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“An observational study of intestinal obstruction in adults”

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Abstract--Background: Mechanical intestinal obstruction is a common surgical emergency. The causes of intestinal obstruction include hernias, postoperative adhesions, malignancy, strictures etc. The etiology of this condition varies in different parts of the world and within same country. Methods: This prospective descriptive study was conducted in department of surgery at a tertiary care teaching hospital. All the adult patients, irrespective of sex with diagnosis of dynamic intestinal obstruction undergoing exploratory laparotomy were included in the study. Laparotomy findings were recorded and in the postoperative period patients were followed up for detection of complications and treatment. Results: 45 patients were treated for mechanical intestinal obstruction. Mean age was 49.5 years and male to female ratio was 1.81:1. Most common cause of small bowel obstruction is Small bowel adhesions i.e. 13 patients (39.39%) ; while the most common cause of large bowel obstruction is malignancy arising from different parts of large bowel i.e. 66.67% of patients (8 patients) Wound infection was the commonest postoperative complication. There were 12 deaths in this study giving mortality rate

of 26.6%. Conclusions: Bowel Adhesion is the leading causes of mechanical intestinal obstruction in our region. Old age, delayed presentation, associated co-morbidities, increases the morbidity and mortality in these patients.

Keywords--- Mechanical intestinal, postoperative complication, mortality rate.

Introduction

An intestinal obstruction also known as bowel obstruction is potentially serious condition in which the normal propulsion and passage of intestinal contents and product of digestion cannot occur for whatever reason . It accounts for 5% of all acute surgical admissions, 80% occurs in small bowels and 20% occurs in large bowels. The extrinsic causes include compression by external mass, adhesions bands, strangulated internal or external hernia, volvulus or intussusception.^{1,2}

Most of the patients are coming from rural area cannot get proper treatment nearer to their homes. Due to illiteracy and ignorance on the part of the patients and relatives and lack of proper and timely advice by local general practitioners, these patients referred to a well-equipped hospital after trial of prolonged treatment.³

A wave of progress has seen in recent years brought us new knowledge and understanding of aetiology, pathology and biochemistry of acute intestinal obstruction and improved techniques of treatment. As we stand at present, the concrete knowledge and proven methods have changed the prognosis from

extreme uncertainty to relative certainty and success. There is no doubt that further improvement will occur, but last three-four decades will surely be remembered as period in which the most dramatic improvement has occurred.^{4,5}

Early diagnosis of intestinal obstruction skilled operative management, proper technique during surgery and intensive post-operative treatment carries a grateful results.⁶

The purpose of this is to study the etiological factors in causation of acute intestinal obstruction. This study also envisage to analyze and illustrate the impact on the prognosis of the patient, of these factors such as time lapsed between the onset of first symptom and hospitalization, and delay in the operative treatment after admission to the hospital.

Material and Methods

It is a hospital based prospective descriptive study which has been carried out on 45 patients with acute intestinal obstruction admitted under the Department of Surgery at our institute .Figure 1 .Patients below 18 years or with subacute intestinal obstruction were excluded from the study.

 x-ray showing small bowel obstruction	 Figure showing large bowel obstruction
Figure showing sigmoid volvulus 	 Figure showing necrotizing enterocolitis
Figure 1. Radiographical and clinical characteristics of the study patients	

Observation and Results

Majority of the patients i.e. 14 (31.11%) belongs to 61-70 years age group. Table 1. Among 45 patients, 29 patients (64.44%) were males and rest were females, with male to female ratio of 1.81: 1

Age Distribution in Acute Intestinal Obstruction

Age in years	Number	Percentage
18-20	0	0
21-30	4	8.89
31-40	6	13.33
41-50	7	15.56
51-60	8	17.78
61-70	14	31.11
70 and above	6	13.33

In this study of 45 patients of acute intestinal obstruction, 33cases (73.33%) were having small bowel etiology and 12 cases (26.67%)were having large bowel etiology leading to intestinal obstruction.

