

Gender Wise Clinical Comparison of Primary Constipation and Irritable Bowel Syndrome: Among Patients From Eastern India

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Abstract: Constipation is a major health issue that can develop directly due to known organic causes or indirectly due to other systemic are known as primary constipation. Clinically this can be of two types functional constipation and constipation associated with irritable bowel syndrome (IBS-C). Patients from both of these types may be from different age group, different gender and also be presented with common pathophysiologic subtypes like dyssynergic defecation (DD), normal / slow colon transit constipation (NTC). The objective of this study is to analyze and compare different clinical parameters of constipation and IBS-C according to the basis of gender distribution. The success of biofeedback therapy (BFT) was also assessed among patients with DD. Patients registered under Burdwan Medical College since April 2014-February 2019, were considered in this study. Among them 127 patients with either constipation or IBS-C were included in this study according to Rome III criteria. All patients underwent anorectal manometry with balloon expulsion test and colon transit study. Patients with the problem of DD were given BFT. Few clinical criteria like maximum squeeze pressure and rectal sensation showed significant difference between constipation and IBS-C. These criteria also varied significantly between male and female patients of both groups. It was found in this study that occurrence of DD is more prevalent in constipation rather than IBS-C. In case of constipation slow colon transit was evident on the contrary of normal colon transit in case of IBS-C. However, the biofeedback therapy for four or more sessions was found to be beneficial for both groups irrespective of any gender.

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I. Introduction

Constipation is a common problem among varied range of ages including children and aged people. Constipation may be due to primary gastrointestinal disorders of apparently unknown causes (idiopathic). It may be secondary to various systemic disorders, neurological diseases and chronic medications.¹ Another very common gastrointestinal disorder worldwide is irritable bowel syndrome (IBS).² It was revealed from several studies that IBS is more common in women than men.³ However, the term constipation is not well defined and so the exact prevalence in larger part of Indian population is yet to be defined.⁴ The clinical condition depends on subjective feeling of inability or difficulty to pass feces smoothly or regularly. It may be due to hard stool or obstruction to its passage. The perception of the patient and doctor may vary regarding the term constipation. According to physicians constipation can be defined as i) Stool frequency of less than three bowel movements per week, ii) Whole gut transit time of more than 68 hours.⁵ However, normal stool frequency and form depends on geographic and ethnic factors and so varies between different populations.⁶ In several Asian countries the normal stool frequency is 1-2 motions/day in majority of population and thus here stool frequency of less than 5 motions/week can be considered as symptom of constipation where the subjective feeling of incomplete evacuation should also be given due weightage.⁴ The problem of constipation is more prevalent in western countries (27%) rather than eastern countries ranges from (9%).² It was found that the problem of constipation increases with age.⁷ As it is not a life threatening or debilitating disease so there is a popular practice of use of laxatives and ayurvedic preparations.⁶ It was found that very low frequency of patients seeks medical advice and majority of patients are habitual consumers of laxatives, which in the long run may cause adverse effect.

A committee was created in 1980 to establish permanent criteria to diagnose the disease, these criteria are known as Rome criteria and then it was modified to form Rome II criteria (2006). The Rome III criteria are the latest updated criteria.⁵ These criteria are used to maintain uniformity in diagnosis, clinical trial and epidemiological studies of the disease.

There are no such study with eastern Indian population about prevalence and clinical profile of this disease. In the present study the prevalence, clinical profile of FC and its difference with IBS among eastern Indian patients are evaluated. It was also evaluated that if biofeedback therapy is effective among both group or not.

II. Materials and methods

A prospective evaluation of both indoor and outdoor patients with constipation and IBS-C to the Dept. General Surgery, Burdwan Medical College, Burdwan, West Bengal from April 2014-February 2019. (Total 550 patients were collected, who attended surgery OPD of Burdwan Medical College and Hospital with some symptoms of constipation). Among them 227 (41.3%) patients were included for this study considering the Rome III criteria. There are several factors for diagnosis of constipation or IBS-C. These include Dietary details, stool/ week, stool consistency, colon transit study, dysfunction of pelvic floor and anal sphincter muscles (anismus), anorectal manometry.^{6, 8} In the hospital patients were diagnosed first and they were then included for the study using following inclusion criteria.

