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Fecal Urgency is common in constipated patients and is associated with anxiety

DR Prashant Singh, MD[1], **Eve Takazawa**[1], **DR Vikram Rangan, MD**[1], **Sarah Ballou, PhD**[1], **Jesse Katon, BS**[1], **Courtney McMahon, BS**[1], **Ha-Neul Lee, BS**[1], **Johanna Iturrino, MD**[1], **Judy Nee, MD**[1], and **DR Anthony Lembo, MD**[1]

[1]Division of Gastroenterology, Department of Medicine, Beth Israel Deaconess Medical Center, Boston, MA, USA

Abstract

Background: Fecal urgency is a symptom generally associated with diarrhea but is also reported by patients with constipation. Our aim was to i) assess the prevalence and burden of fecal urgency in constipated patients ii) evaluate gastrointestinal and psychiatric predictors of moderate to severe fecal urgency in these patients.

Methods: Patients presenting consecutively to a tertiary outpatient gastroenterology clinic with constipation were included. Patients were considered to have moderate to severe fecal urgency if ≥50% of bowel movements (BMs) in the past 3 months were associated with fecal urgency. Anxiety, depression, and sleep disturbance were diagnosed using a Patient Reported Outcomes Measurement Information System (PROMIS) t-score of ≥60. Abdominal pain and constipation severity were also assessed using PROMIS questionnaires. Univariable and stepwise logistic regression were used to identify predictors of moderate to severe fecal urgency.

Key Results: Of 139 constipated patients, 70.8% reported experiencing fecal urgency in the past 3 months and 25.8% reported being significantly bothered by it. Moderate to severe fecal urgency was reported by 27% of 139 patients. Frequency of loose stools (OR 1.5, 95% CI 1.1, 2.0) and presence of anxiety (OR 2.3, 95% CI 1.1, 5.0) were independent predictors of moderate to severe fecal urgency.

Conclusions &Inferences: Fecal urgency is common in patients with constipation and is frequently bothersome to many patients. We identified clinical and psychiatric factors associated with moderate to severe fecal urgency in constipated patients with potential therapeutic implications if validated in future studies.

Abbreviated abstract:

Guarantor of the article: Anthony Lembo, MD, Division of Gastroenterology, Department of Medicine, Beth Israel Deaconess Medical Center and Harvard Medical School, Boston, Massachusetts, USA., alembo@bidmc.harvard.edu.

Author Contribution: P.S., A.L., and J.N. conceived the idea of the study. P.S., E.T., J.K. contributed to data entry. The manuscript was drafted by P.S. Statistical analysis was performed by P.S. The draft manuscript was critically reviewed by E.T., J.K., S.B., V.R., C.M., H.L., J.I., A.L., and J.N. All authors reviewed and approved the final version of the manuscript.

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Fecal urgency was reported by 71% of patients with constipation and about a quarter of those were significantly bothered by it. Furthermore, moderate to severe fecal urgency (i.e. urgency with at-least 50% of bowel movements in the past 3 monts) was reported by 27% of constipated patients. Higher frequency of loose bowel movements and presence of anxiety were independent predictors of moderate to severe fecal urgency.

Introduction

Fecal urgency is commonly defined as the sudden need to rush to the bathroom to empty one's bowels.[1] It is a common and sometimes debilitating symptom of diarrheal diseases, including inflammatory bowel disease and diarrhea predominant irritable bowel syndrome (IBS-D).[2,3] In a survey of 1,094 women diagnosed with IBS-D, 64% of patients reported fecal urgency to occur always or most of the time.[2] Fecal urgency is one of the most bothersome symptoms in patients with IBS-D.[1,4,5] Patients with IBS-D cite the ability to relieve fecal urgency among the most important goals of therapy.[6] Additionally, fecal urgency is closely associated with fecal incontinence.[7,8]

