DOI: https://doi.org/10.54393/pjhs.v6i6.2741

PAKISTAN JOURNAL OF HEALTH SCIENCES
(LAHORE)
https://thejas.com.pk/index.php/pjhs
ISSN (E): 2790-9352, (P): 2790-9344
Volume 6, Issue 06 (June 2025)

Original Article

OPEN ACCESS

Age-Specific Risk Factors and Post-Operative Complications in Patients with Intestinal Obstruction

Hassan Shoukat[1*], Muhammad Ismail Yar Khan Uttra[1], Muhammad Khan Malik[2], Abdus Salam[1], Madeeha Shahid[1] and Tariq Mahmood[1]

[1]Department of Surgery, Niazi Medical and Dental College, Sargodha, Pakistan
[2]Department of Medicine, Faisal Masood Teaching Hospital, Sargodha, Pakistan

ARTICLE INFO

Keywords:
Risk Factors, Intestinal Obstruction, Post-Operative, Complications

How to Cite:
Shoukat, H., Uttra, M. I. Y. K., Malik, M. K., Salam, A., Shahid, M., & Mahmood, T. (2025). Age-Specific Risk Factors and Post-Operative Complications in Patients with Intestinal Obstruction: Post-Operative Complications in Patients with Intestinal Obstruction. Pakistan Journal of Health Sciences, 6(6), 97-101. https://doi.org/10.54393/pjhs.v6i6.2741

***Corresponding Author:**
Hassan Shoukat
Department of Surgery, Niazi Medical and Dental College, Sargodha, Pakistan
hassanshoukat1984@gmail.com

Received Date: 7th January, 2025
Revised Date: 20th June, 2025
Acceptance Date: 23rd June, 2025
Published Date: 30th June, 2025

ABSTRACT

Intestinal obstruction is among the most prevalent surgical challenges, which impacts millions of individuals and contributes significantly to morbidity and mortality. **Objectives:** To investigate the age-specific causes and post-operative complications in patients with intestinal obstruction. **Methods:** All patients who were clinically diagnosed with intestinal obstruction and subsequently underwent surgical intervention were enrolled in this prospective study. Participants were categorized into four age groups. Patients found to have peritonitis without evidence of obstruction during laparotomy were excluded. Operative and histopathological findings were documented, and the data were summarized using frequencies and percentages. **Results:** The study included 305 patients, 146 males (47.9%) and 159 females (52.1%). The most common causes of intestinal obstruction in group A were tuberculosis (n=32, 35.2%), and adhesions (n=22, 33.3%) were a common etiological factor in group B; malignancies predominated in the elderly. The incidence of post-operative complications was 7.21%. **Conclusions:** It was concluded that the etiology of intestinal obstruction in adults varies significantly with age, necessitating age-specific diagnostic and therapeutic approaches.

INTRODUCTION

Intestinal obstruction is among the most prevalent surgical challenges that surgeons encounter in their practice. It impacts millions of individuals and is a major cause of surgical admissions globally, contributing significantly to morbidity and mortality [1]. Intestinal obstruction typically manifests with crampy abdominal pain, vomiting, and abdominal distension. In large bowel obstruction, symptoms differ slightly, with constipation often reported and, in some cases, an inability to pass gas [2]. Intestinal obstruction may lead to perforation, causing peritonitis. Strangulation and gangrene are common in cases of obstructed hernia, and septicemia from these complications can result in multi-organ failure and potentially death [3]. Diagnosis is primarily clinical but can be confirmed with an abdominal x-ray [4]. Intestinal obstruction can be classified in several ways. Based on the affected segment of the gastrointestinal tract, it is categorized as either small bowel or large bowel obstruction. Additionally, it can be classified as mechanical or functional, depending on the underlying pathophysiology of the obstruction [5]. The causes of intestinal obstruction vary across different age groups, as reported in the literature [6]. Small bowel obstruction constitutes 80% of obstruction cases, while large bowel obstruction makes up 20%. Adhesions, hernias, tuberculosis, and neoplasms are responsible for 90% of

