

A Constipation Scoring System to Simplify Evaluation and Management of Constipated Patients

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PURPOSE: Constipation is a common complaint; however, clinical presentation varies with each individual. The aim of this study was to assess a standard scoring system for evaluation of constipated patients. **MATERIALS AND METHODS:** All consecutive patients with idiopathic constipation who were referred for anorectal physiologic testing were assessed. A subjective constipation score was calculated based on a detailed questionnaire that included over 100 constipation-related symptoms. Based on the questionnaire, scores ranged from 0 to 30, with 0 indicating normal and 30 indicating severe constipation. The constipation score was then compared with the objective findings of the physiology tests, which include colonic transit time (CTT), anal manometry (AM), cindefecography (CD), and electromyography (EMG). Colonic inertia was defined as diffuse marker delay on CTT without evidence of paradoxical contraction on AM, CD, or EMG. Pelvic outlet obstruction was defined as paradoxical puborectalis contraction, rectal prolapse or rectoanal intussusception, rectocele, or sigmoidocele. **RESULTS:** A total of 232 patients (185 females and 47 males) of a mean age of 64.9 (range, 14–92) years were evaluated. All patients had a score of more than 15; on evaluation of the significance of different symptoms in the constipation score with the Pearson's linear correlation test, 8 of 18 factors were identified as significant ($P < 0.05$). These factors included frequency of bowel movements, painful evacuation, incomplete evacuation, abdominal pain, length of time per attempt, assistance for evacuation, unsuccessful attempts for evacuation per 24 hours, and duration of constipation. All 232 patients had objective obstruction attributable to one or more of the following causes: paradoxical puborectalis contraction (81), significant rectocele or sigmoidocele (48), rectoanal intussusception (64), and rectal prolapse (9). **CONCLUSION:** The proposed constipation scoring system correlated well with objective physiologic findings in constipated patients to allow uniformity in assessment of the severity of constipation. [Key words: Constipation; Colonic inertia; Sigmoidocele; Rectocele; Rectal prolapse; Rectoanal intussusception; Anismus; Paradoxical puborectalis contraction]

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The clinical presentation of constipation includes a broad spectrum of symptoms partially attributed to the myriad etiologies. Specifically, constipation may result from slow transit, pelvic outlet obstruction, or other mechanical, pharmacologic, metabolic, endocrine, and neurogenic reasons.^{1,2} Generally, physicians use the term "constipation" to define infrequent, incomplete, difficult, or prolonged evacuation or to describe stools that are too small, too hard, or too difficult to pass.³ However, many patients are more obsessed by the associated nonspecific symptoms of bloating, abdominal, and pelvic pain and nausea.⁴ Other difficult to categorize problems, such as incontinence, have been better described using a scoring system.⁵

Therefore, the aim of this study was to establish an objective constipation scoring system based on patients' complaints. Specific attention was paid to both subjective symptomatic complaints and physiologic findings.

MATERIALS AND METHODS

A consecutive series of 232 constipated patients were enrolled in this study. Patients were interviewed by a nurse or a resident regarding their bowel habits. The standardized questionnaire concerned 12 addressed items, including constipation duration and severity, bowel habits, stool consistency, intake of fiber, frequency and amounts of laxatives, suppositories, digitation or enemas, duration and frequency of assistance, length of straining time per attempt, unsuccessful attempts for evacuation per 24 hours, sensation of incomplete evacuation, mucus discharge, rectal bleeding, sensation of prolapse, incontinence, psychologic, endocrinologic, metabolic, or neurologic history, previous abdominal, gynecologic, or colorectal surgery, pelvic irradiation, regular use of medication, pregnancy, and vaginal deliveries.

All patients underwent extensive anorectal exami-

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nation, including inspection, digital examination, anoscopy, and proctosigmoidoscopy before treatment. In addition, patients underwent anal and colorectal physiologic studies including colonic transit time, cindefecography (CD), anal manometry, and electromyography (EMG). These studies were performed as previously described.^{1,6,7} When indicated, all patients underwent a comprehensive evaluation such as barium enema, colonoscopy, biochemical and metabolic profile, small bowel transit, or psychiatric consultation to exclude organic causes of constipation.

