DOI: 10.7860/JCDR/2016/15487.7524

Original Article

Internal Medicine Section

Evaluation of the Symptom of Constipation in Indian Patients

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ABSTRACT

Introduction: The exact prevalence of constipation in India is unknown. To know this, first it has to be properly defined based on stool frequency and form (as in western definition) in Indian patients, data on which is scarce. There may be difference with the western definition also.

Aim: To determine the stool frequency and form in patients consulting doctor for the complaint of constipation and compare these with the Western definition of constipation.

Materials and Methods: This was a prospective cross-sectional study on 331 consecutive patients seeking medical advice for their complaint of constipation. They were administered a questionnaire containing Rome III criteria points of functional constipation and constipation predominant irritable bowel syndrome and the Bristol stool chart to report their predominant stool form. Organic bowel diseases were excluded by further history taking, physical examination and appropriate investigations. The data on stool frequency and form thus obtained were compared with the existing Indian population data.

Results: A total of 65% patients were above 60 years of age. The predominant stool types were 1-3 according to Bristol stool form scale present in 93.8% patients and conformed to Asian criteria of constipation by stool form. Only 67.9% patients passed Bristol Stool Scale (BSS) type 1 and 2 stool which is the western definition. 51.5% reported a frequency of 3-4 motions/week, 19.8% had normal stool frequency by Indian standard (i.e. at least 1 motion/day) and only 35.4% had constipation by Western criteria (less than 3 motions/week). Hence subjective feeling varied widely from observed rate and Western definition was invalid in about twothird of patients. Feeling of incomplete evacuation was universal and this was referred to as constipation by patients. Functional constipation was diagnosed in 69.1% (of whom most were elderly with co-morbidities) and constipation predominant irritable bowel syndrome in 13.8% by Indian standard. Only 2.1% had colonic cancer.

Conclusion: A stool frequency of <5 motions/week appears more appropriate in Indian definition of constipation where the subjective feeling of incomplete evacuation should also be given due weightage. Asian criteria based on stool form holds true in India.

Keywords: Bristol Stool Scale, Functional bowel disease, Irritable bowel syndrome, Rome III criteria.

INTRODUCTION

Constipation is a common complaint in any population. About 20% of people in USA suffer from constipation [1]. One population based study from India in only 505 people found the prevalence of constipation by the Rome II criteria to be 16.8% and self-reported constipation to be 24.8% in the last 1 year [2]. Another study gives some estimate about constipation predominant Irritable Bowel Syndrome (IBS-C) [3] but the true prevalence of constipation in the larger Indian population is not known due to lack of a uniform definition of constipation. The term constipation is basically a patient's perception variously describing subjective feeling of inability to pass feces smoothly or regularly, hard stool or obstruction to its passage, unproductive urges or feeling of incomplete evacuation and hence it is difficult to define. Normal stool frequency and form is also determined by geographic and ethnic factors and so varies between population [4]. Data on normal bowel frequency in a population is necessary to define constipation which logically should be a frequency of stool passage less than the normal minimum for that particular population. This was the basis for the various Rome criteria defining constipation as less than 3 motions per week as this is the normal minimum in Western population [5-7]. Stool form {described by Bristol Stool Form Scale (BSS)} [8] is also reported to be a good marker of slow colonic transit and constipation. In Rome III criteria, it has been given more weightage than frequency. In the West stool type 1 and 2 on BSS is regarded as indicating constipation [8,9].

The situation in Asia is different. In several Asian countries the normal stool frequency is 1-2 motions/day in over 90% of population [10-13] and Asian criteria puts normal stool form as Type 4 with constipation corresponding to Type 1-3 on BSS [14]. Indian data on stool form is scarce [15]. Also, the perception of the patient and doctor may vary regarding the term constipation.

The present study was undertaken in a cohort of patients (CONSULTERS) with the complaint of constipation (as per their own perception) in an attempt to evaluate the person's perception of constipation in light of his stool frequency, form and/or other symptoms and to compare this data with Rome III criteria of Functional Constipation (FC) and IBS-C [10]. This will highlight the similarities and differences with ROME III criteria and help in formulating a proper definition of constipation.

