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CLINICAL PROFILE AND OUTCOME OF ACUTE INTESTINAL OBSTRUCTION AMONG ADULTS IN A TERTIARY CARE CENTRE IN KERALA

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ABSTRACT

Background: Acute intestinal obstruction (IO) is a common surgical emergency with significant morbidity and mortality. Etiology and outcomes vary geographically. Aim: To study the clinical profile, management, and outcomes of acute intestinal obstruction in a tertiary care centre in Kerala.
Methods: A record-based descriptive study was conducted on 116 adult patients admitted with acute dynamic intestinal obstruction in 2021. Data on demographics, clinical features, etiology, imaging, management, and outcomes were analysed using SPSS 27.
Results: The mean age was 57.07 years, with male predominance (71.6%). The most common symptom was abdominal distension (85.3%), followed by constipation (75.9%). Adhesions (35.3%) were the leading cause, followed by internal hernia (24.1%) and obstructed hernia (14.7%). Sensitivity of X-ray and USG in diagnosis was 64.7% and 77.6%, respectively. Surgical management was required in 85% of cases. Postoperative complications occurred in 27.6%, with surgical site infection being most common (21.3%). Mortality was 16.4%, primarily associated with sepsis and bowel gangrene.
Conclusion: The pattern of intestinal obstruction in this region differs from Western reports, with obstructed hernia being a significant cause. High mortality underscores the need for early diagnosis, prompt surgical intervention, and vigilant postoperative care.

Keywords: *Intestinal obstruction, adhesions, hernia, mortality, Kerala, tertiary care.*

INTRODUCTION

Acute intestinal obstruction is a frequent and critical surgical emergency encountered in healthcare settings globally. It accounts for nearly 15% of hospital admissions for acute abdominal pain and approximately 20% of cases requiring urgent surgical intervention (1,2). Annually, this condition is responsible for an estimated 30,000 deaths worldwide, underscoring its significance as a major contributor to surgical morbidity and mortality.The etiology of intestinal obstruction exhibits considerable geographical and socio-economic variation. In high-income nations, the leading causes are often postoperative adhesions, hernias, and malignancies (4). In contrast, in low- and middle-income countries, obstructed external hernias, tubercular strictures, and adhesive bands are reported to be more predominant (5). This disparity highlights the influence of local surgical practices, disease prevalence, and access to elective surgical care on the presentation of this condition.

Despite substantial advancements in diagnostic modalitiessuch as computed tomography and ultrasonographyand improvements in perioperative management, intestinal obstruction continues to carry a substantial risk. Reported mortality rates remain highly variable, ranging from 3% to as high as 30%, influenced by factors such as timeliness of intervention, patient comorbidities, and the presence of bowel ischemia or strangulation (6). The key to mitigating

adverse outcomes lies in early recognition, accurate diagnosis, and timely surgical or conservative management to prevent life-threatening complications like bowel gangrene, perforation, and sepsis.In the context of Kerala, a state in southern India with a distinct healthcare landscape and disease burden, there is a notable paucity of recent and comprehensive data on the clinical profile and outcomes of acute intestinal obstruction. Existing studies from other regions of India and similar settings suggest unique epidemiological and etiological patterns, yet localized evidence is essential to inform clinical practice and resource allocation.This study, therefore, aims to bridge this knowledge gap by conducting a detailed analysis of the etiology, clinical presentation, management strategies, and outcomes of acute intestinal obstruction among adults presenting to a major tertiary care centre in Kerala. The findings are intended to enhance local clinical protocols, support timely decision-making, and contribute to the broader understanding of intestinal obstruction in South India.

MATERIALS AND METHODS

This study was designed as a retrospective, record-based descriptive analysis conducted at Government Medical College, Thiruvananthapuram, a major tertiary care referral center in Kerala, South India. The institution serves a diverse population and provides comprehensive surgical care, making it an appropriate setting to examine the clinical and epidemiological profile of acute intestinal obstruction. The study utilized inpatient medical records from the calendar year 2021, retrieved systematically from the hospital's medical records library. The target population comprised adult patients aged 18 years and above who were admitted to the Department of General Surgery with a diagnosis of acute dynamic intestinal obstruction, as per the ICD-10 classification (K56.6). Only patients with complete and accessible medical records were included to ensure data integrity and reliability.