DOI: https://doi.org/10.54393/pjhs.v6i6.2741

small bowel obstruction cases [7]. Adhesions are most frequent, with various preventive measures recommended during initial surgeries to minimize their occurrence [8]. Adhesive small bowel obstruction accounts for 55–75% of cases, with hernias and small bowel tumors comprising the rest [9]. In lower-middle-income countries, intestinal tuberculosis is a significant cause of obstruction, although it is challenging to diagnose [10, 11]. However, in regions where the disease is endemic, maintaining a high index of suspicion is crucial. Notably, tuberculosis cases have shown an upward trend of 3.6% from 2020 to 2021 [12]. Large bowel obstruction is most commonly caused by colorectal malignancies, which usually manifest at an advanced stage of the disease. In large bowel obstruction, lesions typically occur in the sigmoid or rectosigmoid area [13, 14]. Treatment options for intestinal obstruction vary widely based on the diagnosis, bowel condition, and patient status. However, the initial management of acute intestinal obstruction should include fluid replacement, decompression of the obstructed bowel, and prevention of aspiration [15]. Subsequent management of intestinal obstruction may involve surgical intervention. Surgical options include the release of adhesions, resection and anastomosis, removal of constricting bands, de-rotation of volvulus, and sigmoidoscopy [16]. Surgery is a common treatment modality but sometimes leads to postoperative complications [17]. Despite extensive literature on the causes of intestinal obstruction, few studies have systematically analyzed age-stratified etiological patterns in adult populations. In Pakistan, tuberculosis prevalence paradoxically remains endemic due to sociocultural and dietary factors; there is a paucity of data on age-specific causes of intestinal obstruction in this region.

This study aims to investigate the age-specific risk factors and post-operative complications in patients with intestinal obstruction. Implementation of evidence-based, age-stratified approaches could significantly improve patient care and resource utilization in surgical practice.

METHODS

A prospective cross-sectional study was conducted at Niazi Welfare Foundation Teaching Hospital, Sargodha, during a period of 22 months from February 2023 to December 2024. The study gained ethical approval from the institutional review committee on February 1, 2023 (Approval No: NM&DC-IRB-63; Ref No: IRB/NM&DC/175) and followed all ethical regulations during the entire study duration. A written informed consent, along with voluntary participation, was obtained from study participants. A sample size of 305 was calculated on open Epi software using the formula n= z2pq/d2 with a 5.6% margin of error at a 95% confidence level based on a 47.9% prevalence of intestinal obstruction from a prior study [18]. Using a consecutive sampling technique, the study included participants diagnosed with intestinal obstruction based on clinical assessment, along with a surgical approach. Those individuals having peritonitis without obstruction during the surgical procedure and diagnosed with paralytic ileus were excluded. The selected individual were categorized in four groups according to age; Group A belongs to young adults from age 18 to 30 years, group B involved middle aged 31-45 years, 46 to 60 years' group C were old aged, and >60 years were elderly in group D. All patients presenting with abdominal pain, vomiting, and constipation were evaluated for abdominal distension and assessed for suspected intestinal obstruction. Abdominal X-rays (by Hitachi 500mA machine) were obtained in the Emergency Department, and those demonstrating multiple air-fluid levels and bowel dilation were provisionally diagnosed with obstruction. Initial management included resuscitation and essential baseline investigations to support further clinical decision-making. Investigations included complete blood count (by Sysmex hematology analyzer A 2388), random blood glucose (by the automated chemistry analyzer, Roche Cobas c311), hepatitis B and C screening (by Abbott Determine™ for hepatitis B surface antigen and Bionike Inc. for anti-HCV), chest radiography (Hitachi Digital X-ray Machine MA5000), and electrocardiography (by Bionet Cardio Touch 2000). After obtaining anesthesia clearance, all patients underwent exploratory laparotomy. Intraoperative findings were documented using a standardized form. Surgical interventions were tailored according to the identified cause of obstruction, and biopsy samples were obtained when deemed appropriate. Final diagnoses were confirmed through histopathological analysis, by processing tissue specimens obtained during the surgical procedure for standardized protocols (formalin fixation, paraffin embedding, H&E staining). All reports were generated by consultant pathologists and retrieved from hospital records, which were matched with intra-operative findings for accuracy. Post-operative care followed standardized protocols with careful documentation of complications. Data on potential risk factors, such as prior surgical history, existing comorbid conditions (including tuberculosis and malignancies), and history of hernia, were obtained through review of hospital admission records and direct patient interviews. A standardized data collection performa was used to document clinical history, operative findings, and histopathological results. The collected data were then analyzed to explore age-specific causes of intestinal obstruction. Data analysis was performed using SPSS version 26, and causes and complications were presented as frequencies and percentages. Chi-square test was applied to see the association between age groups and causes of intestinal obstruction at a p-value<0.05. This comprehensive methodological approach enabled detailed evaluation of intestinal obstruction causes and outcomes across different age groups while adhering to rigorous ethical and scientific standards.