Most common cause of small bowel obstruction is Small bowel adhesions i.e. 13 patients (39.39%) ; while the most common cause of large bowel obstruction is malignancy arising from different parts of large bowel i.e. 66.67% of patients (8 patients) .Table 2

Cause of Small Bowel obstruction	No. of cases n(%)	Cause of large bowel obstruction	No. of cases n(%)
Small bowel adhesions	13(39.39)	Malignancy	8(66.67)
Hernia	10(30.30)	Gangrenous large bowel	3(25)
Ileal stricture	3(9.09)	Large bowel volvulus	1(8.33)
Bands	1(3.03)		
Ileo-Ileal Intussusception	1(3.03)		

Gangrenous small bowel	3(9.09)		
Other	2(6.06)		

In our study, most common causes of small bowel adhesions were previous operative history of exploratory laparotomies in 23.07% patients (3 patients) and post abdominal hysterectomy in 23.07% patients (3 patients). Other causes were highlighted in Figure In two patients (15.38% patients) of small bowel adhesions were due to chronic inflammation because of tuberculosis which were non operable.

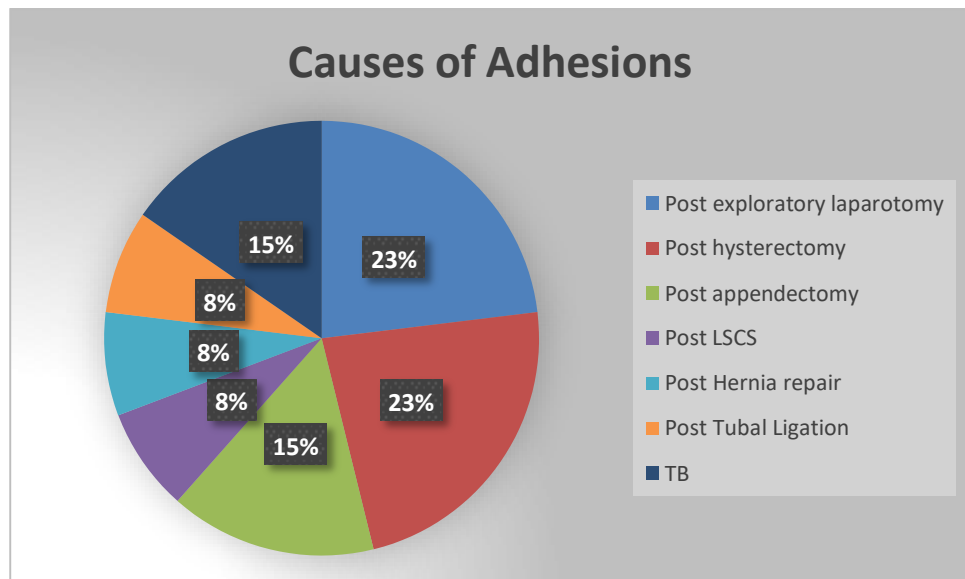


Figure 2. Causes of Adhesion

In our study, strangulated intestinal obstruction was present in 15.5% cases (7 cases) as compared with non-strangulated intestinal obstruction which was present in 84.44% cases (38 cases)

The commonest presenting symptoms among patients with acute intestinal obstruction was abdominal pain in all patients (100% patients). Other common clinical presenting symptoms were vomiting (73.3%), constipation (48.8%), distention of abdomen (26.6%) and irreducible swelling (22.2%).

Different Causes of Gangrenous Bowel (7 cases) Associated with Level and Cause of Obstruction

we had total 7 cases of gangrenous bowel obstruction. In these cases gangrenous small bowel obstruction i.e. 4 case (57.1%) was more common than gangrenous large bowel obstruction i.e. 3 cases (42.9%). Causes for gangrenous bowel obstruction were enlisted in Table 3.

We had found that abdominal tenderness was present in 100% patients. Other presenting signs were tachycardia (80%) and guarding / rigidity (75.5%), lump in abdomen (15.5%), absent bowel sounds (11.1%).