MATERIALS AND METHODS

A total of 331 consecutive patients with the complaint of constipation (as per their own perception) were included in the prospective cross-sectional study from April 2012 to April 2015. This study hospital is a tertiary care hospital with a vast and predominantly general referral base and also has an open access system for patient consultation. Thus apart from tertiary care, it serves primary and secondary care also.

Patients were mostly recruited from OPD attendance, except some indoor patients admitted for other reasons who complained of constipation. Evaluation included: (i) a structured history based on questions pertaining to diagnosis of FC and IBS - C using the Rome III criteria [Table/Fig-1,2]; (ii) Evaluation for organic disease including history of alarm features, co-morbid conditions (Parkinson's disease, vascular dementias, ischemic brain and heart diseases)

and drug intake (like calcium, iron, calcium channel blockers, beta blockers, antidepressants and antipsychotics which are known to cause constipation), thorough physical examination and investigations including complete haemogram, blood biochemistry, fasting and postprandial blood sugar, thyroid function test, stool microscopy and occult blood test and colonoscopy.

To compare with Western criteria and also to determine the objective incidence in those having the subjective complaint, constipation was defined as any frequency less than 1/day (7/week) since normal bowel frequency in 90% of Indian population is 1-2/day [11].

STATISTICAL ANALYSIS

Results were expressed as proportions (%). Continuous variables and discrete variables were compared with Student's t-test and chi-square test respectively and two sided p <0.05 was considered significant. The study was approved by the hospital ethics committee and all patients consented to be included in the study.

RESULTS

The study results are shown in [Table/Fig-1-3]. All patients consumed mixed diet, none were pure vegetarians. 7/331 (2.1%) patients were diagnosed with cancer colon and all had alarm features like bleed per rectum, anaemia, weight loss. These were excluded from further analysis. Of the remaining 324 persons, 211 (65%) were above age of 60 years. 64 (19.8%) had normal bowel frequency i.e. at least 1 motion/day. Of them, 16 (25%) complained of straining and 60 (94%) of incomplete evacuation. FC [Table/Fig-1] was diagnosed in 224 (69.1%) patients overall by Western criteria while by Indian standard, it was in 224/260 (86.2%). The corresponding figures for IBS-C [Table/Fig-2] were 36 (11.1%) and 36/260 (13.8%).

1. Must include *two or more* of the following for the last 3 months with symptom onset at least 6 months prior to diagnosis	
a. Straining during at least 25% of defecations	155 (69%)
b. Lumpy or hard stools in at least 25% of defecations	BSS Type 1-2= 190(85%) BSS Type 1-3 = 100%
c. Sensation of incomplete evacuation for at least 25% of defecations	100%
d. Sensation of anorectal obstruction/blockage for at least 25% of defecations	18 (8%)
e. Manual maneuvers to facilitate at least 25% of defecations (e.g., digital evacuation, support of the pelvic floor)	18 (8%) used digital evacuation, 40 (18%) used enema
f. Fewer than three defecations per week	80 (35.7%)
2. Loose stools are rarely present without the use of laxatives	100%
3. Insufficient criteria for irritable bowel syndrome	100%

[Table/Fig-1]: Frequency of symptoms in patients with FC (n=224).

Recurrent abdominal pain or discomfort at least 3 days/month in last 3 months (with symptom onset at least 6 months prior to diagnosis) associated with two or more of the following	100%
1. Improvement with defecation	24 (66.7%)
2. Onset associated with a change in frequency of stool	22 (61.1%)
3. Onset associated with a change in form (appearance) of stool	22 (61.1%)
IBS-C (BSS type 1 or 2 > 25% defecations and type 6 or 7 < 25% defecations)	16 (44.4%)
IBS-D (BSS type 1 or 2 < 25% defecations and type 6 or 7 > 25% defecations)	None
IBS-M (BSS type 1 or 2 > 25% defecations and type 6 or 7 > 25% defecations)	None
IBS-U (BSS type 1 or 2 < 25% defecations and type 6 or 7 < 25% defecations)	20 (55.6%).

