Relationship between rectal sensitivity, symptoms intensity and quality of life in patients with irritable bowel syndrome.

Jean-Marc Sabaté, Michel Veyrac, François Mion, Laurent Siproudhis, Philippe Ducrotté, Franck Zerbib, Jean-Charles Grimaud, Michel Dapoigny, François Dyard, Benoit Coffin

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Sabaté Jean-Marc [1 2 *] **, Veyrac Michel** [3] **, Mion François** [4] **, Siproudhis Laurent** [5] **, Ducrotté Philippe** [6] **, Zerbib Franck** [7] **, Grimaud Jean-Charles** [8] **, Dapoigny Michel** [9] **, Dyard François** [10] **, Coffin Benoit** [1 2]

[1] *Service d'Hépato-Gastroentérologie Hôpital Louis Mourier, Colombes,FR*

[2] *Physiopathologie et Pharmacologie Clinique de la Douleur INSERM : U792, Université de Versailles-Saint Quentin en Yvelines, Hopital Ambroise Pare PARIS V 9, Avenue Charles de Gaulle 92100 BOULOGNE BILLANCOURT ,FR*

[3] *Fédération Médico-Chirurgicale des Maladies de l'Appareil Digestif CHU montpellier, Hôpital Saint-Eloi, FR*

[4] *Exploration Fonctionnelle Digestive CHU Lyon, Université Claude Bernard - Lyon I, FR*

[5] *Service des Maladies de l'Appareil Digestif CHU Rennes, Hôpital Pontchaillou, FR*

[6] *Département d'Hépato-Gastroentérologie et de Nutrition CHU Rouen, Hôpital Charles Nicolle, FR*

[7] *Service d'hépato-gastroentérologie CHU Bordeaux, FR*

[8] *Département d'Hépato-Gastroentérologie AP-HM, Hôpital nord, Marseille, FR*

[9] *Service d'Hépato-Gastroentérologie CHU Clermont-Ferrand, Hôtel-Dieu, FR*

[10] *Laboratoire Solvay Pharma Laboratoire Solvay Pharma, 42 rue Rouget de Lisles, 92151 Suresnes CEDEX,FR*

* Correspondence should be adressed to: Jean-Marc Sabaté <jean-marc.sabate@lmr.aphp.fr>

Abstract

Background

Relationships between pain threshold during rectal distension and both symptoms intensity and alteration in quality of life (QoL) in IBS patients have been poorly evaluated.

Aim

To evaluate relationships between rectal sensitivity, IBS symptom intensity and QoL in a multicentre prospective study.

Methods

Rectal threshold for moderate pain was measured during rectal distension in IBS patients (Rome II) while IBS symptoms intensity was assessed by a validated questionnaire and QoL by the FDDQL questionnaire.

Results

68 patients (44.2 ± 12.7 yrs, 48 women) were included. The mean rectal distending volume for moderate pain was 127 ± 35 mL while 45 patients (66 %) had rectal hypersensitivity (pain threshold < 140 mL). Rectal threshold was not significantly related to overall IBS intensity score (r = −0.66, P = 0.62) or to its different components, neither to FDDQL score (r = 0.30, P = 0.14). Among FDDQL domains, only anxiety (r = 0.30, P = 0.01) and coping (r = 0.31, P = 0.009) were significantly related with pain threshold.

Conclusion

In this study, 2/3 of IBS patients exhibited rectal hypersensitivity. No significant correlation was found between rectal threshold and either symptom intensity or alteration in QoL.