The sample size was calculated using the standard formula for estimating a single proportion with 95% confidence and 20% relative precision. Based on previous literature indicating that vomiting is present in approximately 54.7% of intestinal obstruction cases, the required sample size was determined to be 116 subjects (7). Patients were included if they met the following criteria: age ≥18 years, confirmed diagnosis of acute dynamic intestinal obstruction, and availability of complete medical documentation encompassing clinical history, physical examination findings, investigation reports, treatment details, and outcome data. Exclusion criteria comprised incomplete or inadequately documented records, cases of adynamic (paralytic) ileus or pseudo-obstruction, and obstructions attributable to non-mechanical causes such as metabolic, neurological, or functional disorders.

Data collection was performed using a structured, pre-tested proforma designed to capture comprehensive clinical and demographic variables. Information extracted from the medical records included patient demographics (age and sex), presenting symptoms (abdominal pain, vomiting, distension, constipation), clinical signs (abdominal tenderness, visible peristalsis, bowel sounds, findings on per rectal examination), etiology of obstruction (as determined intraoperatively or through imaging), results of diagnostic imaging studies (abdominal X-ray, ultrasonography [USG], and contrast-enhanced computed tomography [CECT] where available), details of management (conservative versus surgical, type of surgical procedure performed), and clinical outcomes (postoperative complications such as surgical site infection, pneumonia, sepsis, anastomotic leak, burst abdomen, enterocutaneous fistula, and prolonged ileus; duration of hospital stay; and mortality). Data abstraction was carried out solely by the principal investigator to maintain consistency and minimize inter-observer variability.

All collected data were entered into a Microsoft Excel spreadsheet for initial organization and subsequently imported into SPSS version 27 for statistical analysis. Given the descriptive nature of the study, analysis was primarily focused on summarizing the data. Categorical variables were expressed as frequencies and percentages, while continuous variables were summarized as mean and standard deviation. Inferential statistical tests were not applied. Graphical representations, including bar charts and pie diagrams, were created to visualize the distribution of key variables such as age, sex, etiology, and complications.

Ethical approval for the study was obtained from the Institutional Ethics Committee of Government Medical College, Thiruvananthapuram (HEC No: 12/03/2023/MCT). Due to the retrospective design and use of anonymized patient records, the requirement for individual informed consent was waived by the committee. Strict measures were implemented throughout the study to ensure patient confidentiality; all data were de-identified prior to analysis and were used exclusively for academic and research purposes.

RESULTS

Demographics

A total of 116 patients with acute intestinal obstruction were included in the study. The mean age of the cohort was 57.07 years, with a standard deviation of ±14.21 years, indicating a wide age distribution. However, the peak incidence was observed in the 50–60-year age group, comprising 40.7% of the study population. The demographic profile revealed a

strong male predominance, with 83 patients (71.6%) being male and 33 (28.4%) female, yielding a male-to-female ratio of 2.5:1.

Table 1Demographic Characteristics of Study Participants (n=116)

Characteristic	Value
Mean Age (years)	57.07 ± 14.21
Median Age (years)	57.5
Age Range (years)	26–87
Gender	
Male	83 (71.6%)
Female	33 (28.4%)
Male:Female Ratio	2.5:1

Clinical Presentation

The most frequently reported symptom was abdominal distension, present in 99 patients (85.3%). This was followed by constipation in 88 patients (75.9%), abdominal pain in 78 (67.2%), and vomiting in 31 (26.7%). On physical examination, the most common sign was abdominal distension (56.9%), while visible peristalsis was noted in 36 patients (31%). Bowel sounds were documented as a significant finding in 13 patients (11.2%), and relevant per rectal findings were recorded in 6 patients (5.2%).