DOI: https://doi.org/10.54393/pjhs.v6i6.2741

RESULTS

The study comprised 305 consecutive patients diagnosed with intestinal obstruction. Demographic analysis revealed a male predominance (146 patients, 47.9%), with an age distribution spanning from 18 to >60 years. Etiological analysis demonstrated tuberculosis as the leading cause of obstruction in group A, closely followed by post-operative bowel adhesions in group B. Malignant obstructions constituted another major etiological category, with various carcinomas in group D. The remaining cases were attributed to less common causes, including volvulus, hernias, and intussusception in different age groups. This distribution highlights the significant burden of both infectious and post-surgical etiologies in the four groups (Table 1).

Table 1: Patient Demographics and Baseline Information (n=66)

Causes	Young Adults (18 to 30 Years)	Middle -aged (31 -45 Years)	Old Aged (46-60 Years)	Elderly (>60 Years)
Tuberculosis	32 (35.2%)	30 (33.0%)	15 (16.5%)	14 (15.3%)
Adhesions	20 (30.3%)	22 (33.3%)	14 (21.2%)	10 (15.2%)
Rectal Carcinoma	0 (0%)	3 (7.1%)	15 (35.7%)	24 (57.1%)
Obstructed Hernia	10 (32.3%)	9 (29.0%)	6 (19.4%)	6 (19.4%)
Bands	6 (37.5%)	5 (31.3%)	3 (18.8%)	2 (12.5%)
Sigmoid Volvulus	2 (16.7%)	2 (16.7%)	4 (33.3%)	4 (33.3%)
Small Bowel Adenocarcinoma	0 (0%)	2 (15.4%)	5 (38.5%)	6 (46.1%)
Sigmoid Carcinoma	0 (0%)	1 (10.0%)	4 (40.0%)	5 (50.0%)
Descending Colon Carcinoma	0 (0%)	0 (0%)	2 (33.3%)	4 (66.7%)
Meckel's Diverticulum	4 (66.7%)	2 (33.3%)	0 (0%)	0 (0%)
Metastasis	0 (0%)	0 (0%)	1 (33.3%)	2 (66.7%)
Hirschsprung's Disease	2 (66.7%)	1 (33.3%)	0 (0%)	0 (0%)
Intussusception	2 (66.7%)	1 (33.3%)	0 (0%)	0 (0%)
Transverse Colon Carcinoma	0 (0%)	0 (0%)	1 (33.3%)	2 (66.7%)

Chi-square test: $\chi^2 = 99.07$, $p<0.001$

A statistically significant association was found between age group and causes of intestinal obstruction. Complications developed in 22 patients (7.21%), including wound infections (n=7, 2.29%), wound dehiscence (n=7, 2.29%), peritonitis (n=4, 1.31%), and burst abdomen (n=4, 1.31%). Additionally, 6 patients (1.96%) expired during the hospital stay.