MESH Keywords Adolescent ; Adult ; Aged ; Female ; Humans ; Irritable Bowel Syndrome ; complications ; physiopathology ; Male ; Middle Aged ; Muscle Contraction ; physiology ; Pain Measurement ; Pain Threshold ; physiology ; Prognosis ; Prospective Studies ; Quality of Life ; psychology ; Questionnaires ; Rectum ; physiopathology

Author Keywords Irritable Bowel syndrome, rectal sensitivity, quality of life

INTRODUCTION

Irritable bowel syndrome (IBS) is a common functional bowel disorder characterized by abdominal pain or discomfort associated with altered bowel habits and/or abdominal bloating and/or defecation disorders.1 The pathophysiology of IBS is probably multifactorial, associating visceral hypersensitivity, micro-inflammation and psychosocial factors.2 It has been suggested that rectal hypersensitivity, i.e. the lower threshold for pain or discomfort in response to distension, could be a biological marker of IBS.3 If the evidence of rectal hypersensitivity in IBS patients has been extensively reported, the relationship between this hypersensitivity and the intensity of abdominal

symptoms has been poorly investigated. Recent data have suggested that a significant relationship between rectal hypersensitivity and the severity of IBS symptoms could exist 4–8 while others failed to demonstrate such a correlation.9.10.

IBS, as a chronic condition, has a significant negative impact on quality of life (QoL) which is at least equivalent to that demonstrated in other chronic gastrointestinal disorders such as gastro-oesophageal reflux disease or in non-digestive diseases, such as depression or diabetes mellitus.11 QoL alterations have been correlated with IBS symptom intensity.12 However, the relationships between pain threshold determined during rectal distension and an alteration in QoL in IBS patients has been poorly evaluated.

The primary objectives of this multicentre prospective study were to search for a relationship between the rectal threshold to distension and IBS symptom intensity defined by the irritable bowel severity scoring system.13 The secondary objectives were to look for a correlation between rectal threshold to distension and alterations in QoL measured by the Functional Digestive Disorder Quality of Life Questionnaire (FDDQL)14 and/or the different items of the questionnaires of IBS intensity and of the FDDQL.

PATIENTS AND METHODS

Patients

Following approval from the Saint Germain en Laye Ethics Committee, the study was conducted from June 2003 to December 2004 in IBS patients, aged 18 to 65 years, who provided written informed consent in eight French academic hospitals. Patients could be included if they fulfilled Rome-II IBS criteria.1 Specifically, they had to experience abdominal pain/discomfort with two of the following characteristics for at least 12 weeks (not necessarily consecutive) during the previous 12 months: 1) relief with defecation; 2) onset associated with a change in stool frequency; 3) onset associated with a change in stool form. Each patient underwent a complete clinical evaluation to exclude organic disease and only patients with a normal total colonoscopy within the previous 5 years could be included. Patients were excluded if they had undergone abdominal surgery other than appendectomy or hernia repair. Analgesics, antispasmodics, laxatives and antidiarrhoeal agents were stopped at least 7 days before the experimental protocol.

Questionnaires

IBS severity scoring system

Each patient was asked to complete the irritable bowel syndrome severity scoring system initially developed and validated by Francis et al.13 of which the French version has been previously validated.12 This self-administered questionnaire is composed of: 1) two items concerning the presence of abdominal pain and bloating (response yes or no); 2) four visual analogue scales measuring intensity of pain, bloating, relief following defecation, and impact of symptoms on general quality of life; 3) an item on the number of days of suffering during the preceding 10 days. This questionnaire produces a quantitative score ranging from 0 to 500 used to determine the severity of symptoms with a score < 75 defined patients in remission; between 75 and 175 mild IBS; between 176 and 300 moderate IBS; and > 301 severe IBS.

Quality of life questionnaire

QoL was measured by using the previously validated French version of the FDDQL questionnaire.14 It is a 43 item self-administered questionnaire that provides a profile with eight dimensions (stress scale, daily activities, coping with disease, anxiety, alimentation, sleep, discomfort, control) as well as a global score which can vary from 0 (poor QoL) to 100 (good QoL).

