Int. J Med. Pharm. Res. (P-ISSN: 2958-3675 | E-ISSN: 2958-3683)
Available on: https://ijmpr.in/

International Journal
of Medical and Pharmaceutical Research

ORGINAL ARTICLE **OPEN ACCESS**

Neonatal Intestinal Obstruction: A Study of Clinico-Demographic Profiles and Outcomes

Dr. Pratibha[1]*, Dr.Harsha, B. M[2], Dr.Koushik Herle[3]

[1]M.B.B.S, Post Graduate, Department of General Surgery, J. J. M. Medical College, FW38+R5H, Medical College Rd, MCC B Block, Kuvempu Nagar, Davanagere, Karnataka 577004, India
[2]Professor, Department of Paediatric Surgery, J. J. M. Medical College, FW38+R5H, Medical College Rd, MCC B Block, Kuvempu Nagar, Davanagere, Karnataka 577004, India
[3]Former Assistant Professor, Department of Paediatric Surgery, J. J. M. Medical College, FW38+R5H, Medical College Rd, MCC B Block, Kuvempu Nagar, Davanagere, Karnataka 577004, India

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***Corresponding Author**
Dr.Pratibha

M.B.B.S, Post Graduate, Department of General Surgery, J. J. M. Medical College, FW38+R5H, Medical College Rd, MCC B Block, Kuvempu Nagar, Davanagere, Karnataka 577004, India

Received: 01-09-2024
Accepted: 08-10-2024
Available online: 10-10-2024

A B S T R A C T

Background: Neonatal intestinal obstruction is a common surgical emergency associated with significant morbidity and mortality. Prompt diagnosis and appropriate intervention are essential to improve survival outcomes. ***Aim***: To evaluate the clinico-demographic profile and outcomes of neonatal intestinal obstruction in a tertiary care setting. ***Methods***: This prospective study included 32 neonates who presented with symptoms of intestinal obstruction and underwent surgical intervention from January 2019 to September 2023. Data on clinical presentation, surgical treatment, and outcomes were collected and analyzed. ***Results***: Of the 32 neonates, 20 (62.5%) were male, and 12 (37.5%) were female. The most common cause of intestinal obstruction was intestinal atresia (10 cases, 31.25%), followed by malrotation (7 cases, 21.8%). The most frequent symptoms were vomiting (seen in 17 cases, 53.1%), failure to pass stool (14 cases, 43.75%), and abdominal distension (10 cases, 31.25%). A total of 25 neonates (78.13%) were successfully discharged, while the mortality rate was 21.87% (7 cases). ***Conclusion***: Intestinal atresia is the leading cause of neonatal intestinal obstruction in this study. Early diagnosis and multidisciplinary management can significantly improve outcomes.

Keywords: Neonatal intestinal obstruction, intestinal atresia, malrotation, neonatal surgery, clinical outcomes.

INTRODUCTION

Neonatal intestinal obstruction is a critical condition that requires prompt diagnosis and surgical intervention to prevent life-threatening complications. It is a common surgical emergency in the neonatal period, with an incidence of approximately 1 in 1500 live births [1]. The etiology of neonatal intestinal obstruction is diverse, with congenital anomalies being the most frequent cause. These anomalies include intestinal atresia, malrotation, meconium ileus, Hirschsprung's disease, and anorectal malformations [2]. Acquired causes, such as necrotizing enterocolitis and meconium plug syndrome, also contribute to a significant proportion of cases [3].

Early recognition of the signs and symptoms of neonatal intestinal obstruction is crucial for timely management. The most common presenting features include bilious vomiting, abdominal distension, and failure to pass meconium [4]. Delayed diagnosis can lead to serious complications, such as bowel ischemia, perforation, sepsis, and even death [5]. Therefore, a high index of suspicion and prompt diagnostic evaluation are essential to improve outcomes.

Radiological investigations play a vital role in the diagnosis of neonatal intestinal obstruction. Plain abdominal radiographs can reveal dilated bowel loops, air-fluid levels, and the presence of calcifications in cases of meconium peritonitis [6]. Contrast studies, such as upper gastrointestinal series and contrast enema, help identify the level and cause of obstruction [7]. Ultrasonography is also useful in detecting associated anomalies and evaluating the viability of the bowel [8].

The management of neonatal intestinal obstruction primarily involves surgical correction of the underlying cause. The specific surgical approach depends on the etiology and the patient's clinical condition. Intestinal atresia is typically managed by resection of the atretic segment and primary anastomosis [9]. Malrotation requires Ladd's procedure, which involves the division of Ladd's bands, widening of the mesenteric base, and appendectomy [10]. In cases of meconium ileus, enterostomy or resection with primary anastomosis may be necessary [11].

