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Alimentary Tract

IBS clinical management in Italy: The AIGO survey☆

Marco Soncini[a], Cristina Stasi[b,*], Paolo Usai Satta[c], Giuseppe Milazzo[d], Margherita Bianco[e], Gioacchino Leandro[e], Luigi Maria Montalbano[f], Nicola Muscatiello[g], Fabio Monica[h], Francesca Galeazzi[i], Massimo Bellini[j], on behalf of the AIGO[1]

[a] Digestive Physiopathology Unit, ASST Santi Paolo e Carlo, Milan, Italy
[b] Internal Medicine and Hepatology Unit, University Hospital of Florence, Florence, Italy
[c] Brotzu Hospital, Cagliari, Italy
[d] Vittorio Emanuele III Hospital, Salemi, Trapani, Italy
[e] National Institute of Gastroenterology "S. De Bellis" Research Hospital, Castellana Grotte , BA, Italy
[f] Villa Sofia-Cervello Riuniti Hospitals, Palermo, Italy
[g] Riuniti Hospitals of Foggia, Foggia, Italy
[h] Cattinara Hospital, Trieste, Italy
[i] University Hospital of Padua, Padua, Italy
[j] Gastroenterology Unit, Department of Translational Research and New Technologies in Medicine and Surgery, University of Pisa, Pisa, Italy

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ABSTRACT

Background: Irritable bowel syndrome (IBS) is the most frequent functional gastrointestinal disorder, both in primary and secondary care.
Aims: (1) To describe diagnostic tools and treatments suggested to IBS patients by Italian gastroenterologists; (2) To evaluate patients' quality of life and psychological involvement and the relationship of these factors with symptom severity.
Methods: Twenty-six gastroenterologists recorded the demographic and clinical data of 677 IBS patients. Diagnostic and treatment measures taken in the previous year and those suggested by gastroenterologists were analysed.
Results: IBS with constipation was found in 43.4%, with diarrhoea in 21.6%, mixed-IBS in 35.0%. Routine blood tests, ultrasonography, colonoscopy, barium enema and CT were more frequently requested in the previous year than by the gastroenterologists ($p < 0.001$). Colonoscopy (11%), and ultrasonography (20.4%) were also suggested by the gastroenterologists in a non-negligible number of patients. Abdominal pain and distension, bowel dissatisfaction, anxiety and depression were more severe in females than in males. Quality of life decreased with increasing IBS-symptom severity.
Conclusions: IBS diagnosis is still largely based on exclusion criteria even if gastroenterologists try to improve diagnostic appropriateness. However, therapy remains symptom-based also in the gastroenterological setting even if gastroenterologists use a wide variety of approaches, including innovative therapies such as linaclotide and psychotherapy.

1. Introduction

Irritable bowel syndrome (IBS) is quite frequent in the general population, ranging from 5% to 20% [1]. It represents the functional gastrointestinal (GI) disorder most frequently encountered in primary and secondary care [2,3] and it is characterized by abdominal pain and changes in bowel habits (constipation and/or diarrhoea) [4]. It is often associated with other functional digestive and non-digestive disorders [5–7].

IBS has a multifactorial pathophysiology involving the central and peripheral pathways interplaying in various ways. The communication between brain and gut, the so called "brain-gut axis", is made possible through the autonomic nervous system and the enteric nervous system *via* neuroendocrine mediators. Signals received from the GI tract affect the brain which, in turn, can affect the motility, secretion and immune functions of the digestive tract.

☆ Italian Association of Hospital Gastroenterologists and Endoscopists.
* Corresponding author.
E-mail address: cristina.stasi@gmail.com (C. Stasi).
[1] The coauthors are listed in Appendix A.

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Thus, a disruption of the "brain-gut axis" determines changes in digestive motility and secretion, and causes visceral hypersensitivity [8,9]. In addition, genetic factors, infections and alterations of the intestinal microbiota, inflammation and food intolerance and/or hypersensitivity could play a role by altering the integrity of the intestinal barrier and intestinal permeability [10,11].

The cross-cultural aspects and psychological factors in IBS pathophysiology are well recognized [12–14]. The psychological distress and environmental factors probably affect both the clinical expression and symptom severity and thus play a co-causative role in the onset, clinical expression and evolution of this syndrome [9,13,14].

IBS can have a serious impact on patients' quality of life and the direct and indirect costs of this syndrome are high as the patient may undergo expensive tests and treatments [5,7,15–18,19].

