Shiraz E-Med J. 2018 February; 19(2):e62899. doi: 10.5812/semj.62899.

Published online 2018 January 10. **Research Article**

Pain Intensity and Difficulty of Colonoscopy in Patients with Irritable Bowel Syndrome Compared to Patients with Other Diagnoses

Fardad Ejtehadi,[1,2] Khatere Mirzad Jahromi,[3] Alireza Rahimi,[2] Ladan Aminlari,[2] and Maryam Moini[2,*]

[1]Department of Internal Medicine, Gastroenterology and Hepatology Section, School of Medicine, Shiraz University of Medical Sciences, Shiraz, IR Iran
[2]Gastroenterohepatology Research Center, School of Medicine, Shiraz University of Medical Sciences, Shiraz, IR Iran
[3]Department of Internal Medicine, School of Medicine, Shiraz University of Medical Sciences, Shiraz, IR Iran

[*]*Corresponding author*: Maryam Moini, Gastroenterohepatology Research Center, Shiraz University of Medical Sciences, Shiraz, IR Iran. E-mail: dornam@hotmail.com

Received 2017 October 15; **Revised** 2017 November 09; **Accepted** 2017 December 02.

Abstract

Background: Irritable bowel syndrome (IBS) is one of the most common functional disorders of gastrointestinal system. The diagnosis of IBS is made by ROME criteria while excluding other organic causes of symptoms. The presence of alarming sings warrants further evaluation by radiologic or endoscopic studies. It is a common belief among gastroenterologists that colonoscopy in the IBS patients (compared to other patients) is more difficult for the colonoscopists and more painful for the patients. The present study aimed at evaluating the difficulty of colonoscopy, intensity of pain sensation, quality of bowel preparation, and other related findings in the IBS patients compared to non-IBS patients.

Methods: This study was conducted during January and May 2016 in a single referral academic colonoscopy center in Shiraz University of Medical Sciences on referring adult patients who were classified into 2 groups, IBS and non-IBS. Duration of procedure, quality of colon preparation, severity of pain, and difficulty of the procedure assessed by Visual Analogue Scale (VAS) were the main assessed parameters. Statistical analysis was performed by SPSS software Version No.16, and independent t test was used to compare the means.

Results: In this study, 172 patients (59 males and 113 females) were enrolled and allocated into 2 groups, IBS: 72, non-IBS:100. The mean age in IBS and non-IBS groups was 43.4 and 46.6 years, respectively. Although IBS patients had a more statistically significant pain sensation than non-IBS patients during the procedure (5 vs. 4.4 in VAS, P = 0.03), the quality of colon preparation and difficulty of the procedure revealed no significant differences (7.5 vs. 7.2, P = 0.23; and 4.7 vs. 4.8 in VAS, P = 0.6, respectively). The duration of procedure was significantly lower in the IBS group (13.1 vs. 14.1 minutes, P = 0.006), while the success rate for cecal intubation was similar in both groups (97% vs. 95%, P = 0.7).

Conclusions: Our results showed that IBS patients had more pain sensation during the colonoscopy, but the procedure itself was not more difficult in this group of patients. Finally, with a similar success rate the duration of colonoscopy was shorter in IBS patients.

Keywords: Irritable Bowel Syndrome, Colonoscopy, Colon Preparation

1. Background

Irritable bowel syndrome (IBS) is one of the most common functional disorders of gastrointestinal (GI) system, with a chronic disturbing character but non-life threatening nature (1). It is estimated that the prevalence of IBS is between 10% and 25%, with significant geographical variation (2).

The first helpful diagnostic criteria for IBS were developed in 1978 (3). ROME criteria were developed in 1989, and Rome IV criteria were recently substituted for the previously used ROME III criteria (4).

Although these criteria are useful in the diagnosis of IBS patients, the diagnosis should be made via exclusion of other diseases. Patients with warning signs such as older age (5), anemia, weight loss, elevated ESR titer, positive stool test for occult blood, history of overt fresh rectal bleeding, or history of nocturnal or progressive pain should undergo further evaluation by radiology imaging (6) and/or colonoscopy study.

One of the pathophysiologic theories for description of pain in the IBS patients is visceral hypersensitivity, which means an increase in pain sensation by colon distention (hyperalgesia) (7).

Although female gender, low body mass index, older age, patient's pain during the procedure, and inadequate bowel preparation are among factors that make a colonoscopy difficult (8), there is also a common belief among most gastroenterologists that colonoscopy is more

difficult and more painful in IBS patients. However, a few studies have been conducted to evaluate these beliefs (9, 10). Thus, the present study aimed at evaluating the intensity of pain, quality of bowel preparation, duration of the procedure, technical difficulty, and success rate of colonoscopy in IBS patients compared to those without IBS.