While fecal urgency is generally thought of as a symptom associated with diarrhea, it is also present both in individuals with normal stool consistency and with constipation.[9] Using a nationally representative adult population, we recently showed that up to 70% of individuals with fecal urgency do not have associated diarrhea.[9] Although specific estimates of fecal urgency in patients with constipation are lacking, Mangel et al reported that 45–50% of patients with IBS-C reported fecal urgency.[10] Heaton et al also reported urgency with 32.8% of Bristol stool form scale (BSFS) type 2 stools among IBS patients.[11] While studies have investigated the burden of fecal urgency in IBS-D, the prevalence and impact of fecal urgency on patients with constipation have not been studied.[1]

The pathophysiology of fecal urgency, particularly in patients with constipation, is not well understood. Factors associated with urgency differ between individuals with and without diarrhea, suggesting that the pathophysiology of urgency is not related to stool consistency alone.[9] However, this study was done in the general population and was not specific to patients seeking care for bowel dysfunction.[9] It also lacked detailed assessment of psychiatric and somatic comorbidities, which are very common in patients with functional gastrointestinal disorders.[9,12,13] These psychosomatic factors have been shown to be associated with gastrointestinal symptom severity and visceral hypersensitivity, which in turn could be associated with fecal urgency.[12,14]

The goal of this study was to assess the prevalence and burden of fecal urgency in patients with the chief complaint of constipation at a tertiary care center. We also aimed to understand gastrointestinal and psychiatric predictors of moderate to severe fecal urgency in these patients.

Materials and Methods

Patients

All new patients (n=415) presenting to the outpatient Center for Functional Bowel Disorders and GI Motility at Beth Israel Deaconess Medical Center, Boston between October 2017 and July 2018 filled out a detailed symptom survey sent electronically before their initial visit. The aim of this survey was to assess the presence and severity of various gastrointestinal and psychiatric symptoms using validated questionnaires (detailed below). Data was collected and stored via Research Electronic Data Capture (REDCap), a HIPAA compliant, free, secure, web-based application. Ethics approval was obtained from Institutional review board.

Online medical records of patients who filled out electronic survey were reviewed (PS). Of the 415 new patients, 139 diagnosed with “Constipation predominant Irritable bowel syndrome (IBS-C)” or “Functional constipation” by their treating physicians were eligible to be included in the study.

Measurement of Urgency—The frequency of fecal urgency was assessed using the following question - “In the last 3 months, how often did you have to rush to the toilet to have a bowel movement?” and answers were scored in terms of the percentage of bowel movements associated with this feeling.[15] As there is no standardized definition for moderate to severe fecal urgency, it was defined a priori as rushing to the toilet to have a bowel movement for at least 50 % of bowel movements in the last three months. This definition has been previously used as an inclusion criteria for drug trials aimed to achieve satisfactory control of fecal urgency in patients with IBS-D.[5] The bothersomeness and interference of urgency was measured using these two questions - “In the last 7 days, how much has the feeling that you needed to empty your bowels right away bothered you” and “In the last 7 days, how much has the feeling that you needed to empty your bowels right away interfered with your life”. Both questions were answered on a 5-point scale ranging from “not at all”, “a little bit”, “somewhat”, “quite a bit” and “very much”.

Constipation related questions

Symptoms of constipation- hard stools (defined by presence of Bristol 1 or 2 stools), straining, incomplete evacuation, sensation of anal blockage, infrequent bowel movements (defined by <3 bowel movements per week) and digitalization were considered present if they were reported in >25% of bowel movements in the last three months. [15]

Severity of diarrhea—Diarrhea symptoms can often co-exist with those of constipation, particularly in patients using laxatives, which have been shown to increase the risk of diarrhea by up to 13-fold compared to placebo.[16] Given that diarrhea has been associated with fecal urgency, we measured the severity of diarrhea in our patients with constipation. Severity of diarrhea was assessed by asking the question “In the last 7 days, how many days did you have loose or watery stools”. Patients reported on a 5-point scale – “No days,” “1 day”, “2 days”, “3–5 days”, or “6–7 days”.