Cause	Small Intestinal Obstruction	Large Intestinal Obstruction	Total Number of Cases
Vascular Thrombosis	2	1	3
Intussusception	1	-	1
Necrotizing Enterocolitis	1	-	1
Crohn's Disease	-	1	1
Chronic Inflammation	-	1	1
Total	4	3	7

In our study mortality is markedly increased if the patient comes late after the initial symptoms started. When patient present with symptoms within 48 hours mortality is nil but as interval increases mortality increases progressively. In our study 10 patients presented within first 48 hours of appearance of symptoms of intestinal obstruction all survived. Table 4

DURATION OF SYMPTOMS	NUMBER OF CASES ADMITTED	NUMBER OF DEATH	PERCENTAGE
Day 1	5	-	0
Day 2	5	-	0
Day 3	8	2	25

Day 4	9	3	33
Day 5	8	3	37
Day6	6	2	33
Day 7 Or More	4	2	50
Total	45	12	

Mortality rate progressively increased after 48 hours of presentation of symptoms and late hospitalization.

The above observations prove that the chances of survival progressively decreased with the lapse of time between appearance of symptoms and hospitalization of patients. This lapse of time was because of ignorance on the part of patients or relatives or improper advice or inadequate medical facilities at his place of residency and inadequate transport facilities. Figure 3.

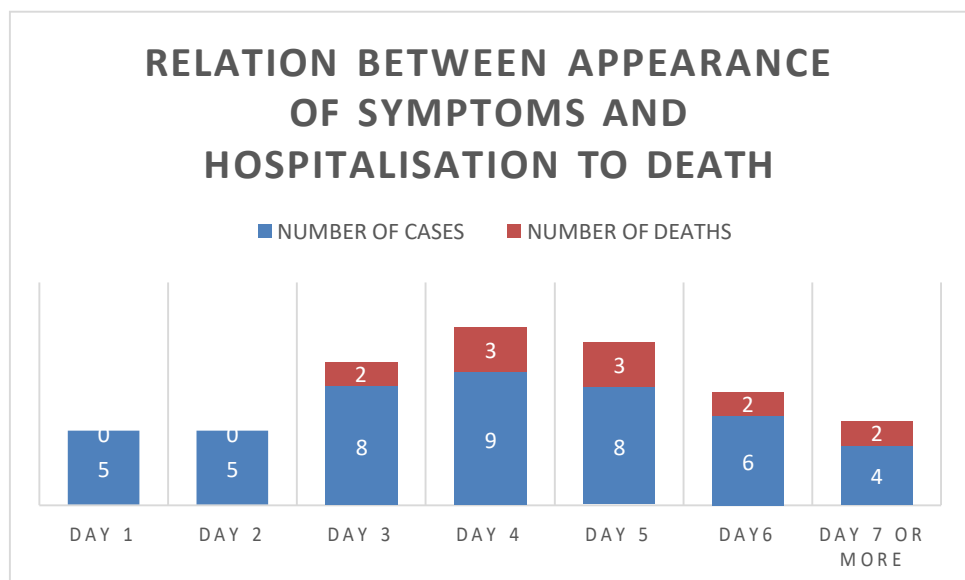


Figure 3 showing interval between appearance of symptoms and admission related mortality.

Relation In Between Treatment And Mortality

Comparing the results with mortality it is seen that mortality was least

who underwent simple procedure (Adhesiolysis, Band Ligation Stricture Release or Colostomy) 19% [6 death out of 31], while it was more in major procedure (Resections & Anastomosis) 43% [6 death out of 14].Table 5

TREATMENT	NUMBER OF CASES	NUMBER OF DEATHS	PERCENTAGE
Simple Relief Of Obstruction and Simple Procedures (Stoma And Adhesiolysis)	31	6	19
Major Procedure (Resection and Anastomosis)	14	6	43
	45	12	

Table no. 5 showing Relation between type of procedure and mortality

Incidence Of Post Operative Complications In Operated Patients With Intestinal Obstruction

In this study wound infection 26.6% (12 patients) was the most common post-operative complication. Other complications were summarized in Table 6.