Inclusion criteria

Here only adult patients with chronic constipation defined by Rome III criteria and constipation predominant irritable bowel syndrome (C-IBS) at this hospital were included in the study.

Exclusion criteria

Patients not reported with primary constipation i.e they are reported with other systemic disorders, medications and neurological dysfunction are not considered here in this study.

Study protocol

According to inclusion criteria defined by Rome III criteria patients with chronic constipation or C-IBS were enrolled in the study along with their written informed consent. Their clinical history and Bristol stool form scale were noted. All patients underwent complete blood count, fasting and postprandial blood sugar, serum calcium, thyroid function test, serum creatinine, stool examination, colonoscopy (some cases only sigmoidoscopy was considered adequate), anorectal manometry, and colon transit study.

Anorectal manometry

Anorectal pressure changes (muscle contractions and relaxation) in the rectum and anal sphincter were measured using high-resolution manometry. During each study following parameters i.e anorectal pressures at rest (60 s), during squeeze (three attempts for a maximum duration of 20 s each), the rectoanal inhibitory reflex were measured at 25 Hz using special software (Trace Version 1.2v, Hebbard, Melbourne, Australia). After that rectal sensation was evaluated simultaneously by progressively distending the rectal balloon in 10-mL increments from 0 to 400 mL; threshold volumes for first sensation, urgency, and maximum discomfort were recorded. Reduced rectal sensitivity or rectal hyposensitivity (RH) was defined as insensitivity of the rectum to balloon distention. Rectal hyposensitivity was considered if one of the three sensations recorded were higher than the normal range (upper value of normal was considered).^{9, 10}. (Table 1).

Balloon expulsion test

This test was recorded after distending a rectal balloon with 50 mL of air and each patient was asked to expel the balloon. Normally it should be expelled within 1 min, if any deviation from that time would be considered as abnormal or inadequate propulsive forces (a rise in intrarectal pressure >40 mmHg) were considered to have dyssynergic defecation (DD). Dyssynergic defecation was further divided into four types (I-IV) depending on ability to produce propulsive force along with inability to relax anal sphincter.^{11, 6}

Colon transit study

This is most useful and primary test to evaluate disorder in colonic motility. It was done with the help of radio-opaque markers.¹² Patients were asked to intake four gelatine capsules at a time (each contains five radio-opaque markers) at 0, 12, and 24 h. Subsequently, an abdominal X-ray was obtained in the erect posture at 36 and 60 h. It was taken into consideration that the patients were on normal diet and normal activities during the study period. No patient took any drug that could alter. Laxatives, enemas and other medications which could alter gastrointestinal motility within 7 days before and during the study period were avoided for each patient. The transit was said to be slow if more than 30 and/or 14 radio-opaque markers were seen after 36 and

60 h, respectively. There can be two types (i) Normal-transit constipation (NTC) and (ii) slow-transit constipation (STC). According to clinicians NTC (20hr. – 70hr.) are much common i.e patients reported with presence of hard stools or difficulty with evacuation but upon testing it was found that stool transit and frequency are both in normal range. Those patients experience abdominal discomfort or pain due to excess gas production is considered as patients of irritable bowel syndrome with constipation (IBS-C).¹. Patients with STC usually reported with infrequent bowel movement (less than once per week). It is a neuromuscular disorder of the colon.

Biofeedback therapy

Patients with DD were advised to undertake the sessions of biofeedback therapy (BFT). This is a neuromuscular training to restore a normal pattern of defecation. During the feedback session, the subject was asked to take a good diaphragmatic breath and to push down as if to defecate. The subject was encouraged to watch the monitor while performing this maneuver. The subject’s posture and breathing techniques were continuously monitored and corrected. The visual display of the pressure changes in the rectum and anal canal on the monitor provided instant feedback. Biofeedback was done in the left lateral position at a frequency of 2 weeks. The subject was instructed to do similar exercise 3–4 times a day in the intervening days. A minimum of four sessions of biofeedback were considered to be adequate before assessing response. Response was assessed as improvement in passing complete spontaneous bowel movements.

Statistical analysis

Results were expressed as percentages (%). Continuous variables and discrete variables were compared with Student’s t-test and chi-square test respectively. P value <0.05 was considered as significant. The study was approved by the hospital ethics committee. All the patients participated in this study had informed consent taken.

