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Clinical Characteristics of Bowel Obstruction in Southern Iran; Results of a Single Center Experience

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ABSTRACT

Objective: To determine the epidemiological, clinical, laboratory characteristics as well as outcome of 411 patients with bowel obstruction in Southern Iran.
Methods: This was a cross-sectional study being performed in Shahid Faghihi hospital of Shiraz between 2006 and 2012. We reviewed the medical charts of the 411 patients with initial diagnosis of bowel obstruction who were admitted to our center during the study period. The patients' demographic, clinical and laboratory findings as well as their management and outcome was recorded in data gathering forms. The data were then analyzed according to the outcome and clinical characteristics.
Results: Among the 411 patients with initial diagnosis of bowel obstruction, 253 (61.5%) were men and 158 (38.5%) were women. The mean age of the patients was 48.2±19.7 years. Besides, 73.6% were observed and 26.4% were operated. Those who were operated had those who underwent operation had significantly lower frequency of obstipation (28.1% *vs.* 71.9%; p=0.045) and abdominal distention (32.3% *vs.* 67.7%; p=0.007). Intraoperative findings included adhesion band formation in 50 (48.1%), mass 18 (17.3%), and hernia 7 (6.7%). We found that the frequency of malignancy was significantly higher in those who were managed conservatively compared to those undergoing operation (64.3% *vs.* 35.7%; p=0.042). The mean hospital stay was significantly higher in those who underwent operation (8.1±7.5 *vs.* 2.6±2.2 days; p=0.035).
Conclusion: The results of this study demonstrates although some signs and symptoms, such as abdominal pain, vomiting, abdominal tenderness, abdominal distention, and obstipation, were more common among the patients with bowel obstruction, they were not sensitive and specific enough for definite diagnosis. Due to the lack of positive predictive value of clinical signs and symptoms in diagnosis of bowel obstruction, a reasonable and logical modality is needed for bowel obstruction diagnosis with better accuracy.

Keywords: Bowel obstruction; Clinical presentation; Characteristics; Laparatomy; Malignancy.

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Introduction

Bowel obstruction is defined as any mechanical and functional obstruction of the small or large bowel which prevents intestinal contents from passing through the intestine [1,2]. Bowel obstruction comprises more than 3% of surgical emergencies [3-6], and is one of the major causes of morbidity and

financial resources usage [2-7]. Strangulation during obstruction causes intestinal ischemia and necrosis and finally perforation of intestine. Due to these life-threatening complications, this disorder demands prompt diagnostic and therapeutic procedures [2]. The clinical signs and symptoms which could be helpful in diagnosis of bowel obstruction are usually abdominal pain, vomiting, abdominal distention, and absence of flatus or feces passage [2]. Moreover, age, co-morbidity, and delay in diagnosis and treatment of bowel obstruction are among the factors that have a significant role in mortality and morbidity in this group of patients [8].

Bowel obstruction may occur in both small and large intestines. However, obstruction in the small bowel is more prevalent [2]. The major causes of obstruction are adherence, hernia, and malignancies, which are more prevalent compared to other causes, such as Crohn's disease, gall stones, volvulus, and intussusceptions [2,3,8]. Adhesion is one of the most common complications of surgery [7-10] and on the whole, it is the most prevalent cause of obstruction [2-4,10]. This is quite logical due to the high rate of abdominal and pelvic surgeries [7]. Among the important surgeries that cause adhesion, appendectomy, female reproductive system operations, cholecystectomy, and intestinal resection due to malignancy are the most noticeable ones [2]. Neoplastic and non-neoplastic causes, including colorectal carcinoma, obstructive colitis, diverticulitis, Inflammatory Bowel Disease (IBD), and volvulus, have been mentioned as the causes of large bowel obstruction [11,12]. Besides, malignancies are among the most important causes of bowel obstruction and bowel obstruction is a common finding in malignancies, especially with gastrointestinal and female reproductive system origins [1].

Considering the importance of bowel obstruction and its life-threatening complications, learning about the epidemiological characteristics of the disease and determining its prevalence can be effective in management of this disease and providing essential sources for its early diagnosis. Due to the lack of information about the accuracy of signs, symptoms, and major causes and also considering the fact that Faghihi hospital of Shiraz is a referral center in southern Iran, the present study aims to determine the most important and frequent causes, the accuracy of various signs and symptoms, and other epidemiological characteristics of bowel obstruction.

Materials and Methods

Study Population

This cross-sectional, hospital-based study was conducted in Shiraz, Sothern Iran during a 6-year period. We included 411 patients with initial diagnosis of bowel obstruction being admitted to the emergency department of Shahid Faghihi hospital, a tertiary healthcare center affiliated with Shiraz University of Medical Sciences between March 2006 and September 2012. The clinical diagnosis of the bowel obstruction was based on the clinical and laboratory findings based on the attending general surgeon suspicion. We excluded those patients who had incomplete medical chart information and those who had several diagnoses. The study protocol was approved by the institutional review board (IRB) and medical ethics committee of Shiraz University of Medical Sciences. As this was a retrospective study dealing with patients' medical charts, no informed written consent were required.