COMPLICATIONS	NUMBER OF CASES
Wound Infection	12
Burst Abdomen	3
Respiratory tract infection	2

Septicemia	6
Anterior Abdominal Wall Cellulitis	1
Faecal Fistula	1
Multiple organ dysfunction syndrome	2

Table no.6 showing post-operative complications in operated patients of intestinal obstruction

Hospital Stay in acute intestinal obstruction patients

In our study of acute intestinal obstruction the average hospital stay in operated patients was 11-20 days. Average hospital stay was 12.8 days. Maximum number of days of hospitalization was 33 days and minimum are 5 days. Table 7

Hospital Stay In Days	Number Of Patients
1-10	9
11-20	14
21-30	8
31 And Above	2
Patients Expired	12

Table no. 7 showing average hospital stay in operated patients of acute intestinal obstruction

Mortality

There were 12 deaths in this study giving mortality rate of 26.6%. Causes for death were highlighted in Table 8.

Table 8. Cause of Death in Operated Patients of Acute Intestinal Obstruction

Cause of Death	Ileal Stricture	Adhesions	Vascular Thrombosis	Malignancy	Inflammatory bowel disease	Necrotizing Enterocolitis	Total
Respiratory Failure	---	---	1	---	---	---	1
MODS	---	2	---	1	---	---	3
Septicemia	---1	4	1	---	1	1	7
Total	1	6	2	1	1	1	12

Discussion

Acute intestinal obstruction in adults is one of the major surgical emergency in day to day clinical practice both by physician and surgeon. Partly the cause of this problem is ignorance on the part of patient, poor health knowledge, non-availability of medical facilities and partly ignorance of the private general practitioners, prolonged conservative line of treatment with late referral. The mortality and morbidity is still high in our country.^{1,2} The present study of 45 cases above the 18 years old patients admitted to the surgical wards with diagnosis of intestinal obstruction were taken for study.

We found ,14 patients (31.11%) in 61-70 years age group. The finding of our study were in agreement with Adhikari S et al ⁷who reported peak incidence in the age group 51-61 was 25%.

However studies by Harban Singh ⁸ and C S Ramchandra ⁹ says that maximum number of cases occur in age group of 21-40 years of these etiological factors was obstructed inguinal hernia.

The male preponderance is consistent with series reported from other parts of world. Male predominance in this study because of large number of our patients had obstructed or strangulated hernia, and in our country males having more from inguinal hernias than females. Fuzan ¹⁰ and Lee ¹¹ reported male to female ratio of 2:1.

The etiology of acute intestinal obstruction varies in different geographical locations. In the present study , small bowel obstruction contributed to 77 % and large bowel obstruction 23% to total cases. This is comparable with reports of Michel ¹² and Becker ¹³ where small bowel obstruction constituted 80% and large

bowel constituted to 20%. This is comparable with reports of Ojo EO et al ¹⁴ where small bowel obstruction constituted to 77% and large bowel obstruction 23%.

In small bowel obstruction, the most common etiological factor in the present study was adhesions, which is seen in 28.8% cases. Following table showed comparable studies for cause of intestinal obstruction

A total of 28.8 % of cases attributed to adhesions leading to acute intestinal obstruction. Similar findings noted in Jain and Prasad ¹⁵ found that adhesions contributed for intestinal obstruction upto 25.5 %.

On review of earlier Indian studies 10% of intestinal obstruction were related to adhesions and studies in 1982 reports 23%. The rises in the incidence of adhesions leading to obstruction are attributed to increase number of abdomino-pelvic surgeries. In western studies obstructions related to adhesions are in range from 40- 60%. Developing country like Virginia also reported 40% obstructions related to adhesions. ¹⁶

1.1) Hernia:-

A total number of 10 (22.2%) cases of acute intestinal obstruction are related to hernia in this study of 45 cases. Out of these 10 cases, 9 cases were obstructed hernia in male patient and one case of umbilical hernia in female patient.

The comparative analysis of incidence of various studies reported incidence from 13-35% but hernia related obstruction were higher in earlier period (60-70's) due to early surgical treatment for hernia the incidence is decreasing from 40% to 20%.