Patient Reported Outcomes Measurement Information System (PROMIS)—The Patient Reported Outcomes Measurement Information System (PROMIS) is a National Institutes of Health (NIH) set of tools used to provide information on patient outcomes in a variety of fields.[17]

Gastrointestinal PROMIS scales: PROMIS scales of Belly pain and constipation were administered to assess the severity of belly pain and constipation in our patients.[17] PROMIS Belly pain questionnaire and PROMIS constipation questionnaire have five and nine questions, respectively, both of which assess symptom severity on a 5 point Likert scale. Higher T-scores on these questionnaires refer to more severe gastrointestinal symptoms.[17]

Non-gastrointestinal PROMIS scales: Each patient also filled out PROMIS Anxiety 7a, Depression 8a, and Sleep Disturbance 6a questionnaires.[18] The PROMIS Anxiety Scale 7a short form and PROMIS Depression Scale 8a short form consist of seven and eight questions, respectively, and each question has a 5 point Likert scale. The PROMIS Sleep Disturbance questionnaire consists of six questions with similar response options.

For each questionnaire, the total raw score was calculated by summing the response values to each question. The total raw score was transformed to standardized T-score distribution as suggested by the scoring manual. This distribution has been established such that the mean value for the healthy US population is 50 and the standard deviation (SD) represents variation of 10 [19] Anxiety, depression and sleep disturbance were defined as a T-score ≥60.

Patient Health Questionnaire—The Patient Health Questionnaire 15 (PHQ-15) is a self-administered, validated measure of somatization among patients. It consists of 15 somatic symptoms and each symptom is scored from 0 (not bothered at all) to 2 (bothered a lot) in the past four weeks. [20] PHQ-15 was used as a continuous score and higher scores suggested higher somatization.

Statistical Analysis

Statistical analysis was performed used Stata 13.0. Mean and median were reported with 95% confidence interval (CI) and interquartile range (IQR). Mean and median were compared using Students' t-test and Wilcoxon ranksum test, respectively. Proportions were compared using chi-square test. The predictors of moderate to significant urgency were determined using a commonly used stepwise logistic regression process. Based on the results of unadjusted logistic regression models, all variables with $P< 0.2$ were included in a multivariable logistic regression model and retained in the model if still significant at this level. Those with P values ≥ 0.2 in the crude analyses were added back to the multivariable model one at a time. In the final model, we only retained variables that were significantly ($P=0.05$) associated with our outcome. This manual variable selection procedure was confirmed with automatic backward and forward stepwise selection using the Stata-command "sw" (step wise regression). In the final model, we only retained variables that were significantly ($P <0.05$) associated with our outcome.

Results

There were 139 patients diagnosed with constipation during the study period. Two patients did not answer the question pertaining to fecal urgency and were not included in the study. Of the remaining 137 patients, the majority (80.3%) were female and the mean age (SD) was 43 years (± 17.1 years). Of these, 54 patients (39.4%) were clinically diagnosed with IBS-C and the remaining (60.6%) with functional constipation. About half the patients (69 patients, 50.4%) were on laxatives at the time of their visit. Anxiety and depression were present in 35.8% and 16.1% of patients respectively. (Table 1).

Of 137 constipated patients, 67 (48.9%) reported diarrhea (loose or watery stools) in the last seven days. The proportion of patients using laxatives was not higher proportion among those with diarrhea compared to those without diarrhea (56.7 vs. 44.3, P=0.15). However, the proportion of patients using secretagogues (e.g. Lubiprostone, Linaclotide, Plecanatide) was significantly higher among those with diarrhea (19.1%) compared to those without any diarrhea (1.4%, P=0.001). Similarly, the proportion of patients using rectal therapies (such as suppositories, enemas) was also significantly higher among those with diarrhea (11.8%) compared to those without diarrhea (2.8%, P value = 0.04). The proportion of other laxatives such as osmotic laxatives, stool softeners, oral stimulant laxatives, fiber) did not differ significantly between the two groups. Those with diarrhea were more likely to have diagnosis of IBS-C compared to those who did not have diarrhea (47.8% vs. 31.4%, P=0.051).