Table 2: Clinical Presentation of Acute Intestinal Obstruction

Symptom/Sign	Frequency (n)	Percentage (%)
Symptoms		
Abdominal Distension	99	85.3
Constipation	88	75.9
Abdominal Pain	78	67.2
Vomiting	31	26.7
Signs		
Abdominal Distension	66	56.9
Visible Peristalsis	36	31.0
Bowel Sounds	13	11.2
Positive PR Findings	6	5.2

Etiology of Obstruction

The underlying causes of intestinal obstruction were diverse. Adhesions were the most common etiology, accounting for 41 cases (35.3%). This was followed by internal hernia in 28 cases (24.1%) and obstructed external hernia in 17 cases (14.7%). Other notable causes included malignancy and volvulus, each seen in 7 patients (6%), and bands, also in 7 patients (6%). Less frequent causes were paralytic ileus (4 cases, 3.4%), enteric stricture (2 cases, 1.7%), intussusception (2 cases, 1.7%), and ileosigmoid knotting (1 case, 0.9%).

Table 3: Etiological Distribution of Acute Intestinal Obstruction

Cause of Obstruction	Frequency (n)	Percentage (%)
Adhesions	41	35.3
Internal Hernia	28	24.1
Obstructed Hernia	17	14.7
Malignancy	7	6.0
Volvulus	7	6.0
Band	7	6.0
Paralytic Ileus	4	3.4
Enteric Stricture	2	1.7
Intussusception	2	1.7
Ileosigmoid Knotting	1	0.9
Total	**116**	**100**

Diagnostic Imaging

Plain abdominal radiography (erect and supine) was performed in all patients and was diagnostic in 75 cases (64.7%), while it was non-diagnostic in 41 (35.3%). Ultrasonography (USG) of the abdomen, conducted in all cases, demonstrated a higher diagnostic sensitivity, correctly identifying obstruction in 90 patients (77.6%). Contrast-enhanced computed

tomography (CECT) of the abdomen was performed selectively in 40 cases and successfully identified both the presence and the specific cause of obstruction in all 40 patients (100% diagnostic accuracy).

Table 4: Diagnostic Accuracy of Imaging Modalities

Imaging Modality	Diagnostic	Non-Diagnostic	Sensitivity (%)
X-ray Abdomen	75	41	64.7
USG Abdomen	90	26	77.6
CECT Abdomen*	40	0	100.0
*Performed in 40 selected cases.			

Management

Initial management included resuscitation, nasogastric decompression, and intravenous antibiotics. Conservative management with vigilant monitoring was successful in 13 patients (11.2%). The remaining 103 patients (88.8%) required surgical intervention. The most common surgical procedure performed was resection and anastomosis, undertaken in 52 patients (44.8% of total, 50.5% of operative cases). This was followed by primary hernia repair in 29 patients (25% of total, 28.2% of operative cases). Other procedures included adhesiolysis/band lysis, stoma formation, and reduction of intussusception or volvulus.

Table 5: Management Strategies and Surgical Procedures

Management/Surgery	Frequency (n)	Percentage (%)
Overall Management		
Conservative	13	11.2
Surgical	103	88.8
Surgical Procedures		
Resection & Anastomosis	52	44.8
Hernia Repair	29	25.0
Adhesiolysis/Band Lysis	12	10.3
Colostomy/Ileostomy	6	5.2
Hartmann's Procedure	2	1.7
Reduction of Intussusception	2	1.7
Total Surgical	**103**	**100**

Postoperative Complications

Postoperative complications were observed in 32 patients, constituting 27.6% of the study cohort. The most frequent complication was surgical site infection, occurring in 10 patients (21.3% of those with complications). Prolonged paralytic ileus (lasting >72 hours) was noted in 6 patients (13.8%), and pneumonia was diagnosed in 6 patients (12.5%). Sepsis developed in 5 patients (10.6%). Less common but significant complications included anastomotic leak and burst abdomen, each occurring in 2 patients (3.1%), and enterocutaneous fistula formation in 1 patient (1.3%).

