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Original Research

Epidemiological and Demographic Trends in Intestinal Obstruction: A Two-Year Prospective Study at a Tertiary Care Center in Central India

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ABSTRACT

Background: Intestinal obstruction (IO) is a prevalent surgical emergency with significant morbidity, especially in developing nations. Demographic and epidemiological profiling is essential for optimizing resource allocation and early intervention strategies.

Objective: To assess age, gender, and BMI-based trends in the presentation and management outcomes of IO at a tertiary care hospital in central India.

Materials and Methods: A prospective observational study was conducted from September 2022 to March 2024, including 385 patients diagnosed with IO. Demographic data and management modalities were analyzed across age groups, gender, and BMI categories.

Results: The most affected age group was 41–60 years (61.55%). Males constituted 82.85% of the study population. Overweight individuals (BMI 25–29.9 kg/m²) formed the largest subgroup (43.1%). Surgical intervention was required in 68.05% of patients, with older age (>50 years) and BMI ≥25 kg/m² significantly associated with operative management. Conservative treatment was only effective in patients with BMI <25 kg/m².

Conclusion: Intestinal obstruction in this setting predominantly affects middle-aged, overweight males. BMI and age are key determinants of surgical intervention. These findings should guide targeted community awareness, early referral systems, and preparedness for surgical care in similar regional contexts.

Key Words: Intestinal obstruction; Age; Gender; Body Mass Index

INTRODUCTION

Intestinal obstruction (IO) is a global surgical challenge, disproportionately affecting populations in low- and middle-income countries where healthcare infrastructure may be limited. Epidemiological studies suggest wide variability in the incidence, etiology, and outcomes of IO, with significant influence from demographic, geographic, and socio-cultural factors [1,2]. Understanding regional patterns of disease presentation and treatment is crucial for tailoring health policies, improving triage strategies, and optimizing resource allocation in surgical departments.

This prospective study, conducted at a tertiary care center in central India, provides an in-depth analysis of the demographic and clinical characteristics of patients presenting with IO. The research includes 385 patients evaluated over 18 months, offering a substantial dataset reflective of real-world trends in the Indian subcontinent. The most affected age group was 40–60 years, with a notable male preponderance—findings consistent with previous regional data but requiring renewed attention in contemporary epidemiological frameworks [4].

Body mass index (BMI), duration of symptoms, and comorbidities significantly influenced the presentation and outcome of IO. Our observations highlight the predominance of overweight and obese individuals in the affected cohort, raising questions about lifestyle, dietary factors, and delayed care-seeking behavior [5]. Furthermore, the study reveals critical insights into the mode of presentation

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(operative vs conservative), correlating these with age, gender, and biochemical profiles [6].

Given the diversity of etiologies—ranging from adhesions and malignancies to hernias and volvulus—epidemiological profiling of IO is essential to identify at-risk groups and develop early warning systems. This study aims to bridge existing gaps in localized data, which are often absent in global gastrointestinal surgical research, and supports the development of customized screening and management protocols for rural and semi-urban Indian populations [7,8].

Ultimately, these findings can serve as a reference for policymakers, hospital administrators, and public health planners seeking to reduce the morbidity and economic burden associated with IO in resource-constrained settings.

MATERIAL AND METHODS

This study was conducted as a prospective observational analysis in the Department of Surgery, Shyam Shah Medical College, and associated Sanjay Gandhi Memorial Hospital, Rewa, from September 2022 to March 2024. Ethical clearance was granted by the institutional review board.

A total of 385 patients, aged 6 months to 80 years, admitted with a confirmed diagnosis of intestinal obstruction were enrolled. Cases were identified based on clinical presentation and confirmed by appropriate radiological and laboratory investigations. Patients with chronic systemic diseases (e.g., malignancy, tuberculosis, diabetes) or congenital malformations were excluded to avoid confounding factors.

Demographic data such as age, sex, and body mass index (BMI) were collected. Detailed symptomatology including duration and nature of vomiting, abdominal distension, pain, and obstipation were noted. Patients were classified based on treatment approach into operative and conservative management groups.

All laboratory and imaging diagnostics were performed using standardized institutional protocols. Hematological parameters (e.g., hemoglobin, leukocyte count), biochemical indicators (e.g., serum urea, creatinine, amylase), and radiological findings (X-ray and ultrasound) were documented.

The collected data were subjected to descriptive statistical analysis using SPSS version 21.0. Age-wise, gender-wise, and BMI-wise distributions were calculated. The proportion of patients undergoing surgical intervention versus conservative management was also compared across demographic categories to assess treatment trends.

RESULTS

The demographic analysis of 385 patients with intestinal obstruction revealed a marked concentration in the middle-aged population, with the 41–60 year age group contributing the largest proportion of cases. The distribution by gender showed a striking male predominance, and BMI analysis indicated that overweight individuals were the most affected demographic (Table 1). These patterns suggest that age, gender, and body composition are important epidemiological factors influencing the presentation of intestinal obstruction in the studied population.