DISCUSSION

This cross-sectional study provides important insights into the age-stratified etiology of intestinal obstruction in adults, revealing significant variations across different age groups that have direct clinical implications. Tuberculosis emerged as the predominant cause (35.2%) in group A (18-30 years), consistent with the high prevalence of abdominal TB in developing nations. This finding aligns with studies from similar socioeconomic settings reporting TB-related obstruction rates in young adults [19]. The significant burden of congenital anomalies (Meckel's diverticulum, Hirschsprung's, intussusception) in this group reinforces the importance of considering developmental abnormalities in young patients. Patients with peritoneal tuberculosis can develop intestinal obstruction due to the formation of adhesions, which may lead to the development of an abdominal cocoon [20]. Our study reflected adhesions as the leading factor of intestinal obstruction in group B (31-45 years). Adhesions maintained a significant contribution (33.3%), reflecting cumulative abdominal surgeries. Similar findings have been reported in other studies [9]. While tuberculosis remained prevalent (33%), we observed the emergence of malignant causes (rectal carcinoma, 7.1%, small bowel adenocarcinoma, 15.4%) in group B. In this study, causes of intestinal obstruction showed a dramatic etiological shift in group C (46-60 years), with carcinomas becoming predominant (rectal 35.7%, small bowel 38.5%, sigmoid 40%). Tuberculosis declined markedly (16.5%), while sigmoid volvulus increased (33.3%). These findings mirror Western data showing cancer-related obstruction rates of 35-45% in this age group [21, 22]. Malignancies dominated intestinal obstruction causes in group D (rectal carcinoma 57.1%, descending colon carcinoma 66.7%), consistent with global ageing populations. The persistence of volvulus (33.3%) and hernias (19.4%) highlights that mechanical causes remain relevant in elderly patients despite cancer predominance. Which are similar to findings reported in other studies [23]. Incidence of complication was 7.21% in our study, including wound infections (n=7, 2.29%), wound dehiscence (n=7, 2.29%), intestinal perforation causing peritonitis (n=4, 1.31%), and burst abdomen (n=4, 1.31%) cases. Other studies also reported complications developed after surgery, which are comparable to our study findings [17]. This prospective study benefits from histopathological confirmation, robust sample size, and detailed age stratification, providing reliable insights into obstruction etiologies and complications.

CONCLUSIONS

It was concluded that this study provides valuable insights regarding the causes of intestinal obstruction according to different age groups. These findings underscore the critical importance of age-specific diagnostic approaches in intestinal obstruction management. By recognizing of the etiological transition from tuberculosis-dominated pathology in younger adults (18–45 years) to malignancy-predominant obstruction in older populations (>45 years), has profound implications for clinical practice. Implementation of these evidence-based, age-stratified approaches could significantly improve patient care and

DOI: https://doi.org/10.54393/pjhs.v6i6.2741

resource utilization in surgical practice.

Authors Contribution

Conceptualization: HS
Methodology: HS, MS
Formal analysis: MKM
Writing review and editing: MIYKU, AS, TM

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

All the authors declare no conflict of interest.

Source of Funding

The author received no financial support for the research, authorship and/or publication of this article.

REFERENCES

[1] Griffiths S, Glancy DG. Intestinal Obstruction. Surgery (Oxford).2023Jan;41(1):47-54.doi:10.1016/j.mpsur.2022.10.013.

[2] Jatkar G, Singarwad Y, Bhuyar S, Rathod V. Study of Etiological Spectrums, Symptoms, and Management of Intestinal Obstruction Among Population in Central India. DY Patil Journal of Health Sciences. 2024 Apr; 12(2): 41-5. doi: 10.4103/DYPJ.DYPJ_40_23.

[3] Beyene E and Negassa M. Causes, management outcome, and associated factors in patients admitted with a diagnosis of intestinal obstruction to Ambo University Referral Hospital: a 3-year retrospective chart review. African Health Sciences. 2024 Jul; 24(2): 348-64. doi: 10.4314/ahs.v24i2.36.

[4] Nelms DW and Kann BR. Imaging modalities for evaluation of intestinal obstruction.Clinics in Colon and Rectal Surgery.2021Jul;34(04):205-18.doi:10.1055/s-0041-1729737.

[5] White M. Understanding the physiology of bowel obstruction and its implications for patient assessment and management.Gastrointestinal Nursing.2021Sep;19(7):18-24.doi:10.12968/gasn.2021.19.7.18.

[6] Islam MR, Habib MA, Rahman MM, Fatin J, Saha BK. Etiology of intestinal obstruction-correlation between pre-operative and perioperative findings with histopathology. SAS Journal of Surgery.2024 Jan; 10: 82-9. doi: 10.36347/sasjs.2024.v10i01.015.

[7] Dhebar F and Khan N. A hospital based observational study to evaluate the common etiological factor related to small bowel obstruction in adult patients. International Journal of Surgery Science.2023;7(2):11-14. doi: 10.33545/surgery.2023.v7.i2a.989.