III. Results

Studied population

Total 227 patients with constipation are included in this study considering the inclusion criteria. They are registered all under Dept. of Surgery, Burdwan Medical College, Burdwan, West Bengal, India within April 2014-February 2019. General characteristics of studied samples are summarized in Table 1. Among 227 patients 163 (~72%) patients had primary constipation and 64 (28%) had IBS-C. The age range presented primary constipation and IBS-C were 32-86 yrs and 24-46 yrs respectively (Table 1). In case of gender distribution most of the patients were male (65%), among them majority had problem of primary constipation. In case of female majority had a problem of IBS-C (Table 1). Most of the patients are service holders both in case of primary constipation (~60%) and IBS-C (80%). However, a significant percentage (70%) of patient population had tobacco habit. So, it may have some adverse effect on the disease. Most of the patients in both groups [constipation (62%) and IBS-C (77%)] came within 1st year of onset of disease.

Studied population	Total	Primary constipation (%)	IBS-C (%)
Number of patients	227	163 (71.8%)	64 (28%)
Age	24-86 yrs	27-86 yrs	24-46 yrs
Sex	Male 148 (65%)	133 (81.5%)	16 (25%)
	Female 79 (34.8%)	30 (18.4%)	48 (75%)
Occupation	Service	97 (59.5%)	51 (79.6%)
Religion	Hinduism	115 (70.5%)	45 (70%)
	Muslim	44 (27%)	18 (28%)
Tobacco Habits	159 (70%)	102 (45%)	57 (89%)
Duration of illness	6 months- 1 year	101 (62%)	49 (76.5%)
	1 yr - 2 yrs	45 (27.6%)	15 (23%)
	> 5 yrs	17 (10%)	-

Table 1: General characteristics of patients
Gender wise comparison of functional constipation and IBS-related constipation

The factors associated with these diseases are compared (Table 2) to find any significant differences between two diseases according to gender distribution. Here in this study it was found that most of the patients in IBS-C were female (75%). The age distribution showed a significant difference between both diseases. Constipation problem is mostly associated with older age mostly in case of male. However, younger to middle age group irrespective of gender is mostly affected by IBS-C (Table 2). Though the sample number is low still it was found in this study that male patients are mostly affected by the constipation at late age, whereas it was

found that young female groups are affected by both constipation and IBS-C (Table 2). Stool frequency per week showed significant difference between constipation and IBS-C irrespective of gender variation (Table 2). The manometric parameters like squeeze pressure, rectal sensation varied significantly between the two groups as well as with respect to gender distribution. The male patients with constipation showed the maximum squeeze pressure 220.4 ± 0.5 mmHg with respect to 165.7 ± 0.8 mmHg pressure which was much lower in patients with IBS-C (Table 2). Female patients showed lower squeeze pressure value than male patients in each group (Fig 1). Rectal sensation also revealed significant differences between the two groups (Fig 1). Here in this study it was found that rectal sensation was significantly higher in case of constipation than IBS-C. First sensation showed significant difference in case of both constipation [(male 95.2 ml) and (female 89.2 ml)] and IBS-C [(male 55.4 ml) and (female 52.6 ml)] group than normal [(male 15-30 ml) and (female 18-26 ml)]. Urgency and maximum discomfort showed insignificant differences from normal as well as between two groups. These parameters also varied eventually with respect to gender. The occurrence of DD was mostly evident in case of constipation irrespective of gender distribution (Male 68% and female 57%). Colon transit study revealed patients with constipation showed slow colon transit irrespective of gender distribution unlike IBS-C where most of the patients showed normal transit. The sense of incomplete evacuation was significantly higher in IBS-C (73%). However, a certain percentage of patients in constipation group also have the problem of incomplete evacuation.