Definitions

Colonic inertia has been defined as the presence of at least 80 percent of transit markers scattered diffusely throughout the colon on the fifth day after ingestion.⁸ Patients with paradoxical puborectalis contraction, rectoanal intussusception, sigmoidocele, rectocele, or rectal prolapse were classified as having pelvic outlet obstruction.⁹⁻¹³ Paradoxical puborectalis contraction was defined by the finding of at least two of the three following abnormalities: retention of at least 20 percent of the colonic markers in the rectum on the fifth day of the colonic transit time study, inability to achieve rapid and complete evacuation of 200 ml (500 g) of barium paste on CD with lack of a measurable increase in the anorectal angle between radiographic views taken at rest and during attempted evacuation, and a paradoxical increase in puborectalis neuromuscular activity during EMG. Rectoanal intussusception was defined as a circumferential infolding of more than 4 mm of rectal mucosa.¹⁴ Sigmoidocele was defined as a deep rectovaginal fossa with an elongated loop of sigmoid extending caudally.¹⁵ It was diagnosed and classified based on the degree of descent of the lowest portion of the sigmoid on CD. Rectocele is a herniation of the anterior rectal and posterior vaginal walls into the lumen of the vagina. A rectocele was defined as any herniation of 3 cm or more in diameter occurring during defecation or straining. Rectal prolapse was defined as procidentia of the full thickness of the rectum through the anal canal. Sigmoidocele, rectocele, intussusception, and prolapse were all diagnosed by CD.

Constipation Scoring System

The constipation scoring system was derived based on answers to the questions in the symptom questionnaire.

Statistical Analysis

Pearson's correlation coefficient analysis was used to compare quantified values and the unpaired *t*-test when qualitative data were required. Association of qualitative values were verified by chi-squared analysis with Yates' correction, when possible. Statistical significance was $P < 0.05$.

RESULTS

A total of 232 patients (185 women and 47 men) with a mean age of 64.9 (range, 14-92) years was assessed. All patients had a diagnosis of constipation, with a mean duration of 16.8 years (range, 3 months-72 years). Colonic transit time, anal manometry, EMG, or CD confirmed the presence of constipation in all patients. Sixty-eight of these 232 patients had colonic inertia, and 164 had pelvic outlet obstruction attributable to one or more of the following: paradoxical puborectalis contraction (81), rectoanal intussusception (64), sigmoidocele (36), rectocele (48), and rectal prolapse (9).

Based on statistical analysis, eight variables were selected for the scoring system. These items include frequency of bowel movements, painful evacuation, incomplete evacuation, abdominal pain, length of time per attempt, assistance for defecation, unsuccessful attempts for evacuation per 24 hours, and duration of constipation (Table 1). A scoring range of 0 to 4 (with the exception of "assistance for defecation," which is 0-2) was derived. The global score was obtained by adding each individual score. A score of more than 15 was the definition of the symptom "constipation" in this study. Patients with etiologies based on mechanical, pharmacologic, metabolic, endocrine, or neurogenic reasons were excluded.

Pearson's linear correlation test estimated the severity of constipation using these eight parameters; however, these parameters can be biased by the study groups' criteria and characteristics. To prevent this error, a validation sample was established. Before evaluating all cases, pilot groups of 50 constipated and 50 nonconstipated patients confirmed by physiologic studies were randomly selected. This study correctly predicted the actual results (Table 2). This pilot group validated the accuracy of the constipation scoring system, and subsequently, the entire study group was assessed. Using the Pearson's linear correlation test, eight of the generated factors had a significance level of $P < 0.05$; 97 percent of the entire group had a score greater than 15.

Table 1.
Constipation Scoring System (Minimum Score, 0;
Maximum Score, 30)

Frequency of bowel movements	Score
1-2 times per 1-2 days	0
2 times per week	1
Once per week	2
Less than once per week	3
Less than once per month	4
Difficulty: painful evacuation effort	
Never	0
Rarely	1
Sometimes	2
Usually	3
Always	4
Completeness: feeling incomplete evacuation	
Never	0
Rarely	1
Sometimes	2
Usually	3
Always	4
Pain: abdominal pain	
Never	0
Rarely	1
Sometimes	2
Usually	3
Always	4
Time: minutes in lavatory per attempt	
Less than 5	0
5-10	1
10-20	2
20-30	3
More than 30	4
Assistance: type of assistance	
Without assistance	0
Stimulative laxatives	1
Digital assistance or enema	2
Failure: unsuccessful attempts for evacuation per 24 hours	
Never	0
1-3	1
3-6	2
6-9	3
More than 9	4
History: duration of constipation (yr)	
0	0
1-5	1
5-10	2
10-20	3
More than 20	4

After establishing the constipation scoring system, two control groups were created. Group I consisted of 30 patients who were not constipated as confirmed by physiologic studies. Group II consisted of 30 controls who did not undergo any physiologic studies. All

samples in both groups had scores under 8, with a mean score of 2.1 in Group I and 3.4 in Group II.