2. Methods

The study was designed to evaluate 5 major parameters in IBS patients during colonoscopy procedure and compare them with those of non-IBS patients; the parameters were pain severity, quality of colon preparation, duration of the procedure, technical difficulty of the procedure, and the success rate of the colonoscopy (cecal intubation).

During January and May 2016, adult patients who referred for colonoscopy to one academic centre in Shiraz University of Medical Sciences enrolled in this study and were categorized into IBS and non- IBS groups.

All IBS patients, for whom colonoscopy was requested to rule out the presence of any organic disease, fulfilled the ROME III criteria. This study was conducted before the implication of the new update release of ROME IV criteria.

Exclusion criteria for both groups were as follow: history of bowel surgery and altered GI anatomy; renal failure, which influences the amount of water consumption; current hospital admission or bed ridden/wheelchair bound condition, which limits the mobility of the patient; and confirmed diagnosis of colonic hypomotility disorders.

Colonoscopy procedures were conducted by 3 qualified attending gastroenterologists.

Demographic data were collected from the questionnaires. All patients had bowel preparation according to the standard protocol, which included polyethylene glycol bowel preparation powder, syrup of Senna, and bisacodyl tablets.

Duration of the procedure, time to pass the splenic flexure, time to reach the cecum, and successful intubation of terminal ileum were recorded.

Among the different bowel preparation scoring systems such as Aronchick BPS, Ottawa BPS, Boston BPS (11), and Chicago BPS (12), Boston bowel preparation scoring system (BPS) was selected as a practical and appreciable scoring system (11) for evaluation of the quality of bowel preparation in this study. The patient's pain sensation during the colonoscopy was measured by visual analogue scale (VAS), which is a 10 cm horizontal line with 2 anchors at each end with the words "No pain" and "Very severe pain". Sedation was administered as needed using slow intravenous administration of midazolam with maximum dose of 2.5 mg.

The success of colonoscopy was evaluated based on a 6-point scoring. Score 1 was assigned to the left colon and 2 to the splenic flexure, 3 to the transverse colon, 4 to the right colon, 5 to the cecum, and 6 to the terminal ileum.

To objectively assess the difficulty of the colonoscopy for the colonoscopists, we used the visual analogue scale (VAS), with one end "very easy" and the other end "very difficult".

Statistical analyses were conducted using statistical package for social sciences (SPSS, Chicago, IL, USA) release 16.0 for Windows. Independent t test was used to compare means and chi squared test was used for categorical variables. All P value levels less than 0.05 were considered as significant.

3. Results

A total number of 172 (59 male and 113 female) patients (Table 1) were included in this study. Patients were classified into 2 groups: IBS (n = 72) and non-IBS (n = 100). The mean age in IBS and non-IBS group was 43.4 and 46.6 years, respectively, and the mean weight was 68.9 and 67.8 kg, respectively. No significant difference was found in the means of age and weight between the 2 groups (P = 0.1 and 0.48, respectively).

The main indications for colonoscopy in both IBS and non-IBS groups are listed in Table 2.

The mean pain sensation score measured by VAS was higher in IBS patients. The mean VAS was 5 $\pm$ 1.98 in IBS group and 4.4 $\pm$ 1.88 in non-IBS group, with a statistically significant difference (P = 0.032).

A total of 37 (51%) patients in IBS group and 68 (68%) in non-IBS group received 2.5 mg midazolam intravenously for sedation (P = 0.028). The demand for sedation was similar in male patients in both groups (19 (54%) and 13 (54%) patients (P = 0.9)). Of all female patients, 18 (48%) in IBS group and 55 (72%) in non-IBS group received sedation, with a significant difference (P = 0.013).

The quality of bowel preparation, which was measured by Boston BPS, showed no statistically significant difference in the 2 groups. The mean score was 7.5 $\pm$ 1.67 in IBS group and 7.2 $\pm$ 1.76 in non-IBS group (P = 0.239).

The mean VAS score for technical difficulty of procedure was 4.72 $\pm$ 1.54 in IBS group and 4.84 $\pm$ 1.45 in non-IBS group and showed no significant difference (P = 0.61).

The duration of the procedure was significantly shorter in the IBS group (13.1 minutes $\pm$ 2.6) compared to non-IBS group (14.1 minutes $\pm$ 2.2), with a P value of 0.006.

Finally, we found that the success rate of the colonoscopy (cecal intubation) showed no statistically significant difference between the 2 groups (97% vs. 95%, P = 0.7).

