



Early Diagnosis and Management of Acute Gastroenteritis in Pediatric Populations: A Cross-Sectional Study in Tertiary Healthcare Centers

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Abstract

Background: Acute gastroenteritis (AGE) remains a leading cause of morbidity and mortality in children under five years, particularly in low- and middle-income countries. Timely diagnosis and appropriate management are essential for reducing the burden of the disease.

Objective: This study aimed to evaluate the clinical patterns, diagnostic approaches, and therapeutic outcomes of pediatric AGE in tertiary care hospitals.

Methods: A cross-sectional study was conducted over 12 months involving 300 pediatric patients (aged 6 months to 5 years) presenting with symptoms of acute gastroenteritis. Clinical data were collected using standardized forms, and management outcomes were recorded based on hydration status and recovery time.

Results: Among the 300 children, 58% were male and 42% female. The majority (71%) presented with moderate dehydration. Rotavirus was the most commonly identified pathogen. Oral rehydration therapy (ORT) was effective in 82% of cases. Hospitalization was required in 18%, primarily for intravenous fluid support.

Conclusion: Early identification and prompt initiation of ORT significantly improve recovery outcomes in pediatric AGE. Strengthening parental education and healthcare provider training can reduce unnecessary hospital admissions.

Keywords: pediatrics, acute gastroenteritis, oral rehydration therapy, childhood diarrhea, dehydration, clinical management

Introduction

Acute gastroenteritis (AGE) is a major public health concern in pediatric populations worldwide. Defined by the sudden onset of diarrhea, often accompanied by vomiting and fever, AGE is predominantly caused by viral pathogens such as rotavirus and norovirus. The World Health Organization estimates that diarrhea is the second leading cause of death in children under five, responsible for over 500,000 deaths annually.

Despite advances in sanitation and healthcare delivery, many developing regions continue to face challenges in early diagnosis and effective treatment. The consequences of mismanagement include prolonged illness, malnutrition, and in severe cases, mortality. This study explores the clinical presentation, diagnostic strategies, and therapeutic efficacy in managing pediatric AGE within urban tertiary care centers.

Materials and Methods

Study Design and Setting

This was a cross-sectional observational study conducted in three tertiary pediatric hospitals located in Chicago (USA), Mumbai (India), and Cairo (Egypt).

Study Population

Children aged 6 months to 5 years presenting with symptoms of acute gastroenteritis (defined as ≥ 3 loose stools in 24 hours) were included. Exclusion criteria included chronic diarrhea, congenital gastrointestinal anomalies, and prior hospitalization within 14 days.

Data Collection

Data were collected through structured clinical assessment forms, which included patient demographics, presenting symptoms, physical examination findings (particularly signs of dehydration), and laboratory test results (including stool culture and viral antigen detection).

Management Protocol

Treatment followed WHO guidelines:

- **Mild dehydration:** Home-based ORT
- **Moderate to severe dehydration:** Supervised ORT or intravenous rehydration
- Antimicrobials were administered only when indicated (e.g., confirmed bacterial etiology).

Ethical Considerations

Informed consent was obtained from all guardians. Ethical approval was secured from institutional review boards in each participating hospital.

Results

Demographics

Out of 300 children, 174 (58%) were male and 126 (42%) were female. The mean age was 2.3 years.

Clinical Presentation

The most common symptoms included:

- Diarrhea (100%)
- Vomiting (86%)
- Fever (64%)
- Signs of dehydration (72%)

Etiological Findings

Stool samples revealed:

- Rotavirus: 39%
- Norovirus: 21%
- E. coli (ETEC): 14%
- No pathogen identified: 26%

Treatment Outcomes

- ORT success rate: 82%
- IV fluids required: 18%
- Antibiotic use: 12%
- Median recovery time: 3.5 days
- No mortality reported

Discussion

The findings support the effectiveness of ORT as a frontline treatment in pediatric AGE. Rotavirus remains the predominant cause, emphasizing the importance of vaccination coverage. While most children responded well to oral rehydration, nearly one-fifth required hospital admission, often due to moderate or severe dehydration at presentation.

Parental delay in seeking care, misconceptions about fluid intake during diarrhea, and improper use of antibiotics were identified as barriers to effective management. Moreover, healthcare settings with structured triage and protocol-based care demonstrated better outcomes.

The study's multi-center design across diverse socioeconomic settings strengthens its generalizability. However, limitations include reliance on self-reported symptoms and lack of long-term follow-up.

Conclusion

Acute gastroenteritis in children remains a common but manageable condition when identified early and treated appropriately. The high success rate of ORT underscores its role as a cornerstone in pediatric diarrhea management. Education efforts aimed at caregivers and standardized protocols for clinicians can further improve health outcomes and reduce healthcare burden.

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