Study Protocol

All the patients with initial diagnoses of bowel obstruction according to ICD-9 Code: 560 (ICD-10: K56) during the study period were recruited. The medical records were reviewed meticulously and the findings were recorded in a standard data gathering form. Demographic information including age and sex; signs and symptoms including abdominal pain, vomiting, abdominal tenderness, distention, and absence of flatus or feces passage were noted in each patient's data form. Their past medical history and co-morbidity, preoperative diagnosis, postoperative diagnosis, kind of operation, findings in operation, complications, diagnosis modalities, and length of hospital stay were also considered. In the past medical history, the focus was on the conditions which could be related to secondary bowel obstruction, but all the significant problems were taken into account. Some patients who had come with one or more signs and symptoms mentioned above were observed for less than 24 hours and were discharged after relieving of symptoms.

Statistical Analysis

All the data were entered into a computer database and were further analyzed using statistical package for social sciences (SPSS Inc., Chicago, USA) version 18.0. The data are presented as mean±SD and proportions as appropriate. Those who underwent surgery and those who were managed conservatively were further compared in demographic and clinical characteristics. For comparison between groups independent t-test was used for parametric data while chi-square was used to compare the proportions. In addition, the most common findings were determined and the frequency of each of these finding was studied in specific age groups. A two-sided p value of less than 0.05 was considered statistically significant.

Results

Among the 411 patients with initial diagnosis of bowel obstruction, 253 (61.5%) were men and 158 (38.5%) were women, with female to male ratio of 1 to 1.60. The mean age of the patients was 48.2±19.7 (ranging from 15 to 85) years. Regarding the treatment option, 301 (73.6%) patients were managed conservatively and 108 (26.4%) underwent surgery. Table 1 summarizes all the clinical characteristics of 411 patients with bowel obstruction included in this study.

Table 2 compares the frequency of clinical signs and

Table 1. Baseline and clinical characteristics of 411 patients with bowel obstruction admitted to our center between 2006 and 2012

Variable	Value
Age (years)	48.2±19.7
Sex	
Men (%)	253 (61.5%)
Women (%)	158 (38.5%)
Sign and Symptoms	
Abdominal pain (%)	390 (94.9%)
Obstipation (%)	323 (78.7%)
Vomiting (%)	314 (76.5%)
Abdominal tenderness (%)	239 (58.3%)
Distention (%)	193 (47.1%)
Treatment	
Conservative (%)	302 (73.5%)
Operation (%)	109 (26.5%)
Hospital stay (days)	4.12±5.04

Table 2. The frequency of clinical signs and symptoms as well as past medical history of bowel obstruction in those who underwent operation and those who were managed conservatively

	Operation (n=109)	Conservative (n=302)	*p* value
Abdominal pain (%)	102 (26.4%)	284 (73.6%)	0.453
Vomiting (%)	83 (26.6%)	229 (73.4%)	0.641
Abdominal tenderness (%)	66 (27.7%)	172 (72.3%)	0.352
Distention (%)	62 (32.3%)	130 (67.7%)	0.007
Obstipation (%)	90 (28.1%)	230 (71.9%)	0.045
Hernia (%)	5 (25%)	15 (75%)	0.891
Malignancy (%)	25 (35.7%)	45 (64.3%)	0.042
Previous surgery (%)	55 (24.6%)	168 (75.4%)	0.434
Hospital stay (days)	8.1±7.5	2.6±2.2	0.035

symptoms of bowel obstruction between those who were operated and those who were manages conservatively. Those who were operated had those who underwent operation had significantly lower frequency of obstipation (28.1% *vs.* 71.9%; p=0.045) and abdominal distention (32.3% *vs.* 67.7%; p=0.007). Intraoperative findings included adhesion band formation in 50 (48.1%), mass 18 (17.3%), and hernia 7 (6.7%). The frequancy of hernia, malignancy, and previous surgery, as past medical histories, in operated and observed patients has been shown in Table 2. We found that the frequency of malignancy was significantly higher in those who were managed conservatively compared to those undergoing operation (64.3% *vs.* 35.7%; p=0.042). The mean hospital stay was significantly higher in those who underwent operation (8.1±7.5 *vs.* 2.6±2.2 days; p=0.035).

The frequency of each of the above-mentioned past medical histories in specific age and sex groupshas been presented in Table 3. According to this table, the chance of hernia was more in those older than 70 years of age in both genders. Additionally, the chance of malignancy was higher in those between 50 and 60 years of age in both genders. In the same way, the highest frequency of previous surgery was in 30-40 years age group in men and in 60-70 year age group in women. The frequency of adhesion band was higher in 50-60 year ages in men

Table 3. Frequency of past medical histories and operation findings in specific age and gender groups among 411 patient with bowel obstruction

Age groups	Hernia (as past medical history)		Hernia (as finding)		Malignancy		Adhesion band		Mass		Previous surgery	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
10-20	0	0	0	0	0	0	2	1	1	0	9	4
20-30	0	0	0	0	1	3	7	1	1	0	17	9
30-40	2	1	0	0	3	1	4	1	0	0	25	8
40-50	1	1	0	0	8	7	2	4	4	0	16	13
50-60	2	0	1	1	14	9	6	4	2	1	21	17
60-70	2	1	0	1	8	4	4	7	2	0	13	21
70-80	3	2	3	0	5	5	5	2	1	3	23	13
>80	3	2	1	0	2	0	0	0	2	1	8	5

and in 60-70 year age group in women. The prevalence of malignancy was higher in 40-50 year age group in men and in 70-80 year age group in women.

