Stool patterns and symptoms of disordered anorectal function in patients with inflammatory bowel diseases

Paweł W. Petryszyn^{1,A–E}, Leszek Paradowski^{2,A,E,F}

¹ Department of Clinical Pharmacology, Faculty of Pharmacy with Division of Laboratory Diagnostics, Wrocław Medical University, Poland

² Department of Gastroenterology and Hepatology, Faculty of Postgraduate Medical Training, Wrocław Medical University, Poland

A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation;

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Address for correspondence

Paweł Petryszyn

E-mail: ppetryszyn@wp.pl

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Abstract

Background. Crohn's disease (CD) and ulcerative colitis (UC) typically clinically manifest with symptoms like chronic diarrhea, cramps, abdominal pain, and rectal bleeding. However, symptoms of abnormal anorectal function seem to be of equal importance, regardless of the presence or absence of perianal disease.

Objectives. The aim of this study was to assess stool patterns and the prevalence of symptoms of disordered anorectal function, particularly urgency and fecal incontinence, and their severity in patients with inflammatory bowel diseases (IBDs).

Material and methods. Thirty-three patients with CD and 38 patients with UC completed a questionnaire. A push/strain maneuver was performed on all patients and 20 controls.

Results. Thirty-three patients had more than 3 bowel movements a day; 44 had loose/watery stools. Two patients had fewer than 3 bowel movements a week, 8 had hard/lumpy stools, and 3 used laxatives. Excessive straining and incomplete evacuation were reported by 17 and 38 patients, respectively. Fifty-two patients complained of urgency and 32 of tenesmus. Significantly, more UC patients than CD patients had urgency at least once a day ($p < 0.04$). The following symptoms were reported by patients in the following numbers: fecal incontinence (31), passive (20) and urge incontinence (16), incontinence to gas (24), as well as liquid (33) and solid stool (7). Stool/gas discrimination was defective in 28 patients. Eleven patients had to wear pads. Everyday functioning was worsened because of urgency/tenesmus in 39 patients and because of fecal incontinence in 28 patients. The push/strain maneuver was abnormal in 12 patients with CD, 15 patients with UC and 1 control subject. The differences between the 2 study groups and the controls were significant ($p < 0.03$ and $p < 0.01$).

Conclusions. A majority of patients with IBD complain of urgency. Fecal incontinence is reported by over 50% of patients. Both worsen patients' everyday functioning. A relevant proportion of patients have symptoms consistent with constipation, which is in connection with an abnormal push/strain maneuver in more than 1/3 of them.

Key words: high-resolution manometry, fecal incontinence, inflammatory bowel disease

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Introduction

Crohn's disease (CD) and ulcerative colitis (UC) belong to the group of inflammatory bowel diseases (IBDs). They typically clinically manifest with symptoms such as chronic diarrhea, cramps, abdominal pain, rectal bleeding, and low-grade fever. Some patients may even experience constipation, which is often overlooked when the frequent passage of blood and mucous is confused with diarrhea. The Rome III criteria for IBD are often met. In some patients with CD and UC, perianal diseases comprising ulcerations, fissures, abscesses, and fistulas are diagnosed. The symptoms of abnormal anorectal function, such as urgency, tenesmus and fecal incontinence, seem to be quite prevalent in patients with IBD, regardless of the presence or absence of perianal disease. These symptoms are extremely embarrassing, thus patients are unwilling to report them and very often doctors themselves do not ask about them. However, such symptoms may have a relevant impact on patients' quality of life that cannot be ignored.

Objectives

The aim of this study was to assess stool patterns and the prevalence of the symptoms of disordered anorectal function, urgency and fecal incontinence in particular, and their severity in patients with IBD.