Prevalence of moderate to severe urgency

Fecal urgency was reported by 97 patients (70.8%). The median frequency of fecal urgency was 10% (IQR 0, 40%) of the bowel movements in the last 3 months. 37 patients (27.0%) met our study's definition for moderate to severe fecal urgency (defined as urgency associated with ≥ 50% of bowel movements in the last three months).

Burden of urgency

Among the patients who reported fecal urgency (N=97), 25 (25.8%) reported that fecal urgency bothered them "quite a bit" or "very much" in the last seven days. Eighteen patients (18.6%) reported that sensation of fecal urgency interfered with their day to day activities "quite a bit" or "very much" in the last seven days.

Univariate analysis

The factors analyzed in univariate analyses are listed in Table 2. There were no significant differences in age and gender in the two groups. The mean severity of abdominal pain and constipation was similar in those with moderate to severe fecal urgency and those without (Table 2). The mean number of days of loose stools in the last 7 days was significantly higher in those with moderate to severe fecal urgency compared to those without (2.6 days vs. 1.2 days, P=0.002). The proportion of patients with anxiety was significantly higher in those with moderate to severe fecal urgency (51.4% vs. 30%, P=0.02). Prevalence of depression and sleep disturbance were not different between the two groups (Table 2).

Stepwise regression

On stepwise logistic regression, frequency of diarrhea (OR 1.5, 95% CI 1.1, 2.0) and presence of anxiety (OR 2.3, 95% CI 1.1, 5.0) were significant independent predictors of moderate to severe fecal urgency.

Discussion

This is the first study to systematically investigate the prevalence, burden and predictors of fecal urgency in patients presenting with constipation. Although generally associated with diarrhea, fecal urgency was reported by 71% of patients with constipation and about a quarter of those were significantly bothered by it. Furthermore, moderate to severe fecal urgency (i.e. urgency with at-least 50% of bowel movements) was reported by 27% of constipated patients. Higher frequency of loose bowel movements and presence of anxiety were independent predictors of moderate to severe fecal urgency.

The proportion of patients reporting fecal urgency in our cohort (71%) was significantly higher than that reported in previous studies (32–50%).[10,11] This was likely because we assessed the prevalence of fecal urgency over the last 3 months while the previous studies had assessed this over a shorter duration (24 hours to 31 days).[10,11] In addition, more than a quarter of patients with constipation in our cohort also reported moderate to severe fecal urgency. While this is lower than the proportion of patients with IBS-D reporting moderate to severe fecal urgency (64%), it is much higher than that reported in the general population (3.3%).[2,9]

One-fourth of patients with constipation who reported fecal urgency were significantly bothered by it. About 18.6% of constipated patients with fecal urgency also reported related significant interference with their day to day activities. As fecal urgency is commonly considered as one of the most bothersome symptoms of IBS-D, clinicians might overlook its impact on quality of life in patients with constipation. Given its high prevalence and significant impact, clinicians should inquire about fecal urgency in all patients with bowel dysfunction.

Data on factors associated with fecal urgency in patients with bowel dysfunction is scarce. Using a national database, we have shown earlier that stool frequency is significantly associated with fecal urgency even in individuals without diarrhea.[9] In the current study, we found that higher frequency of diarrhea was significantly associated with fecal urgency in patients with constipation. In the last decade, there has been a significant increase in FDA approved pharmacological treatment options for patients with constipation. Although highly efficacious, these drugs are commonly associated with diarrhea.[21] We found that constipated patients who reported diarrhea in the past seven days were more likely to use secretagogues or rectal therapies than those who did not report any diarrhea. Clinicians should assess the burden of diarrhea in patients with constipation and, if present, laxatives should be titrated to achieve stool consistency as close to normal as possible.