The first line therapeutic approach is directed towards education, reassurance and lifestyle modification. In case of an unsatisfactory response, an appropriate pharmacologic therapy can be suggested on the basis of digestive symptoms and/or psychological disturbances [7].

Many different drugs have been suggested for IBS treatment, but their real benefits are very debatable [14]. Based on multifaceted pathophysiology, it is unlikely that drugs acting on a single receptor and/or a unique pathophysiologic mechanism are able to provide any substantial therapeutic gain with respect to placebo, for which the response rate, in this disease, is approximately 40% [20].

Indeed, we are still far from having discovered the "magic bullet" capable of treating all symptoms presented by the single patient. Although many papers have been published in recent years, up to now, many fundamental questions remain unanswered about IBS pathophysiology, diagnosis and therapy [18].

The aims of this study were: (1) To describe the diagnostic tools used and the treatments suggested by the Italian gastroenterologists for their IBS patients; (2) To evaluate the quality of life and the psychological involvement in an Italian cohort of IBS patients and their relationship with IBS symptom severity.

2. Materials and methods

2.1. Study population

On behalf of the Italian Association of Hospital Gastroenterologists and Endoscopists (AIGO), in 26 Italian gastroenterological units (9 in the north, 9 in the centre and 8 in the south), gastroenterologists recorded clinical and demographic data of all patients referred for IBS, diagnosed according to the Rome III criteria, from 1st July 2014 to 31st December 2014 [21].

The centres involved in the present survey were asked to enrol from a minimum of 20 to a maximum of 40 IBS patients in a 6-month period. This design was conceived to avoid the most attractive GI centres, seeing many patients, and probably located in bigger cities, enrolling too many patients and, furthermore, to allow smaller centres (generally located in smaller towns) to have time to involve a sufficient number of their patients in the study. This study design makes sure that the target population is representative as possible of the multifaceted Italian reality.

Gastroenterologists were also asked to record whether the patients were clinically assessed for the first time for IBS or if they were in a follow-up stage. The amount of self reported working days lost, diagnostic tests and GP examinations in the previous year, therapies currently being undergone, diagnostic tests and therapies **requested** by the gastroenterologists at the end of the examination were also recorded. In the previous year diagnostic tests and therapies had been suggested by a GP or by a gastroenterologist or had been autonomously chosen by patients themselves.

The patients were prospectively and enrolled according to the following inclusion criteria:

- Patients aged over 18 years;
- Absence of known or suspected severe organic and/or psychiatric disease and/or any conditions potentially interfering with a correct compilation of the questionnaires;
- Able to give informed consent.

Exclusion criteria are as follows:

- Patients with severe concurrent medical disease or previous major abdominal surgery, presence of significant alterations to routine blood tests, the presence of organic changes during endoscopic examination of the colon;
- Patients who had a severe psychiatric disorder;
- Pregnancy or lactation.

Patients were required to fill in anonymously the following questionnaires: Hospital Anxiety and Depression Scale (HADS) [22] and the Short Form (SF12) [23]. HADS is a self-reported questionnaire used to evaluate state of anxiety and depression [22]. By means of 14 items this scale explores several symptoms such as anxiety, tension, autonomic and somatic symptoms and behaviour during interview. Each symptom category is evaluated by a score ranging from 0 (absent) to 4 (severe) with a possible total score ranging from 0 to 56.

The SF 12 is a 12-item, self-reported, widely used questionnaire validated to measure the patient's quality of life [23]. The questionnaire investigates two synthetic indexes, the Physical Component Summary (PCS) for physical state and Mental Component Summary (MCS) for mental state.

IBS symptom severity was evaluated using the IBS-SSS questionnaire, which measures 5 separate items: (a) presence and severity of abdominal pain or discomfort; (b) frequency of abdominal pain (c) presence and severity of abdominal distension; (d) degree of satisfaction with defecatory function; (e) degree of interference of IBS symptoms with daily lifestyle. For each of the 5 items, the questions generate a score ranging from 0 to 100. The global score of IBS-SSS, derived by summing these 5 items, ranges from 0 to 500, so enabling a practitioner to classify the syndrome as mild ($\geq$75 < 175), moderate ($\geq$175 < 300) or severe ($\geq$300). A score <75 is considered as normal [24].

The study protocol was approved by the Ethical Committee of Sacco Hospital (study number 30/ST/2014 approved on 06 June 2014.) and was carried out in accordance with the Helsinki Declaration (Sixth Revision, Seoul 2008). A signed informed consent was obtained from each participant.