Material and methods

Patients

Seventy-one patients with an established diagnosis of CD and UC, who were hospitalized in the Department of Gastroenterology and Hepatology of Wrocław Medical University, Poland, between 2007 and 2008, were included in this study. Patients who had had a diverting ileostomy or colostomy, colectomy or subtotal colectomy, colectomy with ileorectal anastomosis, or restorative proctocolectomy with ileal pouch-anal anastomosis (IPAA), were excluded. The control group consisted of 20 volunteers without any symptoms of the lower gastrointestinal tract diseases and without any relevant concomitant chronic diseases, like diabetes mellitus or neurological disorders. The study group was divided into 2 subgroups: group I – patients with CD ($n = 33$), and group II – patients with UC ($n = 38$). Twelve operations for IBD were performed in 10 patients with CD. In addition, 3 patients had a hemorrhoidectomy and 1 was operated on because of anal fissure. In the CD patients, the disease was localized in the ileum (Montreal L1) in 3 patients, in the colon (Montreal L2) in 16 patients, and in both the ileum and colon (Montreal L3) in 12 patients. Thirteen patients had only luminal inflammatory changes (Montreal B1), 14 developed strictures (Montreal B2) and in 4 patients the disease had penetrating

behavior (Montreal B3). Perianal disease (fistulas) was present in 3 patients. Among the UC group, in 4 patients IBD was restricted to the rectum (Montreal E1), 19 had left-sided UC (Montreal E2), and 13 patients presented extensive colitis (Montreal E3). A total of 15% of patients with CD and 42% of patients with UC were in clinical remission (Crohn's Disease Activity Index [CDAI] <150 and Rachmilewitz Index [IR] ≤ 4 , respectively). Patient characteristics and clinical details are shown in Table 1.

Table 1. Patient characteristics and clinical details

Characteristic	CD	UC	Controls
Studied	33	38	20
Men/women	20/13	18/20	8/12
Age [years]*	40.8 (18–81)	45.5 (18–74)	41.4 (20–65)
Time since diagnosis			
<1 year	17	12	–
1–8 years	10	15	–
>8 years	6	11	–
Medication			
Sulfasalazine	10	20	–
Mesalazine	20	23	–
Prednisone	12	14	–
Budesonide	1	2	–
Azathioprine	18	16	–

CD – Crohn's disease; UC – ulcerative colitis; * data expressed as mean (range).

Questionnaire

All patients completed a questionnaire consisting of 70 questions divided into 6 categories: general questions (demographic, social and professional, as well as concerning smoking, nutrition); questions concerning the underlying disease (time since diagnosis, onset of symptoms, management, presence of symptoms within the last 6 months, most troublesome symptom, abdominal pain and its relief after defecation); questions concerning bowel movements (frequency, consistency, straining during bowel movement, feeling of incomplete evacuation, use of antidiarrheals and laxatives, Bristol stool form scale by Heaton and Lewis, questions concerning urgency and tenesmus (prevalence, frequency, deferral time); questions about fecal incontinence (type of incontinence – passive or urge, fecal seepage, frequency of incontinence to gas, liquid and solid stool, incontinence at night, discrimination between stool and gas, wearing pads) as well as about the impact of the symptoms on the patient's everyday functioning; and questions about factors which may influence anorectal function (concomitant chronic diseases, medication, anorectal disorders, past abdominal and pelvic operations or perianal disease operations, radiotherapy).¹ The women

answered 9 extra questions related to gynecological and obstetrical factors. After receiving detailed instructions, patients were asked to fill in the questionnaire on their own. The mean response time was approx. 15 min. Whenever a patient was unsure or had doubts, we discussed the answers with the patient the following day. This way, we tried to minimize the bias associated with inaccuracy or misunderstanding.

Anorectal manometry

In all patients and the 20 controls, a push/strain maneuver was performed by means of anorectal manometry with the use of a 4-lumen water-perfused catheter (Zinectics Manometric Catheter; Medtronic, Minneapolis, USA). The patient was asked to bear down as if to defecate. The test was considered abnormal if there was a paradoxical increase or decrease of less than 20% of the baseline anal resting pressure.

Statistical analysis

Statistical analysis was performed with the use of STATISTICA v. 7.0 PL (StatSoft, Tulsa, USA). Proportions were compared using a χ^2 test; $p < 0.05$ was considered statistically significant.

Ethical considerations

Written informed consent from all study participants was obtained. The study was approved by the Bioethical Committee of Wrocław Medical University, Poland.