Table 1. Demographic Data of the Patients in Both IBS and Non-IBS Groups

	Gender			Age, y			Weight, kg		
	Total	Male	Female	Minimum	Maximum	Mean	Minimum	Maximum	Mean
IBS	72	35	37	24	69	43.4	50	87	68.9
Non-IBS	100	24	76	22	72	46.6	40	112	67.8

Table 2. The Most Common Indications for Colonoscopy in IBS and Non-IBS Groups (Frequencies Are Presented with Decreasing Order)

Indication	Results[a]
IBS	
Progressive abdominal pain	29 (40.3)
Fresh rectal bleeding	10 (19.3)
Occult blood in Stool	8 (11.1)
Poor response to medical treatment	6 (8.3)
Iron deficiency anemia	4 (5.6)
Family history of Colon cancer	3 (4.2)
Progressive constipation	3 (4.2)
Diarrhea	3 (4.2)
Nocturnal pain	1 (1.4)
Weight loss	1 (1.4)
Other reasons	4 (5.6)
Total	100 (100)
Non-IBS	
Fresh rectal bleeding	47 (47)
Iron deficiency anemia	9 (9)
Colorectal Cancer Screening	8 (8)
Weight loss	7 (7)
Occult blood in Stool	6 (6)
Constipation	6 (6)
Family history of Colon cancer	4 (4)
Progressive abdominal pain	2 (2)
Diarrhea	2 (2)
Nocturnal pain	1 (1)
Colon polyp surveillance	1 (1)
Other reasons	7 (7)
Total	72 (100)

[a] Values are expressed as No. (%).

Subgroup analysis according to gender revealed that pain sensation, quality of bowel preparation, technical difficulty of the colonoscopy, duration of the procedure, and the success rate of the colonoscopy had no statistically significant difference in the male patients of IBS and non-IBS groups.

In female patients, pain sensation was significantly more in the IBS group compared to non-IBS group (VAS = 5.5 vs.4.5, P = 0.02). Quality of the bowel preparation, success rate, and technical difficulty of the colonoscopy showed no significant difference (P = 0.43 and 0.9).

The results are summarized in Table 3.

4. Discussion

In this study, our patients' population in IBS group were younger, with higher mean body weight, but not statistically significant. The two groups were also similar in mean age.

According to the result of the study, IBS patients felt more pain during colonoscopy. This finding supports the "Hyperalgesia" theory in the IBS patients (7). This theory describes how IBS patients have more pain related to colon distention compared to normal population. Our results are similar to those of previous studies. In the study by Nattermann et al. (9), IBS patients had more pain, although not significant during the colonoscopy. However, another study with smaller number of patients (n = 20) showed a significant difference in the pain perception in the IBS patients (10).

The higher rate of requiring sedative medication during the procedure in the non-IBS patients was mainly related to the females in non-IBS groups. This could be explained by longer duration of procedure in this subgroup of patients. This result revealed that although the IBS patients' procedure- related pain self-rated score was higher, they could tolerate the procedure well without increased demand for sedation.

Our study indicated that the quality of bowel preparation had no significant difference in IBS patients compared to non-IBS patients. In other words, IBS patients followed the colon preparation orders and tolerated the prescribed medication as well as non-IBS patients.

Unlike our previous belief, the current study revealed that colonoscopy in IBS patients is not associated with more technical difficulty and the diagnosis of IBS by itself does not make colonoscopy more difficult.

Based on the result of this study in the IBS patients, while the success rate of colonoscopy is similar to non-

Table 3. The Results of Measurement of Parameters Related to Colonoscopy in IBS and Non-IBS Patients and Comparison Between These Two Groups in General and Also in Gender Specific Subgroups[a]

	All Patients (172)			Male (59)			Female (113)		
	IBS (72)	Non-IBS (100)	P Value	IBS (35)	Non-IBS (24)	P Value	IBS (37)	Non-IBS (76)	P Value
Pain intensity (VAS score)	5.08 ± 1.98	4.44 ± 1.88	0.006	4.68 ± 1.89	4.12 ± 1.72	0.25	5.45 ± 2	4.5 ± 1.9	0.02
Technical difficulty of colonoscopy (VAS score)	4.72 ± 1.5	4.84 ± 1.45	0.61	4.54 ± 1.63	4.79 ± 1.35	0.54	4.89 ± 1.44	4.85 ± 1.49	0.9
Quality of bowel preparation (Boston BPS)	7.55 ± 1.67	7.24 ± 1.76	0.239	7.65 ± 1.62	7.37 ± 2.1	0.56	7.45 ± 1.74	7.19 ± 1.65	0.43
Duration of the procedure (minute)	13.1 ± 2.62	14.1 ± 2.22	0.006	12.7 ± 2.7	13.6 ± 1.49	0.14	13.5 ± 2.4	14.3 ± 2.39	0.09
Success rate of colonoscopy, %	97	95	0.7	94	100	0.5	100	93	0.17

Abbreviations: BPS, bowel preparation scoring system; IBS, irritable bowel syndrome; VAS, visual analogue scale.
[a] Values are expressed as mean ± standard deviation.