Rectal distension and pain threshold

Rectal distensions were performed with a 5 cm latex balloon (maximal volume 300 mL, Marquat, 94470 Boissy Saint Leger, France). None of the patients had previous rectal sensory testing. A small water enema of less than 50 mL was performed before rectal testing in patients with presence of stool in the rectum. The balloon was lubricated and inserted into the rectum. The distal attachment site of the balloon was 4 cm from the anal verge. The proximal opening of the tube was linked to a 100 mL syringe used to inflate the balloon with air. Each rectal distension was performed by slowly injecting air and lasted from 30 to 45 seconds from zero millilitres to the distending volume and deflated. A 2-min rest period was observed between each distension. Distensions were performed by 10 mL-stepwise increments from 0 mL to 60 ml and thereafter by 20 mL-stepwise increments. At the end of each distension the patient was asked to determine a pain score on a 5 levels scale with 0 represented no pain, 1 a moderate but discontinuous pain, 2 a moderate but continuous pain, 3 an intense but tolerable pain and 4 an intolerable intense pain. If the level 4 was reported during the distension, the balloon was immediately deflated. The moderate pain threshold (level 2) was first determined and then we started tracking around this volume with 5 random distensions above or under the volume according to reported sensations using a randomised tracking paradigm.15.16 At the end of the distending protocol, the mean volume inducing moderate pain was calculated and patients were classified into two groups: IBS with rectal hypersensitivity if the mean volume was ≤ 140 mL, IBS with normal rectal sensitivity if the mean volume was > 140 mL. The 140 mL threshold was previously defined in a group of healthy subjects and represents the volume threshold to identify rectal hypersensitivity during rectal manometry with the latex balloon.

Statistical analysis

Results are expressed as mean ± SE. First, the assessment of severity was determined using the irritable bowel syndrome severity scoring system and the global score of QoL was calculated and for each dimension measured by the FDDQL questionnaire. The mean volume of distension inducing moderate pain threshold was also calculated. Relationships between the moderate pain threshold, IBS severity score and QoL was calculated by the Pearson or Spearman correlation test. The severity score and global QoL, was compared for each IBS subgroups according to rectal sensitivity (Mann-Whitney test). Then the relationships between the moderate pain threshold and the 5 items of the severity score and the 8 dimensions of QoL was determined by using Pearson correlation tests and compared in different IBS subgroups with or without rectal hypersensitivity (t-test). Multivariate analysis has been performed (factorial and logistic regression) to identify specific profiles associated with visceral hypersensitivity. A P value < 0.05 was considered to be significant.

RESULTS

Patients

Sixty eight patients [mean age: 44.2 ± 12.7 yrs, 45 women (66.2%)] in whom the main motive of consultation was IBS symptoms and who fulfilled Rome II criteria were included in the study. The mean duration of symptoms was 13.8 ± 12.6 years with a mean age of first symptoms being 30.4 ±12.6 yrs (1–5 year-duration: 26.4 %; 5–10 year-duration: 27.9 %; > 10 year-duration: 45,6 %). The mean number of days with abdominal pain during the last 30 days was 21.2 ± 8.8 days with 33.8 % of patients having constant abdominal pain. According to Rome II criteria, 13 patients (19.1%) had constipation predominant IBS (C-IBS), 28 (41,2 %) had diarrhoea predominant IBS (D-IBS) while 27 (39,7 %) could not be classified. According to Rome II criteria for dyspepsia,17 42 patients (61,2 %) had also mild dyspeptic symptoms and 30 (44,1 %) mild GERD symptoms. Migraine was present in 28 patients (41.2 %), mild symptoms of fibromyalgia in 33 (48.5 %), disturbed sleep in 41 (60,3 %) and premenstrual syndrome in 10 women. Only 20 patients (29,4 %) had no extra-intestinal symptoms.