Results

Bowel movements

A total of 91% of patients with CD and 84% of patients with UC reported gastrointestinal symptoms within the last 6 months. The most common symptoms were abdominal pain, diarrhea and vomiting in CD, and diarrhea, rectal bleeding and bloating in UC. Over 40% of patients in both groups eliminated more than 3 stools a day in the week preceding hospitalization, and more than 60% of patients had loose or watery stools. Six of the CD patients and 10 UC patients used antidiarrheals. One patient with CD and 1 patient with UC had fewer than 3 stools a week; in 3 patients from group I and in 5 patients from group II, the stools were hard or lumpy. Approximately 25% of the patients reported excessive straining while passing stools and in 50% of the patients a feeling of incomplete evacuation was noted. The differences between groups I and II in the above-mentioned parameters characterizing bowel movements were not statistically significant (Table 2).

Table 2. Bowel movements (BMs) in patients with IBD

Characteristic		CD (n = 33)	UC (n = 38)	p-value
BMs	>3/day	15	18	ns
	≥6/day	3	8	ns
	<3/week	1	1	ns
	loose/watery	20	24	ns
	hard/lumpy	3	5	ns
Excessive straining		7	10	ns
Feeling of incomplete evacuation		16	22	ns
Use of antidiarrheals		6	10	ns
Use of laxatives		0	3	ns

CD – Crohn's disease; UC – ulcerative colitis; IBD – inflammatory bowel disease.

Defecatory maneuver

The defecatory maneuver was abnormal in 12 patients with CD, in 15 patients with UC and in 1 control (CD vs control, $p < 0.03$; UC vs control, $p < 0.01$).

Urgency and/or tenesmus

A total of 67% of patients with CD and 84% of the patients with UC reported urgency. It was present at least once a day in 25% of the patients with CD and in 50% of the patients with UC. The difference was statistically significant. Tenesmus was reported by more than 2/5 of patients in both groups. The period of time in which it is possible to defer defecation after the desire to evacuate, known as deferral time, was not longer than 5 min in 45% of CD patients and in 54% of UC patients. Urgency or tenesmus worsened everyday functioning in 55% of patients with CD and in 70% of patients with UC (Table 3).

Table 3. Urgency and tenesmus in patients with IBD

Characteristic	CD (n = 31)*	UC (n = 37)*	p-value
Urgency	21	31	ns
Urgency at least once a day	8	19	<0.04
Tenesmus	14	18	ns
Deferral time ≤5 min	14	20	ns
Worsened daily functioning because of urgency/tenesmus	17	22	ns

CD – Crohn's disease; UC – ulcerative colitis; IBD – inflammatory bowel disease; * data was not available in 2 patients with CD and 1 patient with UC.

Fecal incontinence

Fecal incontinence was present in 52% of patients diagnosed with CD and in 60% of patients diagnosed with UC. Ten patients in each group reported passive incontinence. Discharge of fecal matter in spite of efforts to retain

bowel contents – urge incontinence – affected almost 25% of the patients in the 2 study groups. In 6 patients from group I and 5 patients from group II symptoms of passive and urge incontinence were present. Five patients from group I and 8 patients from group II admitted experiencing leakage of a small amount of stool without their awareness or staining of undergarments following an otherwise normal evacuation, i.e., fecal seepage. In both groups, the discrimination between stool and gas was defective in more than 2/5 of patients, while 16% of them reported wearing pads because of incontinence (Table 4).

Table 4. Fecal incontinence in patients with IBD

Characteristic	CD (n = 33)*	UC (n = 38)*	p-value
Fecal incontinence	14	17	ns
Passive incontinence	10	10	ns
Urge incontinence	7	9	ns
Incontinence to gas	12	12	ns
Incontinence to liquid stool	13	19	ns
Incontinence to solid stool	3	4	ns
Defective discrimination between stool and gas	13	15	ns
Wearing pads	5	6	ns
Worsened daily functioning because of fecal incontinence	13	15	ns

CD – Crohn's disease; UC – ulcerative colitis; IBD – inflammatory bowel disease; * data was not available in 2 patients with CD and 1 patient with UC.

Table 4 differentiates patients with CD and UC depending on the type of fecal matter when incontinent. Grades I, II, and III, according to the Miller's Incontinence Score have the following significance: I – less often than once a month, II – from once a week to once a month, III – more than once a week.² Incontinence to gas was present in 39% of patients with CD and in 32% of patients with UC; incontinence to liquid stool was present in 45 and 51% of patients, respectively; and incontinence to solid stool was present in 10% and 11% of the patients, respectively (Table 5).

