

## Original Research

### Incidence of small and large intestine involvement among patients presenting with intestinal obstruction: An observational study

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#### ABSTRACT:

**Background:** Intestinal obstruction is a common surgical emergency with varied etiology across different regions— adhesions are predominant in developed countries, while hernias are more common in developing nations. **Materials & methods:** This prospective study, conducted at MMMSR, Mullana over two years, included 100 patients with suspected intestinal obstruction. All underwent clinical evaluation, laboratory tests and radiographic investigations. **Results:** This study revealed a predominance of patients aged 31–40 years and a marked male predominance (66%). Small intestine was most commonly involved which included 65 percent of the patients while large intestine involvement occurred in 27 percent of the patients. In 8 percent of the patients, no definite transition zone was identified. Jejunum and ileum involvement occurred in 12 percent and 57 percent of the patients respectively, while ascending colon was involved in 6 percent of the patients. Descending colon, Sigmoid and Rectum involvement occurred in 7 percent, 12 percent and 2 percent of the patients respectively. **Conclusion:** The small intestine, particularly the ileum, was the most frequently involved segment, emphasizing the importance of focused radiological evaluation in suspected cases. However; further studies are recommended

**Key words:** Intestinal obstruction, Small intestine, Large intestine

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#### INTRODUCTION

Intestinal obstruction represents a frequent cause of emergency department visits, accounting for approximately 1.90% to 16% of all surgical admissions related to acute conditions of abdomen<sup>1-3</sup>. The hallmark clinical manifestations of intestinal obstruction include pain in abdomen, distension, vomiting and constipation.<sup>4</sup> The etiology of intestinal obstruction exhibits considerable geographic variation, not only between different countries but also among different regions within the same country. In Western nations, adhesive bowel obstruction has emerged as the predominant cause since the late 20th

century. Conversely, incarcerated or obstructed hernias remain the leading cause in developing countries. Technological advancements in diagnostic imaging, surgical interventions, and postoperative critical care have substantially reduced intestinal obstruction related mortality from 60% to below 10% over the past century; however, outcomes continue to vary significantly based on patient age and the underlying cause.<sup>5, 6</sup> The clinical presentation generally includes nausea, emesis, colicky abdominal pain, and cessation of passage of flatus and stool, although the severity of these clinical symptoms varies based on the acuity and anatomic level of

obstruction. Abdominal distension, tympanic note on percussion, and high-pitched bowel sounds are classic findings. Laboratory evaluation should include a complete blood count, metabolic panel, and serum lactate level. Imaging with abdominal radiography or computed tomography can confirm the diagnosis and assist in decision making for therapeutic planning. Management of uncomplicated obstructions includes intravenous fluid resuscitation with correction of metabolic derangements, nasogastric decompression, and bowel rest. Patients with fever and leukocytosis should receive antibiotic coverage against gram-negative organisms and anaerobes. Evidence of vascular compromise or perforation, or failure to resolve with adequate conservative management is an indication for surgical intervention.<sup>7-9</sup> Hence; the present study was conducted for assessing incidence of small and large intestine involvement among patients presenting with intestinal obstruction.

**MATERIALS & METHODS**

The present prospective study was conducted in the Department of Radiodiagnosis at Maharishi Markandeshwar Institute of Medical Sciences and Research, Mullana, Ambala,. A total of 100 patients were enrolled, all of whom presented with clinical or conventional radiographic evidence suggestive of intestinal obstruction and were referred to the radiodiagnosis department for a CT scan. Inclusion criteria comprised patients with either clinical suspicion or radiographic indications of intestinal obstruction. The scanning protocol involved routine pre-scan evaluation including detailed clinical history and laboratory investigations such as hemoglobin (Hb), total leukocyte count (TLC), and differential leukocyte count (DLC). Additionally, an erect abdominal X-ray was obtained prior to CT scanning. Site of involved of intestinal obstruction was assessed radiographically. For data analysis, all observations were entered into a Microsoft Excel spreadsheet and analyzed using the Statistical Package for the Social Sciences (SPSS) software. Descriptive statistics were expressed as mean and standard deviation, and results were visually represented using charts and diagrams.

**RESULTS**

A prospective study of 100 patients was conducted to evaluate the role of MDCT in patients with clinical suspicion of intestinal obstruction and comparison of MDCT findings with intra operative findings was done. Mean age of the patients was 45.9 years. 66 percent of the patients were males while 34 percent were females. More than one symptom was present in many patients. Pain abdomen was the most common symptom seen in 95 percent patients. Small intestine was most commonly involved which included 65 percent of the patients while large intestine involvement occurred in 27 percent of the patients. In 8 percent of the patients, no definite transition zone was identified. Jejunum and ileum involvement

occurred in 12 percent and 57 percent of the patients respectively, while ascending colon was involved in 6 percent of the patients. Descending colon, Sigmoid and Rectum involvement occurred in 7 percent, 12 percent and 2 percent of the patients respectively.