[Table/Fig-2]: Frequency of symptoms in patients with IBS-C (n=36).
IBS-C (Constipation), IBS-D (Diarrhoea), IBS-M (Mixed), IBS-U (Unclassified). Straining present in 22 (61%) and feeling of incomplete evacuation in 100% patients.

Number of patients (n) with	Normal (N) bowel frequency (n=64)	Functional constipation (FC) (n=224)	Irritable bowel syndrome with predominant constipation (IBS-C) (n=36)	Overall (n=324)
Age in years Mean ± SD (Range)	37.4 ± 5.6 (22-57)	63.4 ± 9.5 (49-78) @	33.7 ± 5.6 (23-50)	55.2 ± 7.4 (22-78)
Sex (M:F)	35:29	120:104	22:14	177:147
Stool frequency				(n = 260)
Median (range)	10 (7-12)	3 (0-5)	3 (2-5)	5 (0-12)
< 3/week (%) M:F	0	80 (35.7) 40:40	12 (33.3) 8:4	92 (35.4) 48:44
3/week (%) M:F	0	54 (24.1) 24:30	8 (22.3) 2:6	62 (23.8) 26:36
4/week (%) M:F	0	60 (26.8) 40:20*	12 (33.3) 10:2	72 (27.7) 50:22*
5/week (%) M:F	0	30 (13.4) 16:14	4 (11.1) 2:2	34 (13.1) 18:16
BSS Stool type (%) M:F				
TI	4 (6.3) 2:2	108(48.2)**56:52	6 (16.7) 2:4	118 (36.4) 60:58
T2	10 (15.6) 5:5	82(36.6)^ 42:40	10 (27.8) 4:6	102 (31.5) 51:51
T3	38(59.4) 20:18	34(15.2)^^22:12	12 (33.3) 8:4	84 (25.9) 50:34
T4	12(18.7) 8:4 #		8 (22.2) 8:0	20 (6.2) 16:4 #
Co-morbidities (%)				
(a) DM	10 (15.6)	45 (13.9),	2 (5.6)	57 (17.6),
(b) Hypothyroid	2 (3.1)	30 (13.4),	2 (5.6)	34 (10.5),
(c) Organic brain disease		64 (28.6),		64 (19.8),
(d) Combination of above		44 (19.6)		44(13.6)
(e) Drugs		122 (54.5)		122 (37.7)
Colonoscopy (%)				
Normal	64 (100)	166 (51.2)	36 (100)	266 (82.1)
Dilated, atonic colon		43 (19.2)		43 (13.3)
Diverticula		15 (6.7)		15 (4.6).

[Table/Fig-3]: Demographic parameters.
DM = Diabetes mellitus, Following are significantly different ($p < 0.05$) @Age of FC more than IBS-C N, *and # M>F, ** FC more than N and IBS-C, ^ FC more than N, ^^ N more than FC. All others differences non significant across groups and between sexes.

BSS Type 1-3 stool was passed by 93.8% patients overall, 81.3% patients with normal stool frequency (by Indian standards), 100% in the FC group and 77.8% in the IBS-C group. Only 67.9% patients passed BSS type 1 and 2 stool. Most patients reported stool frequency of 3-4/week both in FC (50.9%) and IBS-C group (55.6%).

There was male preponderance in both IBS-C and FC group. BSS Type 1 and 2 was significantly more in patients of FC whereas Type 3 was more in those with normal bowel frequency. Except that more males had Type 4 stool and less than 4/week frequency than females, there was no gender difference for other stool types or frequencies in this cohort.

Co-morbidities were present in 10 (15.6%), 190 (84.8%), 3 (8.3%) of those with normal bowels, FC and IBS-C respectively. It was significantly more in FC group compared to the other two ($p<0.05$). Overall 122/324 (37.7%) regularly took drugs known to cause constipation.