IBS patients, its duration is shorter. These interesting results could be explained by some reasons. In the IBS patients, it is usually assumed that no specific lesion would be found in the colonoscopy and the procedure is mainly diagnostic, so no extra time is spent to observe the specific lesions, biopsy sampling, passing through the stricture, snare polypectomy, and other therapeutic interventions; moreover, there is no obstacle such as tumours or strictures, which precluded accessing the proximal parts of the colon. Therefore, duration could be shorter in the IBS patients.

4.1. Conclusions

To the best of our knowledge, our study was the first to compare major influencing parameters in the colonoscopy between IBS and non-IBS patients. Our results showed that IBS patients had more pain sensation during the colonoscopy, but they had the same quality of colon preparation compared to non-IBS patients and the colonoscopy was not more difficult for them. Finally, according to our results, with a similar success rate, the duration of colonoscopy was shorter in the IBS patients.

References

1. Maxion-Bergemann S, Thielecke F, Abel F, Bergemann R. Costs of irritable bowel syndrome in the UK and US. *Pharmacoeconomics*. 2006;**24**(1):21–37. [PubMed: 16445300].
2. Canavan C, West J, Card T. The epidemiology of irritable bowel syndrome. *Clin Epidemiol*. 2014;**6**:71–80. doi: 10.2147/CLEP.S40245. [PubMed: 24523597].
3. Manning AP, Thompson WG, Heaton KW, Morris AF. Towards positive diagnosis of the irritable bowel. *Br Med J*. 1978;**2**(6138):653–4. [PubMed: 698649].
4. Mearin F, Lacy BE, Chang L, Chey WD, Lembo AJ, Simren M, et al. Bowel Disorders. *Gastroenterology*. 2016. doi: 10.1053/j.gastro.2016.02.031. [PubMed: 27144627].
5. Jayadevan R. Prevalence of Colorectal Polyps: A Retrospective Study to Determine the Cut-Off Age for Screening. *J Gastroenterol Pancreatol Liver Disord*. 2016;**3**(2):1–5. doi: 10.15226/2374-815x/3/2/00156.
6. Waldmann E, Heinze G, Ferlitsch A, Gess II, Sallinger D, Jeschek P, et al. Risk factors cannot explain the higher prevalence rates of precancerous colorectal lesions in men. *Br J Cancer*. 2016;**115**(11):1421–9. doi: 10.1038/bjc.2016.324. [PubMed: 27764840].
7. Nozu T, Kudaira M, Kitamori S, Uehara A. Repetitive rectal painful distention induces rectal hypersensitivity in patients with irritable bowel syndrome. *J Gastroenterol*. 2006;**41**(3):217–22. doi: 10.1007/s00535-005-1748-z. [PubMed: 16699855].
8. Oh SY, Sohn CI, Sung IK, Park DI, Kang MS, Yoo TW, et al. Factors affecting the technical difficulty of colonoscopy. *Hepatogastroenterology*. 2007;**54**(77):1403–6. [PubMed: 17708264].
9. Nattermann C, Fimmers R, Bayer B. [Irritable bowel syndrome: colonoscopy painful and difficult?]. *Med Klin (Munich)*. 2004;**99**(12):713–8. doi: 10.1007/s00063-004-1105-7. [PubMed: 15599681].
10. Chacaltana Mendoza A, Diaz Rios R, Alva Alva E, Vasquez Valverde N, Celestino Morales C. [Perception of pain during sigmoidoscopy flexible as an additional diagnostic method for irritable bowel syndrome]. *Rev Gastroenterol Peru*. 2012;**32**(2):178–83. [PubMed: 23023181].
11. Van Weyenberg SJB. Grading the Quality of Bowel preparation. *Video J Encyclopedia GI Endoscop*. 2014;**1**(3):615–8.
12. Gerard DP, Foster DB, Raiser MW, Holden JL, Karrison TG. Validation of a new bowel preparation scale for measuring colon cleansing for colonoscopy: the chicago bowel preparation scale. *Clin Transl Gastroenterol*. 2013;**4**. e43. doi: 10.1038/ctg.2013.16. [PubMed: 24304940].