Rectal distension

The mean rectal volume for moderate pain threshold (level 2) was 127.1 ± 64.6 mL and was not significantly different from the moderate pain threshold determined after 5 random distensions using the tracking method which was 133.7 ± 66.6 mL. Forty five patients (66,2 %) had rectal hypersensitivity (mean moderate pain threshold < 140 mL). The percentage of patients with rectal hypersensitivity was no significantly different according to bowel habit (62 % of C-IBS vs. 67% of D-IBS and unclassified IBS, P=0.94). The number of patients with rectal hypersensitivity was no significantly different according to centre, gender, disease duration, the presence of dyspeptic symptoms or GERD or the presence of extra-intestinal symptoms and fibromyalgia (results not shown).

IBS severity scoring and FDDQL

The mean severity score during the last 10 days was 306 ± 76 (range: 66–458). It was not significantly different in patients with hypersensitivity in comparison to those without (311.0 ± 84.2 vs 298.0 ± 60.3 respectively, P = 0.23) and according the presence or not of dyspeptic or GERD symptoms or extra-intestinal symptoms (results not shown). The mean QoL score on the last 15 days was 47.3 ± 16.4 (17.7–89.6) and there was a trend for lower QoL score in hypersensitive than in normosensitive patients (44.7 ± 15.8 vs 52.3 ± 16.7 respectively, P = 0.08). As shown on figure 1, each domains explored by the FDDQL were always higher in normosensitive patients than in hypersensitive patients, but differences were not significant.

Relationship between pain threshold, and severity score and FDDQL

The mean volume at the moderate pain threshold was not significantly related neither to overall IBS intensity (r = −0.66, P = 0.62, figure 2) nor to the FDDQL score (r = 0.30, P = 0.14, figure 3). Similarly, rectal pain threshold was not related neither to intensity of pain neither to the others components of IBS intensity score (Table 1). Results were similar when patients were classified as hypersensitive or normosensitive to rectal distension (results not shown). Among the 8 domains explored by the FDDQL (table 2), only anxiety (r = 0.30, P = 0.01, Figure 3) and coping (r = 0.31, P = 0.009, Figure 4) were significantly related to the mean volume at the moderate pain threshold.

Finally, a significant relationship could be evidenced between the severity score and the global score of the FDDQL (r = − 0,54; P < 0,0001).

Specific profiles associated with visceral hypersensitivity (Logistic regression)

Beyond subscores and global scores of IBS symptoms severity score and FDDQL score, only coping with disease (OR = 0.928, P = 0.011) was significantly associated with visceral hypersensitivity. There was a trend for anxiety (OR = 0.944, P = 0.0515).

DISCUSSION

This study aimed to explore the possible associations between IBS intensity and the presence of rectal hypersensitivity. Our data suggest that rectal hypersensitivity is frequent in IBS patients but that IBS intensity measured by a validated specific questionnaire could not distinguish hypersensitive patients from normosensitive ones. Similarly, we could not evidence a significant relationship between rectal sensitivity and the global score of quality of life but only with coping. We confirmed that intensity of symptoms and alteration in QoL were significantly correlated.

