Journal of Cardiovascular Disease Research

ISSN: 0975-3583,0976-2833 VOL13,ISSUE05,2022

CAUSES OF SMALL BOWEL OBSTRUCTION IN A TERTIARY CARE HOSPITAL IN INDORE, INDIA – AN INTERVENTIONAL STUDY

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ABSTRACTBackground. Bowel obstruction is one of the one of the common intra-abdominal problems faced by general surgeon. It may be small or large bowel obstruction. Bowel obstruction causes morbidity and mortality. Knowledge of the causes of bowel obstruction helps in the early diagnosis and treatment. The aim of this study is to know the common causes of Small bowel obstruction in a tertiary care hospital of Indore so that early treatment can be done.**Materials and Methods.**In this prospective study 200 patients of small bowel obstruction have been observed clinically, radiologically and intraoperatively to know the cause of small bowel obstruction. **Results.** In our study numbers of male patients were more than the female patients. Intra-abdominal bands and adhesions was the most common cause of Small bowel obstruction and gall stone ileus was the least common cause.**Conclusion.**Whatever may be the cause of Small bowel obstruction early diagnosis and prompt treatment is crucial in minimizing the morbidity and mortality.

Keywords. Adhesions, Adult, Aetiology, Hernia, Small bowel obstruction.

INTRODUCTION

Intestinal obstruction is one of the commonest surgical emergencies in all age groups. Intestinal obstruction is defined as the lack of the emptying of intestinal content, regardless of etiology. Small bowel obstruction is more common than large bowel obstruction, small bowel obstruction caused by a number of pathological processes. The most common cause of small bowel obstruction is intra-abdominal adhesions followed by hernias, intestinal tuberculosis, volvulus, malignancy, Crohn's disease, Gall stones, parasitic infestations. In our study intra-abdominal adhesions are the most common cause of small bowel obstruction.

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MATERIALS AND METHODS

The prospective cross – sectional study was conductedin the patients admitted to the Department of General Surgery of M.G.M. Medical College and M.Y. Hospital, Indore, Madhya Pradesh, India from October 2021 to May 2022 with a diagnosis of Small Bowel Obstruction. A total of 200 patients were enrolled.

Inclusion Criteria

1. Patients presenting with features of SBO
2. Either sex
3. Age ≥ 18yrs

Exclusion Criteria

1. Functional bowel obstruction
2. Pseudo-obstruction
3. Small Bowel Obstruction in age< 18 yrs

Written informed consent was obtained from every patient.A questionnaire was given which included age, symptoms, relevant past history, personal history and family history. Symptoms suggestive of Small Bowel Obstruction were abdominal pain, distention of abdomen, constipation (not passing motion and flatus) and vomiting. Complete clinical examination of all the patients was done. Relevant investigations were sent to the laboratory. Radiological investigations included X-ray (abdomen standing), ultrasonography of abdomen and contrast enhanced CT scan wasdonewhen indicated. Finally, one provisional diagnosis was made. When the diagnosis was sub-acute intestinal obstruction(commonly, due to bands or adhesions), patients were put under observation and conservative treatment given. When there was acute Small Bowel Obstruction, laparotomy was done after proper resuscitation of the patient. Diagnosis was confirmed by intra-operative finding.

Statistical Analysis

The detailed history, clinical features, laboratory findings, radiological findings and operative notes were recorded in a proforma. Subsequently data was compiled and statistical analysis was done in Microsoft Excel 2019.

RESULT

The mean age of the patients was 44.1 ± 14.6 years. However, the age difference between males and females was not statistically significant (p = 0.76). As per Table 1, we can see that, in the present study, Small bowel obstruction was most

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commonly found in the age group 38-48 years (23.5 %) followed by the age group 28 - 38 years (20.5 %). It was least common in the age group 68 - 70 years (3.0%). Males were more commonly affected than females.Table 2 shows that most common cause of Small bowel obstruction, in the present study, was Adhesions (36 %),mostly post-operative. In some cases, there was Small bowel obstruction due to a band attached to Meckel's diverticulum. The second most common cause was obstructed or strangulated hernia (34.5 %) which was mostly due to obstructed inguinal hernia and hence most of the patients were male. There were some cases of obstructed incisional and ventral hernia also.Other causes of Small bowel obstruction in present study was intestinal tuberculosis (20.0%), intussusceptions (4.0 %), compound volvulus (3.0%), enterolith (1.5%) and gall stone ileus (1.0%).The causes of Small bowel obstruction between males and females was not statistically significant($p = 0.45$).

Thereafter, all the patients were either managedby conservative treatment (24%) or by operative intervention (76%). Adhesions were managed by adhesiolysis.Resection of gut was done,when there was gangrene, followed by anastomosis or ileostomy. Obstructed hernia was managed by relieve of obstruction, resection of gut when there is gangrene and hernioplasty. Intestinal tuberculosis,which was mostly sub-acute obstruction, was managed conservatively unless there is complete obstruction or perforation. In adults, intussusception presents with chronic obstruction. In almost all cases there was a lead point, which was intestinal lipoma in present study. It resected and end to end anastomosis was done. In compound volvulus, all cases presented with gangrenous bowel. So, resection and anastomosis was done. Enterotomy was done for Enterolith. In gall stone ileus the causative gall stone was removed byenterotomy, followed by cholecystectomy.