2.2. Statistical analysis

Statistical analysis was performed using SPSS (version 21.0; SPSS IBM) and was reported as frequencies and mean $\pm$ standard deviation. Categorical variables were assessed using the chi-square test or test of proportions, as appropriate. Comparisons between quantitative variables were assessed by the Mann–Whitney and Kruskal–Wallis tests, due to their non-normal distribution. A non-parametric test for trend was used as appropriate. Adjusted residual analysis was performed when statistical differences were observed. A p value of 0.05 was considered statistically significant.

3. Results

Six hundred and seventy-seven IBS patients (493 females, 72.8% and 184 males, 27.2%), mean age: 43.1 $\pm$ 15.3 years (F

Table 1
IBS-SSS score and the single items according to gender.

		Sex		
	N = 677	Female (N = 493)	Male (N = 184)	p
Abdominal pain severity (0–100) (M ± SD)	47.0 ± 23.3	49.2 ± 23.3	41.0 ± 22.2	<0.001[a]
Abdominal pain duration (0–100) (M ± SD)	52.5 ± 29.8	53.8 ± 30.0	48.9 ± 28.9	0.06[a]
Abdominal distension severity (0–100) (M ± SD)	52.8 ± 24.5	55.3 ± 24.5	46.0 ± 23.1	<0.001[a]
Bowel habit satisfaction (0–100) (M ± SD)	71.3 ± 22.7	72.6 ± 22.4	67.9 ± 23.3	0.03[a]
IBS-related quality of life (0–100) (M ± SD)	47.7 ± 25.7	48.1 ± 25.7	46.4 ± 25.7	0.41[a]
IBS-SSS total score	271.2 ± 84.8	279.1 ± 85.1	250.2 ± 80.4	<0.001[a]
IBS-SSS (%)	N(%)	N(%)	N(%)	
75–175	87 (12.8)	53 (10.7)	34 (18.5)	
175–300	330 (48.7)	229 (46.5)	101 (54.9)	
>300	260 (38.5)	211 (42.8)	49 (26.6)	

IBS-SSS, IBS symptom severity score.
[a] Mann–Whitney test.

Table 2
Diagnostic tests performed in the previous year and those suggested by gastroenterologists.

	Performed in the previous year N pts (%)	Suggested by gastroenterologists N pts (%)	p[a]
Routine blood test	441 (65.1)	148 (21.9)	<0.001
Coeliac serology	102(14.9)	309 (45.6)	<0.001
Stool culture, test for ova and parasites	232 (34.0)	156 (22.8)	<0.001
FBT	170 (25.1)	115(1.7)	<0.001
Ultrasonography	304 (44.9)	138 (20.4)	<0.001
CT	32 (4.7)	1 (0.1)	<0.001
MRI	8 (1.2)	3 (0.4)	ns
Barium enema	51 (7.5)	6 (0.9)	<0.001
Rectosigmoidoscopy	14 (2.1)	6 (0.9)	ns
Colonoscopy	286 (42.2)	74 (10.9)	<0.001
Colon CT	12 (1.8)	6 (0.9)	ns
Lactose breath test	127 (18.8)	99 (14.6)	<0.05
Other	91 (13.3)	176 (25.8)	<0.001

FBT, fecal blood test; CT, computed tomography; MRI, magnetic resonance imaging.
[a] Test of proportions.

42.7 ± 15.3 years; M 44.0 ± 15.4 years) were enrolled. According to the Rome III criteria, the patients were classified as constipated IBS (IBS-C) (N = 294, 43.4%), diarrheic IBS (IBS-D) (N = 146, 21.6%) and mixed IBS (IBS-M) (N = 237, 35.0%). Among females, IBS-C were 226 (45.8%), IBS-D 102 (20.7%), IBS-M 165 (33.5%). Among males IBS-C were 68 (37.0%), IBS-D were 44 (23.9%), IBS-M were 72 (39.1%). No significant differences were found between males and females regarding the clinical presentation of IBS.

Out of 677 patients, 346 (51.1%; 260 F, 86 M) had a first diagnosis of IBS during their gastroenterological visit. They were significantly younger than patients with a previous diagnosis, (40.2 ± 14.9 *vs* 46.1 ± 15.1 years; p < 0.001).

The mean number of GP examinations in the previous year was 3.2 ± 4.5 (F 3.3 ± 4.9; M 2.9 ± 3.4;ns) (first diagnosis 3.2 ± 5.5; previous diagnosis 3.2 ± 3.3; ns) (IBS-C 2.9 ± 3.4; IBS-D 3.8 ± 6.9; IBS-M 3.2 ± 3.9; p < 0.05).