We also showed that anxiety is significantly associated with fecal urgency in patients with constipation. This is a novel finding and aligns with a prior study indicating that anxiety (but

not depression or somatization) is associated with increased intensity of non-painful rectal sensations such as rectal urgency on balloon distention.[22] We have previously reported that depression was significantly associated with fecal urgency in individuals without diarrhea but not in those with diarrhea.[9] The lack of association between depression and urgency in the present study could be due to use of standardized, validated questionnaires used to measure the burden of psychiatric comorbidities compared to self-reported depression in our previous study.[9] Basilisco et al did not find a correlation between psychologic profile and urgency.[23] However, only 28 IBS patients in the study were included, consisting of individuals with both diarrhea and constipation.[23] As suggested in previous studies, mechanisms underlying urgency likely vary between those with and without diarrhea, which could explain the lack of association between psychological profile and urgency in their study.[9]

It is important to note that a causal association between anxiety and urgency could not be established based on our data given the cross-sectional nature of study-design. Future studies are needed to investigate this association further as this finding could have therapeutic implications. If validated in future studies, neuromodulators or referral to psycho-gastroenterology services could be used to target anxiety (if present) for treatment of significant fecal urgency.

Our study has several limitations. First, our data is from a tertiary care center and there is a possibility of selection bias. We did not utilize Bristol stool form scale to assess the most common stool form in the last seven days prior to the visit. Frequency of stool forms other than watery or loose stools was also not assessed in the last seven days prior to the visit. In addition, we could have missed a few associations given a relatively small sample size. Despite these limitations, our study has many strengths. It is the first study to our knowledge to estimate the prevalence and impact of fecal urgency in patients with constipation and we had detailed data on their gastrointestinal and psychiatric symptoms using validated questionnaires.

In conclusion, the majority of patients with constipation report fecal urgency and more than a quarter report moderate to severe fecal urgency. In contrast to common perception, fecal urgency is bothersome to a significant proportion of constipated patients. Higher frequency of diarrhea and presence of anxiety were independent predictors of moderate to severe fecal urgency

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Key Points:

- Fecal urgency is commonly considered a symptom of diarrheal diseases but is also reported by patients with constipation. However, data on the prevalence, burden and factors associated with fecal urgency in constipation are scarce.
- We found that fecal urgency is common in patients with constipation and a significant proportion of patients are bothered by it.
- Frequency of loose stools and presence of anxiety were predictors with fecal urgency in constipated patients.

Table 1:

Demographic and clinical characteristics of study population

Demographic characteristics	N=137
Age (years)	**43 (17.1)**
Gender	
Female	**110 (80.3%)**
Male	**27 (19.7%)**
Clinical Diagnosis	
IBS-C	54 (39.4%)
Functional Constipation	83 (60.6%)
Bowel symptoms*	**N (%)**
Straining	100 (73)
Hard	79 (57.7)
Incomplete evacuation	100 (73)
Anal blockage	80 (58.4)
Digitalization	45 (32.8)
Infrequent bowel movements	75 (54.7)
Psycho-somatic**	**N (%)**
Anxiety	49 (35.8)
Depression	22 (16.1)
Sleep disturbance	32 (23.4)

* Symptoms considered present if reported with >25% of bowel movements in the last three months

** Defined by PROMIS T-score ≥60

Table 2:

Demographic and clinical features in patients with moderate to severe fecal urgency compared to those with no or mild fecal urgency

Demographic and clinical variables	No or mild fecal urgency (n=100)	Moderate to severe fecal urgency* (n=37)	P value
Female gender	79 (79)	31 (83.8)	0.53
Age (in years)	43.1 (17.1)	42.6 (17.2)	0.89
Mean abdominal pain T-score	58.6 (10.6)	60.3 (13.9)	0.44
Mean constipation T-score	57.9 (8.3)	60.7 (8.8)	0.11
Mean number of days with frequent loose stools	1.8 (1.2)	2.6 (1.4)	**0.002**
Laxative use at the time of visit	49 (49%)	20 (54.1%)	0.6
Anxiety	30 (30%)	19 (51.4%)	**0.02**
Depression	14 (14%)	8 (21.6%)	0.28
Sleep disturbance	24 (24%)	8 (21.6%)	0.77
Mean somatization score	10.6 (5.1)	12.0 (6.2)	0.18

* Moderate to severe fecal urgency defined as fecal urgency in ≥50% of bowel movements in the last 3 months