Table 1 Distribution of patients with SBO according to Age and Gender

Age group (years)	**Total Male Patients (n = 124)**	**Total Female Patients (n = 76)**	**Total Patients (N = 200)**	***p* value***
18 – 28	**21 (16.9%)**	**14 (18.4%)**	**35 (17.5%)**	**0.76**
28 – 38	**29 (23.4%)**	**12 (15.8%)**	**41 (20.5%)**	
38 – 48	**30 (24.2%)**	**17 (22.4%)**	**47 (23.5%)**	
48 – 58	**21 (16.9%)**	**15 (19.7%)**	**36 (18.0%)**	

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58 – 68	**19 (15.3%)**	**16 (21.0%)**	**36 (18.0%)**	
68 – 70	**4 (3.2%)**	**2 (2.6%)**	**6 (3.0%)**	

***Chi Square test; $p < 0.05$ is statistically significant.**

Table 2 Causes of Small Bowel Obstruction in present study

Cause	Total Male Patients (n = 124)	Total Female Patients (n = 76)	Total Patients (N = 200)	*p* value*
Adhesions**	**49 (39.5%)**	**23 (30.3%)**	**72 (36%)**	**0.45**
Hernia***	**42 (33.9%)**	**27 (35.5%)**	**69 (34.5%)**	
Intestinal Tuberculosis	**22 (17.7%)**	**18 (23.7%)**	**40 (20.0%)**	
Intussusception	**5 (4.0%)**	**3 (3.9%)**	**8 (4.0%)**	
Compound Volvulus	**4 (3.2%)**	**2 (2.6%)**	**6 (3.0%)**	
Enterolith	**2 (1.6%)**	**1 (1.3%)**	**3 (1.5%)**	
Gall stone ileus	**0**	**2 (2.6%)**	**2 (1.0%)**	

***Student's paired t-test**

****Post-operative, Meckel's Diverticulum**

*****Obstructed or Strangulated**

Discussion

Causes of Small Bowel Obstruction in adult can be divided into 3 categories [1, 2].

I. Lesions Extrinsic to the Intestinal wall

- Adhesions (Figure 1 and 2)
- Hernia (Figure 3)
- Neoplastic
- Intra-abdominal abscess

II. Lesions Intrinsic to the Intestinal wall

1. Congenital -Atresia
   -Meckel's diverticulum [3]
   -Malrotation [4]
2. Inflammatory -Crohn's disease
   -Tuberculosis
3. Neoplastic
4. Traumatic -Haematoma, Stricture

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5. Miscellaneous –Intussusception
- Volvulus (Figure 4)

III. Intraluminal Obstruction
- Gall Stone
- Enterolith

According to literature,adhesions are the most common cause of Small Bowel Obstruction in developed countries [1,3,10,11,12] followed by hernia and in developing countries, hernias are the most common cause of Small Bowel Obstruction [5,6]. Contrast to this, our study shows that in patients of Indore regionadhesionsare the most common cause of Small Bowel Obstruction which may be due to the increased incidence of laparotomies and lower segment caesarian sectionsthat causes post-operative adhesions and decreased incidence of obstructed hernia because most of the uncomplicated hernias are being operated before complications develops. Present study also points intestinal tuberculosis [7, 8]as an important cause of Small Bowel Obstruction, due to high prevalence of tuberculosis in India. Small Bowel Obstruction can be diagnosed from the erect abdominal X-ray, showing dilated small bowel with multiple air fluid levels (Figure 5). Early intervention should be done to prevent gangrene of the obstructed bowel.Few cases of sub-acute obstruction, due to post-operative bands and adhesion, can be managed conservatively. If conservative treatment fails, laparotomy is the choice [9].

Conclusion

Present study shows that in Indore region of Madhya Pradesh, Adhesionsare the most common cause of Small Bowel Obstruction, followed by hernia andintestinal tuberculosis. Enterolith and gall stone ileus are the rare causes. No case of malignancy was noted in our study of causes of Small bowel obstruction.

Declarations

Ethics approval and consent to participate

All consents have been taken.

Consent for publication

Informed consent has been taken.

Availability of data and materials

Not applicable

Competing interests

The authors declare that they have no competing interests.

ISSN: 0975-3583,0976-2833 VOL13,ISSUE05,2022

Funding
Not applicable
Acknowledgements
Not applicable

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Figures

Figure 1 Adhesions

Figure 2 Adhesions

Figure 3 Obstructed Hernia

Figure 4 Volvulus

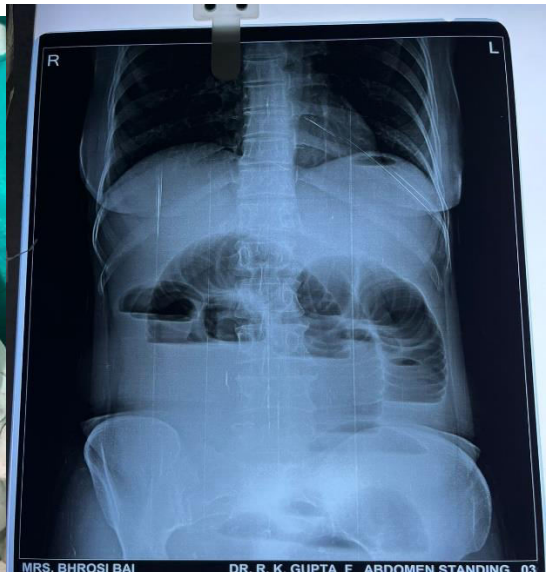

Figure 5 X-ray showing multiple air fluid levels