The working days lost in the previous year were 3.4 ± 8.2 (F 3.5 ± 9.0; M 3.0 ± 5.3; ns) (first diagnosis 3.3 ± 8.4; previous diagnosis 3.4 ± 8.0; ns) (IBS-C 3.6 ± 8.2; IBS-D 4.0 ± 9.7; IBS-M 2.8 ± 7.3; ns).

Table 1 are reported the IBS-SSS mean values (12.8% had a mild IBS, 48.7% a moderate IBS and 38.5% a severe IBS). Each item was compared for IBS-C, IBS-D and IBS-M. Bowel satisfaction was significantly lower in patients with IBS-C, whereas abdominal pain severity was more related to IBS-C and IBS-D. Pain severity, abdominal distension, bowel dissatisfaction were more severe in females than in males with a higher percentage of males (51.1%) complaining of a mild IBS and a higher percentage of females complaining of a moderate one. Younger patients showed more severe symptoms than older ones (p = 0.05).

3.1. Exams performed in the previous year and those suggested by the gastroenterologists

In the previous year some diagnostic tests had been **requested** in 578/677 (85.4%) patients. Table 2 shows the tests performed in the previous year and those suggested by the gastroenterologists after their examination. Routine blood tests (blood cell count, liver and renal function tests, electrolytes, glycemia and inflammatory markers), abdominal ultrasonography, colonoscopy, barium enema and CT had been more frequently **requested** in the previous year than by the gastroenterologists (p < 0,001). On the contrary, serology for celiac disease (p < 0.001) and lactose breath test (p < 0.05) were more frequently suggested by the gastroenterologists than in the previous year. No significant differences were found regarding stool tests, Colon CT, abdominal MRI and rectosigmoidoscopy. No sex difference was found, with the exception of colonoscopy, which was more frequently performed in females (p = 0.01) in the year before the gastroenterologist exam. In the previous year routine blood tests, stool tests, abdominal ultrasonography and colonoscopy were more frequently performed in patients with a first diagnosis than in patients with a known IBS. After the gastroenterological exam, only serology for celiac disease was more frequently **requested** to patients with a new diagnosis, whereas the anorectal manometry was **requested** to patients with known IBS.

Diagnostic tests suggested by the gastroenterologists in the different subgroups (IBS-C, IBS-D, IBS-M are shown in Table 3.

Routine blood tests (p < 0.05), serology for coeliac disease (p < 0.001), lactose breath test (p < 0.05), stool culture and test for ova and parasites (p < 0.001) were more frequently suggested in IBS-D than in the IBS-C and IBS-M subgroups. Anorectal manome-

Table 3
Diagnostic tests suggested by gastroenterologists according to the different IBS clinical presentations.

	IBS			p[a]
	IBS-C (N = 294)	IBS-D (N = 146)	IBS-M (N = 237)	
Routine blood tests	49⁻ (16.7)	41⁺ (28.1)	58 (24.5)	0.01
Coeliac serology	96⁻ (32.7)	90⁺ (61.6)	123⁺ (51.9)	<0.001
Stool culture, test for ova and parasites	39⁻ (13.3)	54⁺ (37)	63 (26.6)	<0.001
FBT	50 (17.0)	26 (17.8)	39 (16.5)	ns
Ultrasonography	51 (17.3)	30 (20.5)	57 (24.1)	ns
CT	0	0	1 (0.4)	ns
MRI	1 (0.3)	1 (0.7)	1 (0.4)	ns
Barium enema	5 (1.7)	0	1 (0.4)	ns
Rectosigmoidoscopy	3 (1.0)	2 (1.4)	1 (0.4)	ns
Colonoscopy	27 (9.2)	20 (13.7)	27 (11.4)	ns
Colon CT	2 (0.7)	1 (0.7)	3 (1.3)	ns
Lactose breath test	31⁻ (10.5)	30⁺ (20.5)	38 (16.0)	<0.05
Anorectal manometry	46⁺ (15.6)	4⁻ (2.7)	11⁻ (4.6)	<0.001
Other	72 (24.5%)	42 (28.8%)	61 (25.7%)	ns

⁺/⁻ Observed frequencies greater (+) than or less (−) than chance (adjusted residual analysis).
FBT, fecal blood test; CT, computed tomography; MRI, magnetic resonance imaging.
[a] Chi-square test.

Table 4
Therapies followed at the moment of the gastroenterological examination and those suggested by gastroenterologists.