DISCUSSION

Constipation is a common clinical complaint but a poorly defined clinical constellation. It is difficult to describe normal bowel function but most people evacuate between three times per day and once every three days.² Marginal infrequency beyond this may be attributed to poor diet and frequently responds to bulk laxatives. Recent demographic studies have shown that 2 percent of the population in the United States is affected by constipation.³ If conventional investigations do not reveal any causative abnormality, constipation is considered to be functional, which makes application of functional tests that assess anal and anorectal function mandatory for further evaluation.^{16, 17}

Several prior attempts have been made to study constipation. Drossman and coworkers¹⁸ surveyed 789 students and hospital employees and found that 17.5 percent strained at stool more than 25 percent of the time. Moreover, 4.2 percent reported two or fewer bowel movements per week. These figures were slightly higher than Thompson and Heaton¹⁹ reported in an earlier survey. Although the survey by Drossman and colleagues¹⁸ queried abdominal pain, distention, and incomplete evacuation, it did so in the context of diagnosis of irritable bowel syndrome rather than constipation. Much data have been published regarding psychological abnormalities in patients with constipation.²⁰⁻²³ One prior publication included a comparison of symptoms and type of constipation.²⁴

In 1991, Pemberton *et al.*²⁵ clearly demonstrated the importance in differentiating between slow transit constipation and pelvic floor dysfunctions. Specifically, they found that 10 percent of a group of 277 thoroughly investigated, constipated patients had slow transit constipation; 13 percent had pelvic floor dysfunction, and 5 percent had both. The overwhelming majority of patients (70 percent) had irritable bowel syndrome. Thus, although the success rate of surgery for constipation was high in that series, the authors cautioned against performing such surgery in patients with irritable bowel syndrome.

Subsequently, that same group sought to classify 184 patients into one of the aforementioned groups based on psychological distress and colorectal symptoms.²⁴ After a thorough evaluation, the authors were unable to assign significance to correlation between

Table 2.
Validation Sample (100 Cases)

	Predicted Constipation	Unpredicted Constipation
Confirmed constipation	49	1
Unconfirmed constipation	3	47

A total of 96% of cases were correctly predicted ($P < 0.05$).

symptoms and type of constipation. Significant correlation included normal transit constipation with increased depression scores, general severity index with total colonic transit, and a feeling of anal blockage with pelvic floor dysfunction.

This study demonstrates the use of a constipation scoring system in assessing patients with constipation. It also confirms the unreliability of some of the parameters when they are used alone to define constipation. For example, stool frequency is modulated by the voluntary and subjective components of defecation and does not correlate with transit times, also taking into account stool weight and thus reflects better stool output.

The patients in this study showed two different profiles. Patients in the colonic inertia group were predominantly females, with a chronic history of constipation unresponsive to numerous treatment regimens. They reported abdominal distention and discomfort between infrequent evacuations. They were unable to have spontaneous evacuations and generally experienced better results with laxatives than with enemas, suppositories, or digitation.

In the pelvic outlet group, a combination of findings was observed, including a history of difficult and incomplete evacuation, which often requiring digitation. This group of patients was unable to have spontaneous bowel evacuations and generally experienced better results with enemas, suppositories, and digitation than with laxatives.

In our series of 232 patients, we defined eight parameters that were significant in predicting constipation, as described earlier in this study report. After identifying the significant parameters and establishing the scoring system, patients were scored. As scores increased, a corresponding significant increase in severity of constipation was noted, thus validating the applicability of this constipation scoring system. Thus, the current study had a different design than either of the two previous symptom-related surveys.^{18, 24}

CONCLUSION

Development of a constipation scoring system was derived to obtain a universally objective definition of "constipation" to assist in the diagnosis and treatment of constipated patients. Initial clinical validation proved this scoring system to be accurate. Further prospective evaluation is warranted to ascertain impact on therapeutic decision-making.

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