Factors	Normal subjects (N=75)		Primary constipation (N = 163)		IBS-C (N = 64)		
	Male (N=39)	Female (N=36)	Male (N=133)	Female (N=30)	Male (N=16)	Female (N=48)	
Mean Age	20-75	25-56	48-86	27-35	34-46	24-40	
Stools/week	Daily	Daily	$\leq 3 - \leq 5$	$\leq 3 - \leq 4$	3times a day-3 times/ week	3times a day-3 times/ week	
Bristol stool scale	4-5	4-5	3 ± 1	2 ± 0.6	4 ± 0.2	5 ± 1	
Maximum squeeze pressure (mmHg)	120-145	105-134	172.4 ± 0.5	158.6 ± 0.8	155.7 ± 0.8	148.6 ± 0.7	
Rectal sensation	First sensation (ml)	15-30	18-26	95.2 ± 0.8	89.2 ± 0.8	55.4 ± 0.8	52.6 ± 0.6
	Urgency (ml)	90-139	94-133	159.3 ± 0.1	145.6 ± 0.6	89.5 ± 0.7	74.2 ± 0.5
	Maximum discomfort (ml)	172-228	168-189	235.6 ± 1.1	199.2 ± 0.6	185.9 ± 0.6	168.4 ± 1.4
Dyssynergic defecation	-	-	92 (69%)	17 (56.6%)	8(50%)	5 (10.4%)	
Transit study	Slow transit	-	-	103 (77%)	21 (70%)	-	8 (16.7%)
	Normal transit	-	-	29 (21.8%)	12 (40%)	10 (62.5%)	33 (68.7%)
Incomplete evacuation	-	-	84 (63%)	17 (56.6%)	7 (43.7%)	36 (75%)	

Table 2: Gender wise comparison of different clinical parameters of constipation and IBS-C patients with clinically normal individuals. Normal individuals (N= 75) both male and female are voluntarily participated in the study. * indicate p value <0.05. Parameters of the patients were compared with respect to normal individuals and within two groups.

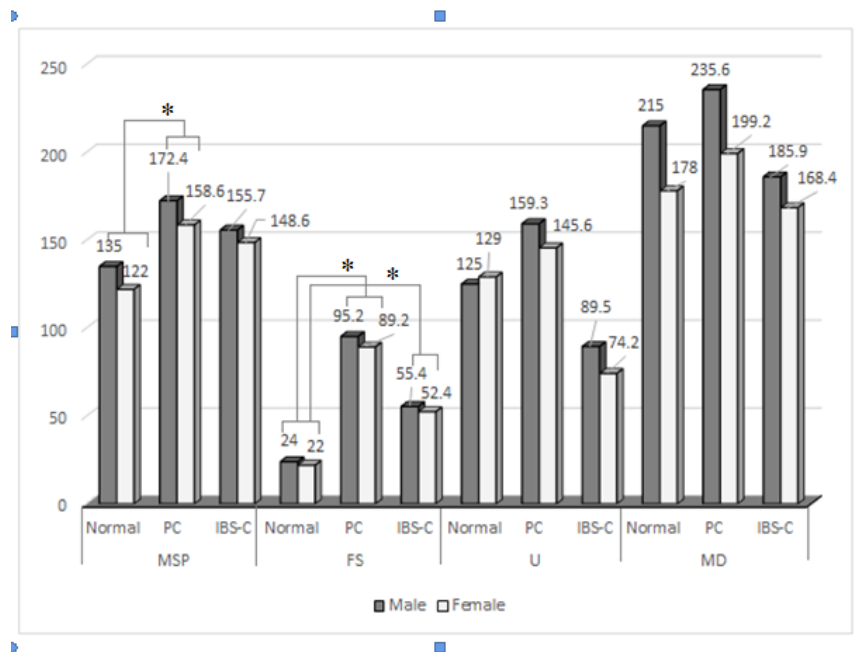


Figure 1: Histogram showing comparison among different clinical parameters maximum squeeze pressure (MSP) and rectal sensation [First sensation (FS), Urgency (U) and constipation associated irritable bowel syndrome (IBS-C)] of constipation and IBS-C patients with clinically normal individuals. Normal individuals (N= 75) both male and female are voluntarily participated in the study. * indicate p value <0.05. Parameters of the patients were compared with respect to normal individuals and within two groups.

Response to biofeedback therapy

Among 227 total patients 122 patients were presented with the problem of DD in both groups (Fig 2). Among them 95 patients agreed for BFT irrespective of clinical representation or gender distribution. Among these 95 patients 58 patients received only 1-2 session, 15 patients received more than 2 sessions, and 22 (45 %) patients completed more than 4 sessions. Fifteen (75 %) out of 22 patients who completed more than 4 sessions had a significant response to symptoms after therapy in form of passing complete spontaneous bowel movements. However, the manometric parameters after completion of BFT were not recorded in this study.

