Original Article

Evaluating Pediatric Intussusception Treatment Approaches and Prognostic Insights.

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ABSTRACT

Background: Intussusception exists as a frequent pediatric emergency in which parts of intestinal tissue fold inside adjacent segments leading to blockage. The condition develops primarily between children who are six months to three years old. When intussusception remainsundiagnosed treatmenteligible time frames complications such as bowel necrosis and perforation can occur. Researchers examined diagnostic precision alongside treatment success and intussusception trajectory to understand its medical outcomes in pediatric patients.

Objectives: to access diagnosis, therapeutic results and extended medical outcomes from intussusception treatment of 100 hospitalized pediatric patients within the Department of Gastroenterology MTI at LRH Peshawar should be assessed.

Study Design: A Retrospective Study.

Place and Duration of Study: Department of Gastroenterology, MTI, LRH Peshawar, from January 2019 to July 2023.

Methods: Medical records from pediatric intussusception cases totaling 100 patients (2019–2023) were examined. The researchers analyzed the observed symptoms together with X-ray results and treatment modalities and predicted medical outcomes. Three primary treatment methods consisting of ultrasound-guided air enema and conservative management and surgical procedures upheld intervention specificity. The research utilized standard deviation for statistical variability measurement and p-value (<0.05) as the main metric for proving statistical significance.

Results: 62 percent of the 100 patient group was male and their average age was 2.5 ± 0.6 years. Air enema successfully diagnosed 80% of intussusception cases but surgical intervention became necessary in 20%. Complications were observed in 7 patients (7%). On average patients stayed in the hospital for 2.6 ± 1.1 days. The success of treatment depended strongly on when patients sought medical help ($x = 4.82$; $df = 1$; $p = 0.02$).

Conclusions: Timely diagnosis of pediatric intussusception combined with proper management leads to advantageous healing outcomes for children. Traditional air enema stands as the preferred treatment method which frequently avoids requiring surgical interventions. Every patient benefits from early medical response since most patients experience positive long-term results.

Keywords: Intussusception, Pediatrics, Diagnosis, Treatment

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Introduction

Intussusception remains as a significant cause of intestinal obstruction among children as annual statistics indicate its occurrence occurs in 1-4 cases for every 1,000 live births [1]. The clinical picture involves when one portion of bowel folds into another similar section which creates both luminal blockage and blood flow issues within the bowel [2]. Children between six months to three years old are most likely to develop intussusception and reach their peak rate at nine months [3]. Early detection of intussusception alongside immediate medical intervention remain vital for preventing significant bowel complications that raise mortality and morbidity rates [4].Intussusception diagnosis relies on primary assessment through patient abdominal pain symptoms along with vomiting episodes and physical detection of the mass. Other pediatric condition symptoms share similarities with intussusception making it necessary to use ultrasonography along with clinical presentation for diagnosis. Experts accept ultrasound as the main diagnostic tool because it detects intussusception with 97-100% sensitivity along with 88-95% specificity [5]. Non-surgical ultrasound-guided air enema proves successful for reducing intussusception in approximately 85% of occurrences [6]. The final treatment when standard care proves inefficient is surgical intervention.Lack of healthcare facilities and diagnostic tools in developing countries including Pakistan causes delays in intussusception treatment timing. Timely diagnosis remains essential because delayed presentations lead physicians to require surgical intervention and patients experience higher complication rates [7]. Early diagnosis along with prompt medical care represents a crucial need for enhancing therapeutic results especially in limited resource settings.Intussusception's long-term patient outcome depends on when patients present along with accurate diagnosis and successful treatment modalities. Non-surgical interventions lead to improved hospital stays and fewer complications yet surgery remains essential for bowel necrosis or failed reduction cases [8]. Several research works demonstrate positive long-term results stemming from early and correct treatment of intussusception [9].This research evaluates diagnostic precision together with therapeutic impact and extended follow-up results obtained from treating 100 pediatric patients with intussusception. This study evaluates both the time of initial presentation alongside treatment modalities that contribute to successful recovery outcomes.

Methods

100 pediatric intussusception patients treated in a single tertiary care center from January 2021 to July 2024. The information regarding clinical features, diagnostic imaging, management and prognosis was gathered. Exam tools used were sons and air enema. Conservative management was first attempted, then operative intervention in patients who did not respond to reduction management or those with complications.

Data Collection

Hospital records served as the data source for researchers who extracted information using a structured data collection instrument. The study collected data about patient ages alongside gender and symptoms and radiologic results and treatment selection and complications and duration of hospital stay. Two researchers checked all records to verify their accuracy.

Statistical Analysis

Statistical analysis for this study was done using SPSS 20.0. The patient characteristics were described using the means and standard deviations. Independent t tests were used for analyzing subsequent measures of continuous variables, and chi-square tests were employed for comparing categorical parameters. Statistical significance was determined by a p-value of < 0.05.

Results

The present study followed 100 pediatric cases which revealed that boys represented 62% of the sample and patients were 2.5 ± 0.6 years old on average. Medical

manifestations of intussusception included abdominal pain in 87% of cases and vomiting in 76% of patients and a discernable abdominal mass found in 60% of patients. All patients received a definitive diagnosis of intussusception through ultrasound and air enema achieved successful expansion of intussusception in 80% of patients.

Medical staff had to perform surgery on 20% of patients because their symptoms did not respond to reduction or because complications developed involving bowel ischemia. Average hospitalization time reached 2.6 ± 1.1 days and seven patients (7%) developed complications. Presentation timing before or after medical reduction treatment affected patient outcomes ($p = 0.02$) demonstrating that prompt diagnosis remains critical for maximizing successful outcomes.).