During the last 15 years, several studies have clearly demonstrated that rectal hypersensitivity was prevalent in IBS patients. Some authors suggested this could be considered as the biological marker of IBS which varied with symptom intensity.3 Another study has reported that a pharmacological intervention with an antidepressant, amitriptyline, induced a decrease in symptom intensity and an increase in sensory thresholds, while a psychological intervention did not modify rectal sensitivity whereas symptoms decreased.4 Although it could have a direct clinical consequence for patient's management, the question of a relationship between rectal sensitivity and IBS symptoms intensity remains poorly explored and only in single centre studies. Recently, Posserud et al could demonstrate that altered rectal perception was associated with GI symptom severity in general, and pain and bloating more specifically.8 Other studies reported relationships between visceral hypersensitivity and some, but not all, of the hallmark symptoms in IBS5–7.10.18 whereas the degree of basal hypersensitivity was not correlated to symptoms in another study4 and only to the presence of severe abdominal pain in a last one.9 The assessment of symptoms severity in IBS patients is still a matter of debate. Only few questionnaires like the symptoms severity scoring system, that we used, or the gastro-intestinal symptom rating scale-IBS8.9 have been validated in the literature. Most of these studies previous did not use such validated questionnaire and their main objective was to distinguish sensitivity between C-IBS and D-IBS patients.5–7.10 In the present study, rectal distensions were not performed by an electronic barostat but by a latex balloon slowly inflated by air with a syringe. This was a deliberated choice because we planned a pragmatic study that could be performed, in case of positive results, during daily clinical practice as it has been proposed to identify patients with defecation disorders.19 However, to decrease the potential bias related to the balloon choice and the technique of inflation, we used a tracking method with five randomised distensions above or below the threshold for moderate pain as it is recommended to avoid perceptual response bias.20. The frequency of two thirds of patient with abnormal pain threshold is in accordance with previous studies3.21 but higher than the 39% of patients with lowered thresholds in the recent Posserud's study.8 Using a wider definition based not only the rectal pain threshold but also perceived intensity of unpleasantness and abnormalities in somatovisceral referral areas, the UCLA group3 and Posserud et al8 found respectively a prevalence of 94% and 61% of IBS patient having altered rectal perception. Like Kuiken et al.,9 we did not find any difference in bowel habits between patients with and without rectal hypersensitivity. Concerning this last point, contradictory results have been published, rectal hypersensitivity being found more frequent in D-IBS patients by some authors6.10 but not by others.8.9 One explanation for our negative results could be that we explored IBS patients recruited in tertiary centre, with long-standing disease duration and associated comorbidities. These patients are known to have more severe IBS.22 In accordance with this hypothesis, logistic regression found that coping with disease was significantly correlated with rectal sensitivity.

The second objective of our study was to look for a correlation between rectal sensitivity and QoL using a validated questionnaire, the FDDQL.14 We did not find any significant relationship between pain threshold and the global score of FDDQL. We only found a correlation between pain threshold and two of the eight domains of QoL questionnaire, i.e anxiety and coping with disease; patients with more anxiety and bad coping strategies having lower moderate pain thresholds. In their study, Posserud et al.8 found that clinical anxiety was more frequent in patients with altered perception, but not in those with only lowered rectal pain thresholds. Others also demonstrated that illness-specific coping and GI symptom specific anxiety can influence perception of experimental pain stimulus and symptom reporting.23 Taken together with our results and with functional imaging studies data24 these associations could be an argument for a role of psychological processes (CNS implication) in perceptual rating.25

Finally, Drossman et al.18 in a study performed to identify factors influencing symptom severity in patients with painful functional bowel disorders, only found a trend for lower rectal sensation thresholds in patients with a severe disease but evidenced that such patients had a greater depression and psychological distress, poorer physical functioning and health-related quality of life, more maladaptive coping strategies. In a previous study12 conducted in a large cohort of IBS patients visiting gastroenterologists in a non-hospital setting we also found a correlation between severity of IBS symptoms and QoL evaluated by the GIQLI questionnaire. In the present study, we could confirm this association in a smaller cohort of IBS patients by using a more specific questionnaire, the FDDQL.

In conclusion, in this group of IBS patients consulting in tertiary academic centres, hypersensitivity to rectal distension has been evidenced among 2/3 of the patients, a proportion similar to those previously reported. No significant relationship could be evidenced between rectal threshold and symptom intensity or alteration in QoL, suggesting that a single symptomatic analysis cannot detect patients with rectal hypersensitivity. This strategy could be of importance in order to identify patients potentially responders to a treatment acting on visceral sensitivity, such as antidepressant agents, tegaserod or pregabaline.4.26.27 Therefore, the development and the validation of more specific questionnaires to measure IBS intensity, like that recently developed to identify patients with neuropathic pain,28 warrant further studies.

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Figure 1

Global and specific values of the FDDQL in the total IBS group, in the IBS hypersensitive group and in the IBS normosensitive group. Differences were not significant.

