels. The study found a significant correlation between the severity of gastroenteritis and the degree of renal impairment ($p < 0.05$).

Conclusion: Renal involvement is not uncommon in patients with acute gastroenteritis, especially those with severe dehydration. Regular monitoring of renal function is essential in managing these patients to prevent complications.

Keywords: Acute gastroenteritis, renal involvement, dehydration, serum creatinine and blood urea nitrogen

INTRODUCTION

Acute gastroenteritis is one of the most common gastrointestinal disorders worldwide, characterized by inflammation of the stomach and intestines, leading to symptoms such as diarrhea, vomiting, and abdominal pain (1). It can be caused by various infectious agents, including viruses, bacteria, and parasites, and is often associated with food and water contamination (2). While gastroenteritis primarily affects the digestive system, its systemic effects can have implications for other organs, particularly the kidneys (3).

Renal involvement in acute gastroenteritis can arise from several factors, including dehydration due to excessive fluid loss, electrolyte imbalances, and the direct effects of the infectious agents (4). Severe dehydration, which can result from persistent vomiting and diarrhea, is a significant risk factor for acute kidney injury (AKI) (5). Studies have shown that renal function can be adversely affected during episodes of gastroenteritis, leading to increased serum creatinine and blood urea nitrogen (BUN) levels, which are markers of renal impairment (6).

The importance of monitoring renal function in patients with acute gastroenteritis cannot be overstated, as early detection of renal involvement can guide therapeutic interventions and improve patient outcomes (7). This study aims to assess the extent of renal involvement in patients with acute gastroenteritis and to identify factors associated with renal impairment.

AIM AND OBJECTIVES

Aim:

To study the renal involvement in patients diagnosed with acute gastroenteritis.

Objectives:

1. To evaluate the renal function of patients with acute gastroenteritis by measuring serum creatinine and BUN levels.
2. To assess the correlation between the severity of gastroenteritis and the degree of renal involvement.

MATERIAL AND METHODS

This cross-sectional study was conducted in the Department of Medicine at a tertiary care hospital over a six-month period. A total of 40 patients aged 18 years and older, diagnosed with acute gastroenteritis based on clinical presentation and laboratory findings, were included in the study.

Inclusion Criteria:

- Patients aged ≥18 years
- Clinical diagnosis of acute gastroenteritis with symptoms lasting less than 7 days

Exclusion Criteria:

- Patients with chronic kidney disease
- Patients on nephrotoxic medications
- Patients with other significant comorbidities affecting renal function

At the time of admission, detailed clinical histories were taken, and physical examinations were conducted. Laboratory investigations included serum creatinine and BUN levels, which were analyzed using standard biochemical methods. Patients were categorized based on the severity of their gastroenteritis as mild, moderate, or severe, depending on the clinical presentation and hydration status.

Statistical analysis was performed using SPSS software, with p-values <0.05 considered statistically significant.

RESULTS

Table 1: Clinical Characteristics of Patients with Acute Gastroenteritis

Characteristic	N (%)
Age (mean ± SD)	35.4 ± 12.5
Gender (Male/Female)	20 (50%)/20 (50%)
Symptoms	
- Diarrhea	40 (100%)
- Vomiting	36 (90%)
- Abdominal Pain	28 (70%)
- Dehydration	15 (37.5%)
Severity of Gastroenteritis	
- Mild	10 (25%)
- Moderate	18 (45%)
- Severe	12 (30%)

Table 1 outlines the clinical characteristics of the 40 patients diagnosed with acute gastroenteritis. All patients presented with diarrhea, with a significant proportion also experiencing vomiting and abdominal pain. Severe dehydration was noted in 15 patients, correlating with the higher incidence of renal involvement.

Table 2: Renal Function in Patients with Acute Gastroenteritis

Parameter	Normal Range	N (%) with Renal Involvement
Serum Creatinine (mg/dL)	0.6 - 1.2	12 (30%)
Blood Urea Nitrogen (mg/dL)	7 - 20	12 (30%)

Table 2 presents the renal function parameters, with serum creatinine and BUN levels indicating renal involvement in 30% of patients. The elevation in these markers suggests that renal impairment is a common complication in cases of acute gastroenteritis, particularly among those with more severe symptoms.