Jahangir sarwar khan ¹⁷ and Souvik Adhikari ⁷ showed similar incidence i.e, 34% and 36%. Budharaja et al ¹⁸ revealed the etiology for acute intestinal obstruction secondary to obstructed hernia accounted for 33%. Ramchandran reported 38.6% of incidence of strangulated small bowel obstruction with 21.4% of obstructed hernia in adults. ⁹

1.2) Malignancy-

In the present study of acute intestinal obstruction related to malignancy constituted for 9 (20%) cases. 3 cases were due to sigmoid carcinoma, 1 case was due to carcinoma of splenic flexure, 2 cases were due to carcinoma of caecum, 1 case was due to colorectal malignancy, 1 case was due to sigmoid volvulus due to carcinoma of rectum, 1 case was due to metastatic adhesions. Incidence is higher in the western countries due to various factors which includes increased aged population, constipation due to increased animal fat diet and lack of high fiber diet. ¹⁶

Harban et al reported an incident of 15 % large bowel obstruction. ⁸ The present study co-relates with above mentioned study. Jaffe and Thompson ¹⁹ in his series recorded the incidence of obstructing carcinoma of right colon equals 26% and left colon 69%. Ramchandran in his study found that the sigmoid colon cancer

accounted for 6.6% of intestinal obstruction.⁹

1.3) Volvulus-

Volvulus constituted for about 2.2% of cases leading to acute intestinal obstruction in our study. It was a sigmoid volvulus due to carcinoma of rectum. A study conducted by Sankaran²⁰ reported 24 cases of volvulus in south India among which sigmoid volvulus predominated forming 50% of the cases. Gill²¹ reported that incidence of volvulus was 25%

1.4) Intussusception-

In our study of 45 cases of acute intestinal obstruction 1 case was due to intussusception (2.2%).

According to study by Azart, Berger DL²² adult intussusception accounted for only 1-5 % of small bowel obstruction. Kuruvilla²³ in his series found that the incidence of intussusception was 6.3%. Ti²⁴ revealed in his study of 261 patients the incidence of intussusception accounted for 6.3% of intestinal obstruction.

1.5) Necrotizing enterocolitis-

Necrotizing enterocolitis leading acute intestinal obstruction was present in 2.2% (1 case) in our study. Necrotizing enterocolitis is rare condition in adults, exact etiology is uncertain with high mortality rate -Sannop Koshy Zachariah²⁵

1.6) Vascular thrombosis -

In our study, out of 7 case of gangrenous bowel obstruction 3 (6.6%) cases were due to mesenteric vascular thrombosis having high mortality. According to study of Adhikari S,⁷ Mesenteric vascular thrombosis accounts 9% cases of intestinal obstruction.

Chronic inflammation

In present study 2 cases were due to chronic inflammatory condition leading to acute intestinal obstruction i.e. 4.4%. According to Bizer et al²⁶ intestinal obstruction occurs 5.2% due to chronic inflammation.

2. Incidence of strangulated versus non-strangulated bowel obstruction In our study, strangulated obstruction was present in 15.5% and Non-strangulated intestinal obstruction was present in 84.44%
3. Clinical features in acute intestinal obstruction- In this study the most common presenting symptoms was Pain in abdomen 100% (45cases) .Similar finding noted in Ojo EO et al¹⁴ study and Deshmukh SN²⁷ study as our study.
- 6) Death

There were 12 deaths in this study giving mortality rate of 26.6%. Septicemia is the most common cause of death followed by multiple organ dysfunction syndrome (MODS), respiratory failure. 6 deaths occurred in patients operated for small bowel adhesions, 2 deaths occurred in patients operated for vascular thrombosis, 1 each death occurred in patients operated for ileal stricture, malignancy, IBD & NEC. Mortality were lesser in our study as compared to previous study by Goyal SK et al ²⁸(53%).

Conclusion

It can be conclude that acute intestinal obstruction is still a serious condition with high morbidity and mortality, despite of good knowledge of pathophysiology, medical and marked advances in surgical treatment. This high mortality can be reduced by good health education providing good

medical facilities to the patient's careful clinical and laboratory evaluation to differentiate and diagnose between strangulated and non-strangulated obstruction and early treatment.

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