Table 6: Postoperative Complications

Complication	Frequency (n)	Percentage of Total Patients (n=116)	Percentage of Complicated Cases (n=32)
Surgical Site Infection	10	8.6%	21.3%
Prolonged Ileus (>72h)	6	5.2%	13.8%
Pneumonia	6	5.2%	12.5%
Sepsis	5	4.3%	10.6%
Anastomotic Leak	2	1.7%	3.1%
Burst Abdomen	2	1.7%	3.1%
Fistula Formation	1	0.9%	1.3%
Total with Complications	**32**	**27.6%**	**100%**

Mortality

The overall mortality rate was 16.4% (19 out of 116 patients). Mortality was closely associated with the development of severe postoperative complications, particularly sepsis. A significant proportion of deaths occurred in patients who presented late, had evidence of bowel gangrene at surgery, or had significant pre-existing comorbidities. This mortality rate aligns with reports from other tertiary care centers in developing regions.

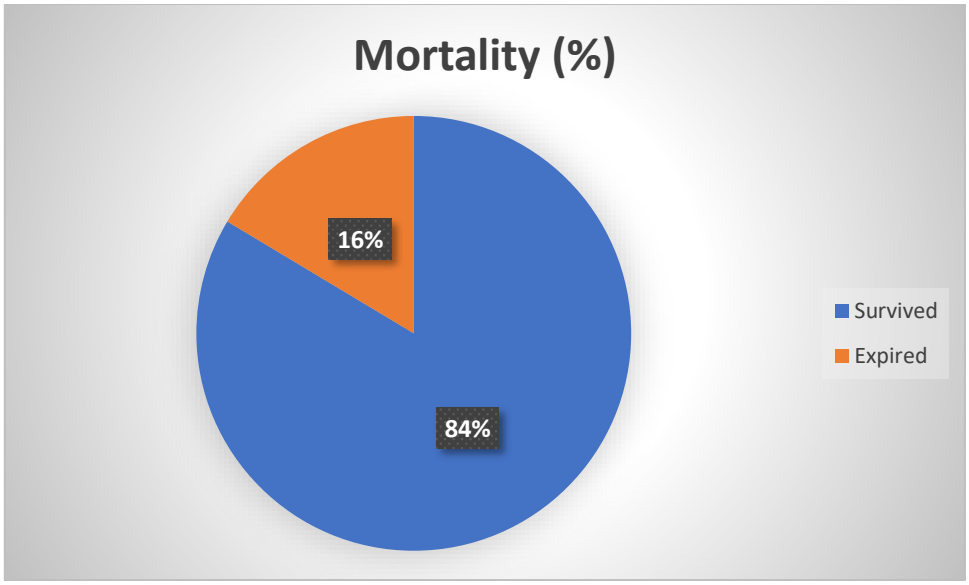

FIGURE1: Mortality Outcomes

DISCUSSION

The findings of this study delineate a distinct epidemiological and clinical profile of acute intestinal obstruction (AIO) in a tertiary care setting in Kerala, South India. Our results reveal that adhesions (35.3%), internal hernia (24.1%), and obstructed external hernia (14.7%) are the predominant etiologies. This pattern diverges from Western literature, where postoperative adhesions account for up to 60–75% of small bowel obstructions (19,20), and obstructed hernias have become relatively uncommon due to widespread elective hernia repair (14). The high prevalence of hernial causes in our cohort aligns with data from other developing regions, such as Nigeria and Eastern India, where obstructed hernias are reported as the first or second most common cause (12,13,21). This highlights the persistent burden of untreated or undiagnosed external hernias in resource-limited settings, underscoring a critical area for public health intervention and surgical outreach programs.

The demographic profile of our patientspredominantly males in their sixth decadeis consistent with multiple studies from Asia and Africa (12,13,22). This contrasts with more balanced gender distributions reported in European and North American series, which often reflect adhesive obstructions secondary to previous pelvic or gynecological surgeries in women (14,23). The male predominance in our study likely reflects a higher incidence of labor-intensive occupations, delayed healthcare-seeking behavior, and a greater prevalence of untreated external hernias among men in our community.