Postoperative care is crucial for the successful management of neonatal intestinal obstruction. Neonates often require intensive care support, including mechanical ventilation, fluid and electrolyte management, and parenteral nutrition [12]. Close monitoring for complications, such as sepsis, short bowel syndrome, and adhesive bowel obstruction, is essential [13].

Despite advancements in neonatal care, the mortality rate associated with neonatal intestinal obstruction remains significant, ranging from 10% to 30% [14]. Factors contributing to poor outcomes include prematurity, low birth weight, associated congenital anomalies, and delayed presentation [15]. Therefore, early diagnosis, appropriate surgical intervention, and multidisciplinary management are crucial to improve survival and long-term outcomes.

This study aims to evaluate the clinico-demographic profile and outcomes of neonatal intestinal obstruction in a tertiary care setting. By analyzing the presenting features, etiological factors, surgical management, and postoperative outcomes, we intend to provide valuable insights into the management of this challenging condition.

Aims:

1. To assess the clinico-demographic characteristics of neonates with intestinal obstruction.
2. To evaluate surgical outcomes and post-operative recovery in neonates undergoing surgery for intestinal obstruction.

Methods

This prospective observational study was conducted at J.J.M. Medical College, Davanagere, from January 2019 to September 2023. A total of 32 neonates diagnosed with intestinal obstruction based on clinical signs and radiological findings were included in the study. Inclusion criteria consisted of neonates of either gender presenting with both acute and chronic forms of intestinal obstruction. Exclusion criteria involved neonates with non-surgical causes of obstruction. The patients underwent surgical correction of the underlying anomaly, and data were collected on demographics, clinical presentations, surgical procedures, and outcomes. Statistical analysis was performed using appropriate software, and results were expressed as percentages and proportions.

RESULTS

The study included 32 neonates, of which 20 were male (62.5%) and 12 were female (37.5%). The mean age at presentation was 3 days. The most frequent congenital anomaly leading to intestinal obstruction was intestinal atresia, affecting 10 patients (31.25%), followed by malrotation (7 cases, 21.8%)(Table 2). Other causes included patent vitellointestinal duct and midgut volvulus. Vomiting was the most common presenting symptom (17 cases, 53.1%), followed by failure to pass stool (14 cases, 43.75%) and abdominal distension (10 cases, 31.25%) (Table 1). Antenatal diagnosis of intestinal obstruction was made in 3 cases (9.3%). Out of the 32 patients, 25 (78.13%) were successfully discharged, while 7 patients (21.87%) died due to complications such as sepsis and respiratory distress (Table 3).

Table 1: Demographic and Clinical Characteristics of Neonates with Intestinal Obstruction

Characteristic	Value
Total Patients	32
Male	20 (62.5%)
Female	12 (37.5%)
Mean Age at Presentation (days)	3
Presenting Symptoms:	
- Vomiting	17 (53.1%)
- Failure to Pass Stool	14 (43.75%)
- Abdominal Distension	10 (31.25%)

Table 2: Distribution of Causes of Neonatal Intestinal Obstruction

Cause	Frequency
Intestinal Atresia	10 (31.25%)
Malrotation	7 (21.8%)
Patent Vitellointestinal Duct	2 (6.25%)
Midgut Volvulus	2 (6.25%)
Others	1 (3.125%)

Table 3: Surgical Interventions and Outcomes

Outcome	Value
Total Patients Operated	32
Discharged	25 (78.13%)
Mortality	7 (21.87%)

DISCUSSION

The findings of this study highlight the critical role of early diagnosis and prompt surgical management in neonatal intestinal obstruction. Congenital anomalies such as intestinal atresia and malrotation were the leading causes, which is consistent with other studies in this field [16, 17]. The mortality rate in this study was 21.87%, which aligns with global estimates of mortality in neonatal surgical emergencies [18]. Key factors contributing to poor outcomes included late presentation and complications such as sepsis [19]. The need for a multidisciplinary approach, involving neonatologists, pediatric surgeons, and radiologists, is essential to optimize outcomes in these vulnerable patients.

Challenges such as performing contrast studies in neonates with respiratory distress and managing post-operative parenteral nutrition were common in this study. Adequate post-surgical care, including infection control and nutritional support, is vital to improve recovery [20].

The strengths of this study include its prospective design, detailed clinical and demographic data collection, and comprehensive analysis of outcomes. However, the relatively small sample size and single-center setting may limit the generalizability of the findings. Future multi-center studies with larger cohorts are necessary to validate these results and identify potential strategies to improve outcomes.

CONCLUSION

Neonatal intestinal obstruction is a surgical emergency, with intestinal atresia being the most common cause in this study. Early referral and multidisciplinary management play a crucial role in reducing morbidity and mortality. Improved diagnostic techniques, timely surgical intervention, and optimized postoperative care are essential to enhance survival outcomes in these neonates. Continued research and efforts to raise awareness about the early signs and symptoms of neonatal intestinal obstruction among healthcare providers and parents can contribute to better outcomes.

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