Fecal incontinence worsened everyday functioning of 42% of CD patients and 51% of UC patients (Table 4).

Discussion

Diarrhea is the most characteristic symptom of IBDs. In UC it is caused by rectal mucosal inflammation, but in CD its character strictly depends on the location of the disease. In Crohn's colitis, like in UC, especially when the rectum is inflamed, stools are frequent and scarce. As the inflammatory process and fibrosis of the rectal wall progresses, it becomes rigid and poorly extensible; diarrhea is the consequence of this decreased rectal compliance. In small bowel disease, stools are large in volume. Steatorrhea or chologenic

Table 5. Frequency of fecal incontinence based on the type of fecal matter in patients with IBD (according to Miller's score for fecal incontinence)²

Characteristic		CD (n = 33)	UC (n = 38)	p-value
Gas incontinence	I	4	3	ns
	II	3	6	
	III	5	3	
	pooled	12	12	
Liquid stool incontinence	I	5	6	ns
	II	2	7	
	III	7	6	
	pooled	14	19	
Solid stool incontinence	I	1	2	ns
	II	0	1	
	III	2	1	
	pooled	3	4	
n/a*		2	1	–

CD – Crohn's disease; UC – ulcerative colitis; IBD – inflammatory bowel disease; * data not available.

diarrhea are commonly observed. In our study, 40% of patients with CD and UC had more than 3 stools a day in the week preceding hospitalization. In more than 60% of patients, they were loose or watery.

However, 25% of patients with IBD reported excessive straining in order to defecate and more than 50% reported a feeling of incomplete evacuation. Constipation, defined as passing hard or lumpy stools, was present in 3 patients with CD and in 5 patients with UC. Three patients with UC used laxatives. Ulcerative colitis is commonly associated with symptoms such as diarrhea, rectal bleeding and abdominal pain. Rao et al. assessed the prevalence of bowel and anorectal symptoms in 96 patients with active, quiescent, as well as distal and total UC. Urgency was present in 85% of cases, a feeling of incomplete evacuation in 78% and tenesmus in 63% of patients with active UC. These symptoms were all significantly less common in patients with quiescent colitis. Their prevalence was similar among patients with distal and total colitis, which may indicate that they are related to an inflamed distal colon and rectum. A total of 27% of patients with active UC voided hard stools, which was a significantly higher proportion compared to patients with quiescent colitis.³ When asked about the frequency of bowel movements, patients often attribute frequent passage of blood and mucous to diarrhea; this fact may lead to constipation being overlooked in many cases which otherwise would have been diagnosed if stool consistency would had been taken into consideration as a criterion.

Rao and Read also analyzed the colonic transit of a test meal and stool weight and frequency in 62 patients with UC as well as in 20 healthy volunteers. Whole gut transit time was unchanged in UC patients in comparison with the control group. The authors suggest that diarrhea in UC is associated with rectosigmoid inflammation rather

than rapid transit, and they recommend caution when prescribing such patients antidiarrheals, which could further impede proximal colonic transit.⁴

Constipation may be a dominant symptom of ulcerative proctitis, especially in elderly patients. Crispino et al. investigated the functional and morphologic features of the anorectal region in 11 patients with inactive UC and constipation, and in 10 patients with functional constipation. Patients with ulcerative proctitis had lower rectal compliance, prolonged left colon transit and lower lateral rectal diameter than patients with functional constipation. This, according to the authors, suggests that constipation in ulcerative proctitis may be correlated with rectal fibrosis.⁵

Symptoms such as abdominal pain, diarrhea, constipation, pain relief with bowel action, urgency, straining in order to defecate, a feeling of incomplete evacuation, and flatulence are characteristic of irritable bowel syndrome (IBS). Isgar et al., using the Manning criteria, demonstrated that 33% of patients with UC fulfilled the diagnostic criteria of IBS.⁶ Patients with UC, both active and in remission, had increased low-amplitude colonic propulsive activity with respect to controls, while there was no difference in the frequency of propagated contractions between active colitis patients and patients with IBS and diarrhea.^{7,8} This observation may at least partially explain the presence of IBS symptoms in UC patients. In the study of Simren et al., IBS symptoms were present in 33% of patients with UC and in 57% of patients with CD. Their presence was associated with increased levels of anxiety and depression and they worsened the patients' general well-being.⁹