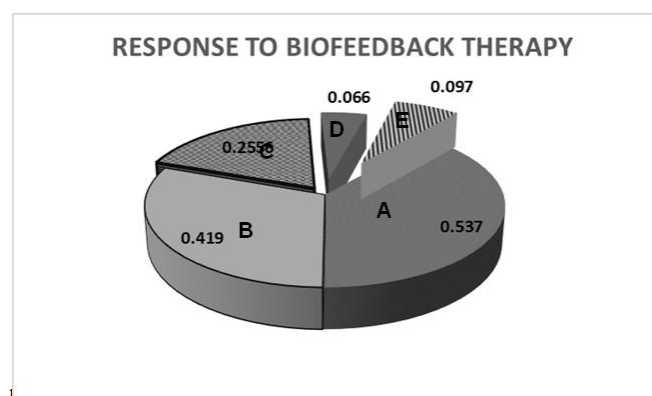


Figure 2: Graphical representation of percentages of patient agreed/ responded to biofeedback therapy. (A) represents total percentage of patients (53.7%) with the problem of DD among all the patient population. (B) represents percentage (41.9%) of patients agreed to take this therapy among total patients. (C) (D) and (E) represents percentage of patients received the therapy for 1-2 sessions, 2 sessions and more than 4 sessions.

IV. Discussion

Chronic problem associated with difficulty or infrequent passage of stool, hardness of stool, or a feeling of incomplete evacuation ultimately leads to chronic constipation or constipation associated irritable bowel syndrome (IBS). The Rome III criteria guide the physicians to differentiate and understand the clinical manifestation of the problems and classify subjects according to their symptoms. Age and gender are two important factors which are associated with these syndromes.

In this study most of the patients are male that may raise contrast with other studies which showed female prevalence over male among these diseases. As India is a male-dominating society, so the concern of protecting male member is probably the best explanation for this difference. However, constipation is very common in case of subjects with older age i.e above 65 age group. In our study also we got majority older male patient (79%) in constipation group. The prevalence of female patients in older age group is more than male patients.¹³ Here we have seen all the female patients both in case of constipation and IBS are of younger age group (24-40). In case of IBS several lifestyle factors and sex hormone related factors play important roles in this disease to make it more prevalent among females than males.³ Female sex hormones Estrogen and progesterone are known to inhibit smooth muscle contraction. Moreover, progesterone modulates the system to control peristalsis. In this study we also got mostly female patients in IBS group.

The manometric parameters differed significantly among two genders and diseases. The maximum squeeze pressure and rectal sensation varied gender wise unlike other studies. This variation may result from varied sample size. Uniform and larger sample size may reflect more precise data. In our study it was found that occurrence of DD is more common (68% male and 57% female) in constipation group than IBS (10%). Among these patients most of them presented with slow colon transit movement. Most of the patients without DD also showed slow colon transit (78% male and 62% female). Unlike this data in IBS group 76% patients showed normal transit. So, there is a significant difference between two groups in case of colonic transit study irrespective of gender differences. However, Shah et. al. reported that they got no significant difference between constipation and IBS group in case of manometric parameter as well as in colon transit study.⁶ The possibility of this difference might be varying sample number between two groups.

Treatment pattern for both groups would be same. Biofeedback therapy was provided for the patients with the problem of DD. Most of these patients are in constipation group. The aim of BFT is to correct the dyssynergia or in coordination of the abdominal, rectal, puborectalis and anal sphincter muscles in order to achieve a normal and complete evacuation. This was achieved with multiple sessions (>4) of therapy for patients with DD, with each session lasting for at least 30 min. 75% of the patients who received adequate BFT had a significant response in bowel movements irrespective of any group and gender. However, after therapy defecography with manometry would be much helpful to confirm the diagnosis of defecation disorder but in our study, it was not feasible in our study.

V. Conclusion

Our result showed significant difference in case of few important parameter like maximum squeeze pressure and first rectal sensation between two groups of patients (constipation and IBS-C group) and within two genders. However, the result can vary with different or more sample size. This study also suggests that unnecessary usage of laxative¹⁴ can be avoided with proper identification of DD in patients and application of BFT as both type of patients can be benefitted from the use of biofeedback therapy.

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Conflict of interest

There is no conflict of interest among authors.

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