Discussion

Acute bowel obstruction due to mechanical factors is among the most common surgical emergencies being encountered frequently in emergency department [13,14]. This problem leads to high number of hospital admissions and high economic burden [15,16]. Determination of demographic and clinical characteristics of the bowel obstruction will help better understanding of the course of the disease which will help us in better managing and evaluating these patients. Thus in this study we tried to determine the characteristics of small bowel obstruction in a large series of the patients. We found that among the 411 patients with initial diagnosis of bowel obstruction, 253 (61.5%) were men and 158 (38.5%) were women. The mean age at the time of presentation was 48.2±19.7 years. Besides, 73.6% were observed and 26.4% were operated. Among the patients who underwent operation, the most common findings were adhesion band (46.7%), mass (16.2%), and hernia (6.5%).

Similar to the previous studies [2], the findings of the present study showed that signs and symptoms, including abdominal pain, vomiting, abdominal tenderness, distention, and obstipation, were the common presenting symptoms among the patients with bowel obstruction. Markogiannakis et al. reported that absence of passage of flatus and/or feces were the most frequent presenting symptoms and abdominal distension was the most common physical finding on clinical examination. Additionally, vomiting, nausea, colicky abdominal pain, and abdominal discomfort were frequent symptoms on arrival. These results, even though some differences are noticed, are in accordance with the literature [17-21]. Particularly, Cheadle *et al*., [17] reported abdominal pain (92%), vomiting (82%), abdominal tenderness (64%), and distention (59%) as the most frequent symptoms and signs, whereas abdominal distension, bilious vomiting, absolute constipation and abdominal pain were the main signs and symptoms in another series [18]. Perea *et al*., [19] prospectively studied 100 patients with adhesive small bowel obstruction and found that the presenting symptoms were vomiting (77%), colicky abdominal pain (68%), absence of passage of flatus and/or feces (52%), and constant pain (12%), whereas abdominal distension constituted the most frequent clinical sign with a prevalence of 56%. In a study of patients with bowel obstruction due to large bowel volvulus, the most common sign of sigmoid volvulus was distension (79%) and the most frequent symptoms were pain (58%) and obstipation (55%), whereas most patients with cecal volvulus presented with pain (89%) [20]. Furthermore, in a review of cases with obstruction because of small and large bowel intussusception, abdominal pain, nausea, vomiting, and abdominal distension were the commonest symptoms and signs, respectively [21].

According to our study, these signs and symptoms did not have equal accuracy for diagnosis of bowel obstruction. It is assumed that abdominal distention and absence of gas passing and feces have higher accuracy in comparison to abdominal pain and vomiting. Among the patients who had all these signs and symptoms, only 33.3% underwent surgery with definite diagnosis of bowel obstruction and 66.7% were observed. In concordance with other studies [2,3,7], the most important findings in the patients who underwent surgery due to bowel obstruction in this study were adhesion band, mass, and hernia. Other less common causes of obstruction reported in the literature are Crohn's disease[14,22,23] and gallstones [24], accounting for 3-7% and 2% of small bowel obstruction cases, respectively, and bowel volvulus [14,15,20,24] and intussusception [23,25,26], accounting for 4-15% and 4-8% of total obstruction cases, respectively.

In the present study, only 24.6% of the patients with positive history of previous surgery on abdomen underwent operation, whereas 28.1% of the patients without previous history of abdominal surgery had operation with definite diagnosis of bowel obstruction. It should be considered that many of the patients without history of previous abdominal surgery who were not operated were referred for colonoscopy, barium enema, or CT scan and, based on the results, they might be operated as elective cases. In the current study, the highest percentage of operation was related to 70-80 years age groups among males and to 50-60 years age groups among females. Therefore, it can be concluded that although the rate of bowel obstruction was higher in males, females with bowel obstruction would undergo surgery in lower ages.

In conclusion, the results of this study demonstrates although some signs and symptoms, such as abdominal pain, vomiting, abdominal tenderness, abdominal distention, and obstipation, were more common among the patients with bowel obstruction, they were not sensitive and specific enough for definite diagnosis. On the other hand, it seems that among the past medical histories which can be related to further bowel obstruction, previous abdominal surgery and malignancy had a significant role. Malignancy not only is a leading cause of bowel obstruction, but it also predicts a higher possibility of need for surgical intervention. Due to the lack of positive predictive value of clinical signs and symptoms in diagnosis of bowel obstruction, a reasonable and logical modality is needed for bowel obstruction diagnosis with better accuracy.

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