The defecatory maneuver was abnormal in 1/3 of patients with CD and UC, which constituted a significantly higher percentage compared to the control group. Previously, only Loening-Baucke et al. assessed this parameter in IBD patients. The results of a balloon defecation test were similar in patients with active and inactive UC and in healthy subjects.¹⁰ The lack of anal relaxation during straining in a large number of UC patients may explain the excessive straining in order to defecate and the feeling of incomplete evacuation. It should be noted that this examination is very subjective and dependent on many factors, e.g., the degree of privacy and the fact that impaired anal relaxation may be seen in more than 20% of healthy subjects.¹¹

The frequency of urgency in patients with UC in our study was similar to the frequency of this symptom in the above-cited study by Rao et al., whereas tenesmus was present slightly more often (49% vs 63%).³ Urgency at least once a day occurred twice as often in patients with UC than in patients with CD. The deferral time in a study by Mueller et al. was not longer than 5 min in 50% of CD patients without active disease in the rectum as determined by endoscopy.¹²

Urgency and tenesmus are particularly unpleasant symptoms which may persist in patients with IBD despite optimal medical treatment and may be an indication for surgery. Buchmann et al., who compared 20 patients with CD who

were suffering from urgency with 19 patients who did not report its presence, did not find any difference in anal resting and squeeze pressures or anal response to passive rectal filling. The authors suggested the role of small and large intestine dysmotility in the pathogenesis of urgency in CD.¹³

Fecal incontinence was present in more than 50% of patients with CD and in approx. 60% of patients with UC. In the above-cited study by Rao et al., fecal incontinence was present in 18% of patients with distal active UC and in 31% of patients with total active UC.³ Fecal incontinence is an especially embarrassing medical condition and patients are reluctant to report it to a physician unless asked directly. In both studies, a questionnaire was used. Kangas et al., who studied anorectal function in 63 patients with CD, found 17% of patients to be partially incontinent and 5% of patients to be totally incontinent.¹⁴ Urge incontinence affected almost 25% of patients with CD and UC, which generally reflects the proportions observed in the literature.^{3,14}

Our data points out the scale of the problem of fecal incontinence in patients with IBD. In the study by Mueller et al., incontinence to gas, liquid stool and solid stool was diagnosed in 24%, 46% and 9% of patients with CD without endoscopic rectal changes, respectively.¹² In our study, proctitis was confirmed in 9 patients (27%) with CD.

Incontinence to gas mainly affected patients with CD, while incontinence to gas and liquid stool occurred more often in patients with UC. Discrimination between stool and gas was impaired in more than 40% of patients with both CD and UC, and 16% of them had to wear pads because of incontinence. In the study by Mueller et al., the ability to discriminate between stool and gas was defective in 24% of patients with CD. A total of 12% of these patients wore pads because of incontinence.¹²

Fecal incontinence worsened everyday functioning in 42% of patients with CD and in 51% of patients with UC. Fecal incontinence and its related concerns could represent the elements of the symptomatology of IBD which are most constricting in everyday life. In a study aiming to provide optimal nursing care, 5 young adults, who were asked what mattered most as they lived with IBD, pointed out embarrassment and concerns related to fecal incontinence, among other aspects.¹⁵ In UC patients, fear of fecal incontinence can be obsessive and can lead to compulsive evacuation-checking. This can be called bowel obsession syndrome (BOS) and is a type of obsessive-compulsive disorder. Porcelli and Leandro described a male patient with UC and marked symptoms of BOS who was successfully treated with antidepressants.¹⁶ Fear of fecal incontinence was the reason for sexual inactivity in 14% of women with CD in a study by Moody et al.¹⁷

Our data has clearly shown that fecal incontinence affects a large percentage of patients with both CD and UC, and constitutes an important element of the clinical picture which has a great impact. However, the main limitation of this study is its relatively small overall sample size.

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