[8] Ghimire P and Maharjan S. Adhesive small bowel obstruction: a review. Journal of the Nepal Medical Association.2023Apr;61(260):390.doi:10.3172 9/jnma.8134.

[9] Podda M, Khan M, Di Saverio S. Adhesive small bowel obstruction and the six w's: who, how, why, when, what, and where to diagnose and operate? Scandinavian Journal of Surgery.2021Jun;110(2):159-69. doi: 10.1177/1457496920982763.

[10] 1Sahibole AS, Farooq R, Ali HM, Bukhari SJ, Al Ozaibi LS, Ali H *et al.* Abdominal tuberculosis presenting with small bowel obstruction: a case report. Cureus. 2023 Apr; 15(4). doi: 10.7759/cureus.37459.

[11] Ladumor H, Al-Mohannadi S, Ameerudeen FS, Ladumor S, Fadl S. TB or not TB: A comprehensive review of imaging manifestations of abdominal tuberculosis and its mimics.Clinical Imaging.2021 Aug; 76: 130-43. doi: 10.1016/j.clinimag.2021.02.012.

[12] Bagcchi S. WHO's global tuberculosis report 2022. The Lancet Microbe.2023Jan;4(1):e20.doi:10.1016/S2666-5247(22)00359-7.

[13] Grigorean VT, Erchid A, Coman IS, Liţescu M. Colorectal Cancer—The "Parent" of Low Bowel Obstruction.Medicina.2023May;59(5):875.doi:10.3390/medicina59050875.

[14] Coronel J, Saltos J, Triana T. Prevalence of intestinal obstruction in patients with colon cancer: A single-center cross-sectional study. Review of Oncology European Cancer Organization.2022;32(3):300-9. doi: 10.33821/663.

[15] Mukhopadhyay D, Banerjee A, Datta S, Dutta PS. A prospective observational study on etiology and management influencing outcome in operatively managed cases of acute intestinal obstruction in adults. Asian Journal of Medical Sciences.2023Sep;14(9): 229-34. doi: 10.3126/ajms.v14i9.53329.

[16] Sudarshan V, Husain SJ, Choudhary KS, Kumar NP. A study of surgical management of intestinal obstruction. International Surgery Journal.2023 May;10(5):866-870.doi:10.18203/2349-2902 .isj20231382.

[17] de Araújo Martins-Romeo D, Domínguez AR. Complications after abdominal surgery.Radiología (English Edition).2023 Mar; 65: S99-108.doi:10.1016/j.rxeng.2022.09.012.

[18] Gohar F, Sohail S, Shaikh R. Diagnostic accuracy of computed tomography scan against surgical findings in small bowel obstruction cases. Khyber Medical University Journal. 2024 Mar; 16(1): 61-.

[19] Jena A, Mohindra R, Rana K, Neelam PB, Thakur DC, Singh H *et al.* Frequency, outcomes, and need for intervention in stricturing gastrointestinal tuberculosis: a systematic review and meta-analysis. BioMed Central Gastroenterology.2023Feb;23(1):46.doi:10.1186/s12876-023-02682-x.

[20] Shams AH, Niakan MH, Ahadi M, Rasekhinejad M, Kermani SS. Small bowel obstruction as a consequence of peritoneal tuberculosis.Bulletin of Emergency and Trauma. 2022; 10(4): 196.

[21] Shariff F, Bogach J, Guidolin K, Nadler A. Malignant bowel obstruction management over time: are we doing anything new? A current narrative review.

DOI: https://doi.org/10.54393/pjhs.v6i6.2741

Annals of Surgical Oncology. 2022 Mar: 1-1.

[22] Pavlidis ET, Galanis IN, Pavlidis TE. Management of obstructed colorectal carcinoma in an emergency setting: An update. World Journal of Gastrointestinal Oncology.2024Mar;16(3):598.doi:10.4251/wjgo.v16.i3.598.

[23] Perrone G, Giuffrida M, Papagni V, Pattonieri V, Tarasconi A, Catena F. Management of acute large bowel obstruction in elderly patients.Emergency General Surgery in Geriatrics.2021:349-60.doi:10.1007/978-3-030-62215-2_21.