The clinical presentation was classic, with abdominal distension, constipation, and pain being the most frequent symptoms. However, the relatively low reported rate of vomiting (26.7%) compared to some series (24) may be attributable to varying definitions or documentation practices. The high diagnostic yield of plain radiography (64.7%) and ultrasonography (77.6%) in our study supports their continued role as accessible and effective first-line imaging tools in the emergency setting, especially where advanced imaging is limited (8,9,17). Ultrasonography, in particular, offers the advantages of being bedside, non-invasive, and free of ionizing radiation, with a sensitivity comparable to that reported by Ogata et al. (9). Contrast-enhanced computed tomography (CECT), while performed selectively, demonstrated 100% diagnostic accuracy for both identifying obstruction and determining its cause, confirming its status as the imaging gold standard for complex or equivocal cases (10,18,25). Its ability to identify signs of ischemia (e.g., pneumatosis, portal venous gas, lack of bowel wall enhancement) makes it invaluable for surgical planning and prognostication (26).

The high rate of surgical intervention (88.8%) reflects the severity of presentation and the mechanical, often complete, nature of obstructions in our cohort. The most common surgical proceduresresection and anastomosis (44.8%) and hernia repair (25%)are consistent with the leading etiologies. The conservative management success rate of 11.2% is lower than rates of 20–40% reported in some series focused on adhesive obstructions (27,28). This discrepancy likely stems from the higher proportion of irreducible hernias and internal hernias in our population, which are less amenable to non-operative resolution.

The morbidity and mortality rates in our study are significant. Postoperative complications occurred in 27.6% of patients, with surgical site infection (21.3% of complicated cases) being the most common, mirroring findings from similar

hospital-based studies in tropical environments (29,30). The overall mortality rate of 16.4% is higher than the 3–8% often cited in contemporary high-income country series (15,31) but is comparable to figures from other tertiary centers in India and sub-Saharan Africa, where rates of 10–20% are reported (11,16,32). This elevated mortality is multifactorial. It is strongly associated with delayed presentation, which increases the risk of bowel strangulation and gangrenea finding corroborated by other authors (33,34). The development of sepsis and multi-organ dysfunction was the most critical determinant of poor outcome in our cohort. Other contributing factors likely include advanced patient age, nutritional status, and limited access to intensive postoperative care facilities.

Several limitations of this study warrant consideration. The retrospective, single-center design may limit the generalizability of the findings and is susceptible to biases inherent in medical record reviews, such as incomplete documentation. The sample size, while adequate for descriptive analysis, limits the power for more complex multivariate analyses to identify independent risk factors for mortality. Furthermore, detailed data on specific comorbidities, nutritional indices, and precise time intervals from symptom onset to presentation were not consistently available for analysis.

Future research should focus on prospective, multicenter studies to validate these findings across different healthcare tiers in Kerala. Investigating strategies to reduce delays in presentation through community awareness programs and studying protocols for the selective use of CECT to expedite diagnosis of strangulation are crucial next steps. Additionally, quality improvement initiatives aimed at reducing surgical site infections and improving sepsis management could directly impact morbidity and mortality.

CONCLUSION

In conclusion, this study provides a detailed contemporary profile of acute intestinal obstruction in a South Indian tertiary care center. The etiological triad of adhesions, internal hernia, and obstructed hernia, along with a significant male preponderance and high mortality, distinguishes the local pattern from Western data. While plain radiography and ultrasonography remain valuable diagnostic tools, CECT is definitive. The high rates of surgical intervention and mortality highlight the severity of the condition in this setting and underscore the need for early diagnosis, prompt surgical management, and robust postoperative care to improve outcomes. Addressing the burden of untreated hernias through public health initiatives could significantly reduce the incidence of this surgical emergency.

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DECLARATION

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