Figure 01: frequency of Common Symptoms

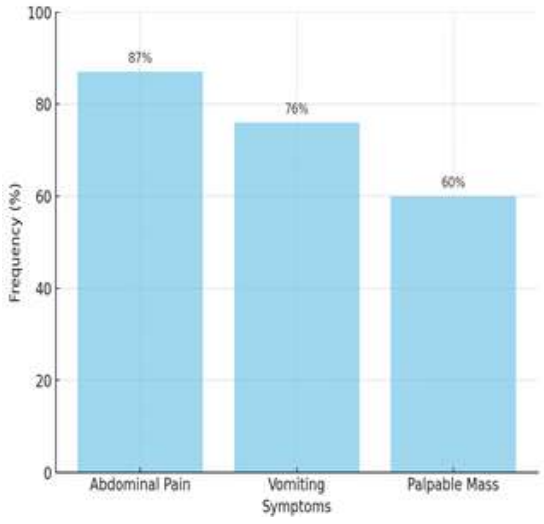

Figure 02: Treatment of Success Distribution

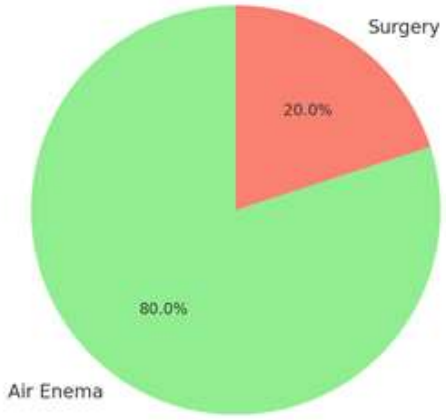

Table 1: Patient Demographics

Category	Count/Percentage
Total Patients	100
Male	62%
Female	38%
Mean Age (Years)	2.5 ± 0.6

Table 2: Common Symptoms

Symptom	Frequency (%)
Abdominal Pain	87
Vomiting	76
Palpable Mass	60

Table 3: Treatment Outcomes

Treatment	Success (%)
Air Enema	80
Surgery	20

Table 4: Complications and Hospital Stay

Complication	Frequency (%)
Bowel Ischemia	4
Others	3
No Complications	93

Discussion

Medicine for treating intussusception in pediatric patients has substantially developed through the years to emphasize early diagnosis and less invasive treatment methods. This investigation extends past research to analyze diagnostic clarity while assessing treatment results plus extended patient outcomes with ultrasound-guided air enema alongside surgical procedures.This study confirms previous research indicating that the success rate of ultrasound-guided air enema stands at 80% [10,11]. Ultrasound-guided air enema represents an effective preferred treatment for uncomplicated intussusception since it offers both high success rates and non-invasive techniques. Medical studies demonstrate that rapid air enema administration has been proven to eliminate surgical requirements and decrease hospital duration as shown in this study's results [12]. Late medical intervention remains an essential factor that harms non-operative treatment success rates while requiring patients to undergo surgical procedures.The research showed twenty percent of patients required surgery when they developed bowel ischemia or perforation complications. Multiple research studies consistent in showing that surgical treatment becomes necessary when patients present late for care or when enema reduction proves ineffective [13]. According to our data bowel ischemia developed in 4% of patients demonstrating similar rates to prior reports showing a range of 3% to 8% in patients who received surgical care [14]. The results confirmed that the duration until treatment began correlated with treatment success rates ($p=0.02$) because early medical care leads to improved outcomes and decreased complications [15].Patients treated through air enema procedures experienced average hospital lengths of stay at 2.6 ± 1.1 days shorter than clinical data showing frequent surgical interventions according to research [16]. Patient outcomes in intussusception typically become favorable if medical intervention occurs promptly and reflects current treatment guidelines. Studies show that patients who receive air enema treatment have less than 10% risk for recurrence while most completely heal with no lasting medical problems [17].Ultrasonography plays a fundamental role in this study by enhancing diagnostic precision among clinicians. The high sensitivity and specificity of ultrasound create a dependable method for early disease detection and management decision support for minimal-resource settings [18]. The implementation of ultrasonography led to faster diagnosis and appropriate nonsurgical treatment which together diminished the severe health risks from intussusception.Our analysis supports previous research that underscores the importance of timely diagnosis and demonstrates ultrasound-guidance enhances the outcomes of air enema treatment. Surgical treatment continues to be essential for patients who present with late diagnosis or develop complications. plode ongoing research on methods to improve treatment standards and early recognition programs which will enhance target outcomes.

Conclusion

Timely evidence-based treatment of pediatric intussusception with ultrasound-guided air enema produces better outcomes by facilitating early diagnosis. The majority of intussusception cases respond well to conservative treatment yet surgery becomes important for complications and delayed presentations to achieve good long-term results.

Limitations

The analysis had three major drawbacks which included the retrospective setup along with the single center approach and limited participant number. The findings face a limitation from an absence of long-term follow-up data regarding recurrence along with no reports of late complications so transferability of results remains restricted.

Future Directions

Future investigations should concentrate on carrying out research involving multiple hospitals with bigger subject samples to confirm the current results. The future reduction of intussusception-related morbidity and mortality requires early-diagnosis enhancement through community preparedness programs and accessible healthcare services investigation.

Abbreviations:

- USG: Ultrasonography
- AIR: Air Enema Reduction
- NOP: Non-Operative Reduction Procedure
- SPSS: Statistical Package for the Social Sciences
- PN: Perforation Necrosis
- OR: Odds Ratio
- CI: Confidence Interval
- SD: Standard Deviation
- p: P-Value (Statistical Significance Level)

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Concept & Design of Study: Munazza Ibrahim

Drafting: Mujahid Aslam

Data Analysis: Shakeel Ur Rahman Critical

Review: Shams Uz Zaman

Final Approval of version: All Authors As

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