DISCUSSION

This initial study of patients who have consulted doctors for their subjective feeling of constipation shows that subjective feeling is at variance with definition of constipation by stool frequency and form. The main difference with Rome III criteria of FC and IBS-C in Indian patients complaining of constipation also lies both in frequency and form of stool. Overall 64.6% of our patients had normal stool

frequency and 32.1% normal stool form (BSS type 3,4) by Western criteria. Similar data was reported in a previous population based Indian study evaluating lower gastrointestinal symptoms (which included 637 controls and 398 cases from the present study area) where of 53% patients complaining of constipation, only 19% had true constipation by Western criteria and 64% had normal stool frequency [11]. Indian diet usually contains food with high fiber intake like chapatti, vegetables. Stool weight in Indians is also higher than West [16]. These factors lead to short colonic transit time and softer stool so that the frequency of defecation even in those with constipation is higher than the West. This fact is reflected in another recent Indian study evaluating bowel habit in the general population where the prevalence of constipation by stool frequency was very low (2.6%) by Western definition (<3/week) while it was 8.8% by Indian definition (<1/day). The corresponding figures for stool forms were 5.1% (BSS type1-2) and 13.3% (BSS type1-3), most patients pass type 4 stool [15]. Since this study was conducted in the state neighbouring that of the present study (about 450 km distance) with very similar dietary and sociocultural habits, both these studies can be considered as control group for comparing data. The main difference of the present study from these two studies done in the general population is that it is carried out only in patients whose constipation was bothersome enough for medical consultation and hence likely to reflect more objective data on the symptom. It is common knowledge that constipation increases with age and 65% of our patients were above 60 years of age. This is an indirect proof of the representation of our patient cohort. This may also be the reason why colon cancer appears slightly higher.

Stool form (e.g. harder BSS Type 1-3 stool) is also important in the subjective feeling of constipation. In the present study BSS Type 1-3 stool was passed by 93.8% subjects and endorses the Asian criteria for constipation. 51.5% of patients with constipation had stool frequency of 3-4/week hence a frequency of less than 5/week (rather than 7/week) appears more indicative of constipation in these subjects. In the recent MIIBS study [17], 19.7% and 40.5% patients could be classified into IBS-C based on stool frequency and form respectively, 77.6% had normal stool frequency. An interesting fact is that in defining IBS-C, patient number increased from 16 to 28 if BSS Type 1-3 is considered instead of Type 1-2 (as in Rome III criteria). A study from Israel [18] showed that just by changing the frequency requirement for symptoms from 25% to 10%, the prevalence of IBS increased with corresponding decrease in FC keeping overall prevalence of functional bowel disease constant. Feeling of incomplete evacuation was reported by 98.8% and may reflect the feel of constipation in Indian subjects. These factors should be considered while defining constipation in the Indian context.

Previous Indian studies [11,15,17] showed constipation to be more prevalent in elderly females and IBS in males. Our study showed male preponderance in both IBS-C and FC group. BSS Type 1 and 2 being the predominant stool form in patients of FC appears logical considering their advanced age compared to others. A recent hospital based Indian study evaluating constipation by Rome III criteria found FC in 58%, and IBS-C in19% with male preponderance [19], figures matching our results.

Last of all, co-morbidities and drugs also appear to have their share to contribute to constipation especially in the elderly (60 years and above, [Table/Fig-3]).

CONCLUSION

This initial conceptual study evaluating Indian patients consulting doctors for bothersome constipation shows that BSS types 1-3 and stool frequency of less than 5/week are good markers of constipation in this population. Feeling of incomplete evacuation should be given due weightage. Most constipated patients are elderly with secondary co-morbidities. All these factors need to be considered while defining constipation in India and conducting population based studies on the subject. Colon cancer rarely presents with constipation only.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Jul 02, 2015**
Date of Peer Review: **Jan 29, 2016**
Date of Acceptance: **Feb 04, 2016**
Date of Publishing: **Apr 01, 2016**