Table 1: Clinical Features in patients with intestinal obstruction

Clinical Features	Number	Percentage
<b>Pain abdomen</b>	95	95
<b>Constipation</b>	78	78
<b>Nausea and Vomiting</b>	66	66
<b>Guarding</b>	57	57
<b>Others</b>	12	12

Table 2: Distribution of patients according to type of obstruction

Type of obstruction	Number	Percentage
<b>Acute intestinal obstruction</b>	76	76
<b>Subacute intestinal obstruction</b>	24	24
<b>Total</b>	100	100

Table 3: Distribution of patients according to site of obstruction

Site	Number	Percentage
<b>Small Intestine</b> Jejunum	12	12
Ileum	53	53
<b>Large Intestine</b> Ascending colon	6	6
Descending colon	7	7
Sigmoid	12	12
Rectum	2	2
<b>Transition zone not identified</b>	8	8

**DISCUSSION**

The clinical identification and therapeutic approach to intestinal obstruction have historical roots in Hippocratic medicine. Currently, the predominant causes include intraperitoneal adhesions, external herniations, and abdominal malignancies. Small bowel obstruction (SBO) commonly arises from postoperative adhesive bands, incarcerated hernias, and neoplastic lesions such as carcinoid tumors, lymphomas, and primary adenocarcinomas, as well as from conditions like peritoneal carcinomatosis, appendiceal inflammation, radiation-induced enteritis, and intussusception.<sup>8-10</sup> In contrast, large bowel obstruction (LBO) is more frequently linked to colorectal neoplasia, impacted fecal material, diverticulosis-associated strictures, and torsional events involving the sigmoid or cecal regions. Upon clinical suspicion of SBO, a meticulous abdominal examination should be prioritized, followed by appropriate radiological assessments, which are pivotal in delineating the site, extent, and underlying etiology of the obstruction.<sup>11-13</sup>

In the present study, mean age was 45.9 years. A similar research performed by Baid G et al, mean age taken was 51.62 years.<sup>13</sup> There was a male

predominance with 66 percent of individuals being males and remaining were females. Similar to our research, Raja WM<sup>14</sup> et al in their research reported that 62 percent were males and remaining were females. In a research performed by Gupta R et al, 68 percent of the patients were males.<sup>12</sup> In our study the clinical history revealed that most of the patients presented with pain abdomen (95 percent), followed by constipation (78 percent) and abdominal distension (73 percent). Nausea/vomiting, abdominal tenderness and guarding were seen in 66 percent, 62 percent and 57 percent of patients respectively. In a similar study conducted by Raja WM et al, pain abdomen, constipation, abdominal distension, nausea/vomiting, abdominal tenderness and guarding were seen in 94 percent, 72 percent, 68 percent, 62 percent, 68 percent and 60 percent of patients respectively.<sup>14</sup> Mohi et al, in another research reported that abdominal pain was observed in all patients with suspected clinical obstruction (100%). vomiting and abdominal guarding was observed in 73 percent cases.<sup>15</sup> Baid G et al, in a similar study reported pain abdomen, vomiting, constipation, and guarding in 94 percent, 62 percent, 76 percent and 68 percent of patients respectively.<sup>13</sup> In our study, Acute intestinal obstruction was observed in 76% of patients while Subacute intestinal obstruction was seen in 24%. Similar to our study, Mohi JK et al reported acute intestinal obstruction in 71.93 percent of the patients while subacute intestinal obstruction in 28.07 patients.<sup>15</sup> In similar research performed by Gupta R et al, small and large bowel obstruction occurred in 78% & 22% of cases respectively.<sup>12</sup> Singh A et al, in a similar study reported small bowel obstruction was seen in 75% of patients.<sup>16</sup> Similar findings were reported by previous authors.<sup>17-20</sup>

Jejunum and ileal obstruction occurred in 12 percent and 57 percent of the patients while cecum & ascending colon were obstructed in 6% of patients. Descending colon, sigmoid and rectum were obstructed in 7 percent 12 percent and 2 percent of the patients. In a similar study conducted by Singh A et al, ileum was the most common site of obstruction (52.5%). In their study, jejunum and duodenum were the site of obstruction in 10% and 4% of patients while colon and rectosigmoid region were the site of obstruction in 17.5% & 7.5% of patients.<sup>16</sup> Suri S et al reported that most common site of obstruction in their study was ileum.<sup>20</sup> Sekhon et al, in another previous study reported that ileum was obstructed in 67.5 percent of the patients while jejunum was the site of obstruction in 15 percent of the patients. They reported rectosigmoid region as the site of obstruction in 5 percent of the patients.<sup>21</sup> In another research by Narayana et al, authors reported that small bowel obstruction was observed in 30 patients (75%) with ileum being predominant site of obstruction in 22%. Jejunal obstruction was reported in 4 patients (10 percent and obstruction at the level of the ileocaecal junction was observed in 2 patients (5%). 10 patients

(25%) had large bowel obstruction with sigmoid colon obstruction as the predominant site in 5 patients (13%). Caecum/ ascending/transverse/descending colon was the site of obstruction in 3 patients (7%). Rectum and recto-sigmoid was the site of obstruction in 2 (5%) patients.<sup>21</sup>

## CONCLUSION

The small intestine, particularly the ileum, was the most frequently involved segment, emphasizing the importance of focused radiological evaluation in suspected cases. However; further studies are recommended.

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