Table 1: Demographic Distribution of Patients with Intestinal Obstruction

Age Group (Years)	Number of Patients	Percentage (%)
8–14	8	2.07
15–20	16	4.15
21–40	81	21.03
41–60	237	61.55
61–80	43	11.16
Gender		
Male	319	82.85
Female	66	17.15
BMI Category (kg/m²)		
Underweight (<18.5)	32	8.3
Normal (18.5–24.9)	160	41.6
Overweight (25–29.9)	166	43.1
Obese (≥30)	27	7

The relationship between age and the choice of management modality demonstrated that patients older than 50 years were more frequently managed surgically than their younger counterparts. Although the proportion of conservative management was higher in those aged 50 years or below, surgical intervention remained the dominant modality overall (Table 2). This trend implies that advancing age may be associated with more complicated or advanced forms of obstruction necessitating operative treatment.

Table 2: Comparison of Management Strategy by Age Group

Age Group	Exploratory Laprotomy (%)	Conservative (%)
≤50 years	83 (31.7%)	64 (52.0%)

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>50 years	179 (68.3%)	59 (48.0%)

When management approach was stratified by gender, both males and females showed a higher likelihood of undergoing surgical intervention. However, no statistically significant difference in the proportion of surgical versus conservative treatment was observed between genders, suggesting that sex alone may not be a decisive factor in management planning (Table 3).

Table 3: Gender-wise Distribution of Surgical and Conservative Management

Gender	Exploratory Laprotomy (n, %)	Conservative (n, %)
Male	219 (68.65%)	100 (31.35%)
Female	43 (65.15%)	23 (34.85%)

A notable finding emerged when analyzing treatment outcomes in relation to BMI. All patients with a BMI ≥25 kg/m² required surgical intervention, whereas conservative treatment was successful exclusively in those with a BMI <25 kg/m² (Table 4). This stark contrast highlights BMI as a potentially critical factor influencing both the severity and the treatment pathway of intestinal obstruction. The data support the hypothesis that increased adiposity may predispose individuals to complex obstruction types or delayed diagnosis, necessitating surgical resolution.

Table 4: BMI-wise Distribution of Surgical and Conservative Management

BMI Category	Exploratory Laprotomy (n, %)	Conservative (n, %)
< 25	69 (26.34%)	123 (100%)
≥ 25	193 (73.66%)	0 (0%)

These findings underscore the importance of demographic profiling in the clinical assessment of intestinal obstruction and offer key insights into population-specific predictors of surgical need.

DISCUSSION

Intestinal obstruction (IO) continues to pose a significant challenge to general surgeons, particularly in resource-constrained settings such as rural and semi-urban India. This prospective study provides valuable insight into the demographic and epidemiological trends of IO based on a cohort of 385 patients treated over a two-year period.

The most striking finding of our study was the age distribution. The majority of patients fell within the 41–60 year age bracket (61.55%), suggesting that middle-aged individuals are at a heightened risk for intestinal obstruction. This could be attributed to cumulative exposure to environmental risk factors, dietary habits, and higher incidence of comorbidities such as hernias, adhesions, and colorectal malignancies in this age group. These results are in agreement with similar regional studies that highlight the peak incidence of IO in middle age due to increased surgical history and occupational strain [8].

Gender distribution revealed a strong male predominance (male-to-female ratio ~5:1). This finding is consistent with earlier literature [9], which suggests men are more prone to obstruction due to higher rates of external hernias and greater physical activity, particularly in rural labor-intensive populations. The sociocultural role of women in rural settings, including delayed health-seeking behavior, may also contribute to underrepresentation in clinical data.

BMI analysis demonstrated that overweight (43.1%) and normal-weight (41.6%) individuals constituted the bulk of IO cases, with obese (7%) and underweight (8.3%) patients forming the minority. Notably, conservative management was exclusively successful in patients with BMI <25 kg/m², while all overweight and obese individuals required surgical intervention. This suggests a potential link between higher BMI and complicated obstruction, likely due to delayed recognition or higher incidence of mechanical causes such as volvulus and neoplasms [10].

Management analysis based on age, gender, and BMI revealed that older age (>50 years) and elevated BMI (≥25 kg/m²) were significantly associated with surgical intervention. Interestingly, although gender distribution in surgical vs conservative groups was not statistically significant, males remained the majority of surgical cases by volume [11-15].

These findings emphasize the need for targeted health interventions in high-risk populations—especially overweight middle-aged males. Public health education, timely referral systems, and improved access to surgical care can potentially reduce the morbidity associated with delayed intervention in IO.

CONCLUSION

This study highlights that intestinal obstruction in a central Indian tertiary care setting predominantly affects overweight, middle-aged males. Increasing age and BMI were significantly associated with the likelihood of requiring surgical intervention. These demographic insights are vital for regional healthcare planning, early triage, and risk stratification. Efforts should focus on improving awareness, timely

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diagnosis, and proactive surgical readiness, especially in rural and semi-urban populations.

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