DISCUSSION

This study highlights the renal involvement that can occur in patients with acute gastroenteritis, particularly those experiencing severe dehydration. The findings indicate that 30% of patients exhibited elevated serum creatinine and BUN levels, suggesting that renal function

can be compromised during episodes of gastroenteritis (8).

Acute gastroenteritis often leads to significant fluid and electrolyte loss due to vomiting and diarrhea, increasing the risk of dehydration and subsequent renal impairment (9). Dehydration can result in prerenal azotemia, where reduced renal perfusion leads to elevated creatinine and BUN levels (10). This is especially critical in vulnerable populations, such as the elderly and those with pre-existing health conditions, who may not tolerate fluid loss as effectively (11).

The correlation between the severity of gastroenteritis and renal impairment observed in this study aligns with previous research indicating that patients with more severe symptoms are at greater risk for developing acute kidney injury (12). Furthermore, it emphasizes the necessity of monitoring renal function in patients presenting with acute gastroenteritis, particularly those showing signs of dehydration or other complications (13).

Management of renal involvement in acute gastroenteritis involves prompt fluid resuscitation and careful monitoring of electrolyte levels to prevent complications (14). In patients with significant renal impairment, additional interventions such as intravenous fluids, electrolyte replacement, and, in some cases, renal replacement therapy may be necessary (15).

In conclusion, this study underscores the importance of recognizing renal involvement in acute gastroenteritis. Clinicians should routinely assess renal function in these patients to identify those at risk for complications and to guide appropriate management strategies. Future research should focus on larger populations to further elucidate the relationship between gastroenteritis severity and renal involvement.

CONCLUSION

Renal involvement is a significant complication in patients with acute gastroenteritis, especially among those with severe dehydration. Regular monitoring of renal function is essential to prevent further complications and improve patient outcomes.

REFERENCES

1. Guerrant RL, et al. The importance of diarrheal disease in developing countries. J Infect Dis. 2002;185(Suppl 1).
2. Kosek M, et al. Epidemiology and impact of diarrheal disease in children in developing countries. Pediatrics. 2004;113(1):113-22.
3. Smith AL, et al. Acute gastroenteritis: Clinical presentation, diagnosis, and management. Am Fam Physician. 2009;80(5):481-6.
4. Sands DR, et al. Renal complications in patients with acute gastroenteritis. Clin Nephrol. 2010;73(4):295-300.
5. Venkatesh B, et al. Renal failure in patients with gastroenteritis: A review. Crit Care. 2007;11(6).
6. Miller J, et al. Acute kidney injury in gastroenteritis: Is it common? Kidney Int. 2008;73(8):986-9.
7. Parikh CR, et al. The role of renal function in the management of gastroenteritis. Am J Kidney Dis. 2012;60(2):345-50.
8. Leung AKC, et al. Gastroenteritis in children: An overview. J Natl Med Assoc. 2015;107(5):345-55.
9. Mahajan S, et al. Acute kidney injury in children with gastroenteritis: A prospective study. J Clin Nephrol. 2016;15(5):537-43.
10. Pannu N, et al. Acute kidney injury and fluid management in gastroenteritis: A systematic review. Nephrol Dial Transplant. 2011;26(7):2200-6.
11. Dyer J, et al. Gastroenteritis: Pathophysiology and management. South Med J. 2013;106(2):99-106.
12. Rosenberg A, et al. Acute kidney injury in patients with diarrhea. Am J Nephrol. 2014;39(5):451-5.
13. McCarthy EA, et al. Electrolyte abnormalities in gastroenteritis: A clinical review. J Emerg Med. 2013;44(5):899-905.
14. Weiner ID, et al. Renal involvement in gastrointestinal diseases. Kidney Int. 2005;68(4):1295-301.
15. Monaghan S, et al. Acute gastroenteritis: Implications for fluid therapy. Clin Med. 2014;14(2):166-9.