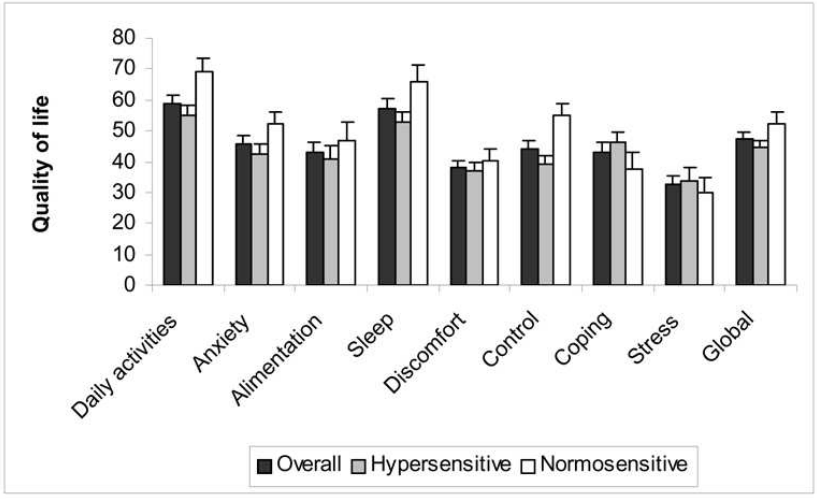

Figure 2

Relationship between Moderate pain threshold and the “coping with disease domain” of the FDDQL score. There was a significant correlation (r = 0.31, P = 0.009)

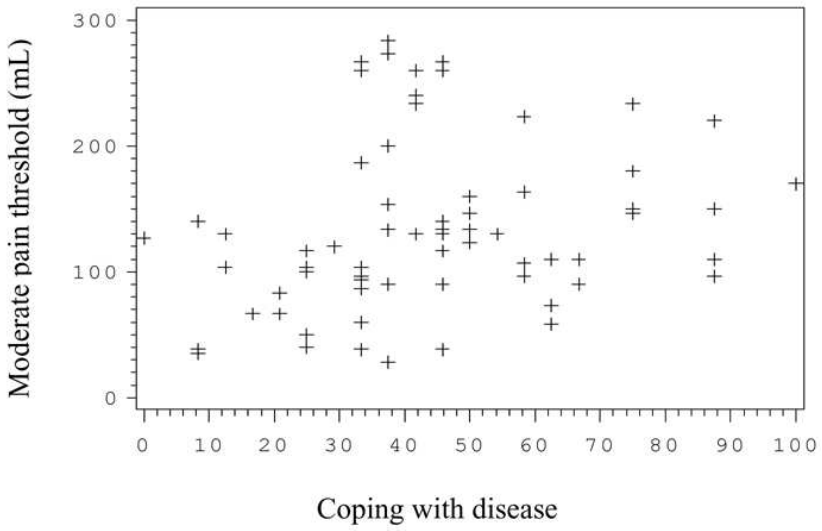

Table 1

Relationship between moderate pain threshold and the different items of the IBS severity scoring system.

Item of the IBS severity scoring	r	P
Intensity of pain	−0,08491	0,4912
Intensity of bloating	−0,11606	0,3460
Relief following defecation	0,04608	0,7090
Impact of symptoms on general quality of life	−0,03456	0,7796
Number of days of suffering during the preceding 10 days	0,16360	0,1825

Table 2

Relationship between moderate pain threshold and the 8 specific domains of FDDQL questionnaire.

Domains of the FDDQL scales	r	P
Daily activities	0.212	0.083
Anxiety	0.309	0.010
Diet	0.056	0.650
Sleep	0.171	0.164
Discomfort	0.068	0.581
Coping with disease	0.313	0.009
Control of disease	−0.190	0.121
Stress	−0.022	0.857

Score for each dimension of FDDQL ranged from 0 (poor quality of life) to 100 (good quality of life). For positive correlations (r>0), an increase in score is associated with an increase in threshold (volume, in mL) of moderate pain threshold (less sensitive).