Terapie	Currently taken N pts (%)	Suggested by the gastroenterologist N pts (%)	p
None	238 (35.2)	39 (5.8)	<0.001
Life style and dietary suggestions	213 (31.5)	479 (70.8)	<0.001
Probiotics	120 (17.7)	340 (50.2)	<0.001
Fiber supplements	108 (16.0)	110 (16.2)	ns
Antispasmodics	31 (4.6)	55 (8.1)	<0.05
Stimulant laxatives	51 (7.5)	5 (0.7)	<0.001
Macrogol	48 (7.1)	183 (27.0)	<0.001
Lactulose/lactitole	24 (3.5)	10 (1.5)	<0.05
Saline laxatives	12 (1.8)	5 (0.7)	ns
Enemas/suppositories/micro-enemas	60 (8.9)	15 (2.2)	<0.001
Prucalopride	7 (1.0)	9 (1.3)	ns
Linaclotide	1 (0.1)	31 (4.6)	<0.001
Rifaximine	18 (2.7)	31 (4.6)	ns
Mesalamine	1 (0.1)	18 (2.7)	<0.001
Herbal remedies	51 (7.5)	19 (2.8)	<0.001
Psychotherapy	10 (1.5)	92 (13.6)	<0.001
Antidepressant drugs (TCA/SSRI)	4 (0.6))	1 (0.1)	ns
Loperamide	32 (4.7)	25 (3.7)	ns
Other	35 (5.2)	82 (12.1)	<0.05

*Test of proportions.
TCA, tricyclic; SSRI, selective serotonin reuptake inhibitor.

try was more frequently **requested** to IBS-C patients than to other subgroups ($p < 0.001$).

3.2. Therapies undergone in the previous year and those prescribed by the gastroenterologists

In Table 4 the therapies before the gastroenterologist's exam and those prescribed by the gastroenterologists are shown. In 637/677 patients (94.1%) at least one treatment was given by the gastroenterologists. Lifestyle and dietary suggestions, probiotics, macrogol, linaclotide, antispasmodics, rifaximin, mesalamine and psychotherapy were more frequently prescribed by the gastroenterologists after their exam, whereas suppositories/micro-enemas, stimulant laxatives, lactulose/lactitole and herbal remedies were more frequently given in the previous year ($p < 0.001$ in all comparisons). No difference was reported regarding fibre supplements, saline laxatives and prucalopride. No gender difference was found for all therapies. Among therapies already followed by the patients before the gastroenterologist's exam, life style recommendations, probiotics, fibers, laxatives, suppositories/microenemas and prucalopride were more frequently used by the patients with a known diagnosis of IBS. After the gastroenterologist's exam only prucalopride and psychotherapy were more frequently suggested in known IBS than in the first diagnosed patients.

Therapies suggested by gastroenterologists in the different subgroups (IBS-C, IBS-D, IBS-M are shown in Table 5. Probiotics ($p < 0.01$) were prescribed more frequently to IBS-D than to IBS-C and IBS-M, whereas fibre supplements ($p < 0.001$), macrogol ($p < 0.001$), prucalopride ($p < 0.05$) and microenemas/suppositories/enemas ($p < 0.05$) were more frequently prescribed to IBS-C than to other subgroups.

3.3. Quality of life and psychological disorders

In Table 6 mean values of SF 12 and HADS scores, respectively, were reported according to gender and IBS symptom severity, respectively. HADS as well as the request for diagnostic tests and the therapy prescription increased with the severity of symptoms. Moreover, both anxiety and depression levels were higher in females than in males.

Also the quality of life measured by means of SF 12, both Physical and Mental components, decreased with increase in IBS-SSS, whereas only the mental component of SF 12 was lower in females

Table 5
Therapies suggested by gastroenterologists in the different IBS subgroups.

	IBS IBS-C (N = 294)	IBS-D (N = 146)	IBS-M (N = 237)	p
None	16 (5.4)	6 (4.1)	17 (7.2)	ns
Life style and dietary suggestions	210 (71.4)	107 (73.3)	162 (68.4)	ns
Probiotics	125⁻ (42.5)	86⁺ (58.9)	129 (54.4)	<0.01
Fiber supplements	69⁺ (23.5)	9⁻ (6.2)	32 (13.5)	<0.001
Antispasmodics	13⁻ (4.4)	15 (10.3)	27⁺ (11.4)	<0.01
Stimulant laxatives	4 (1.4)	1 (0.7)	0	ns
Macrogol	146⁺ (49.7)	6⁻ (4.1)	31⁻ (13.1)	<0.001
Lactulose/lactitole	7 (2.4)	1 (0.7)	2 (0.8)	ns
Saline laxatives	2 (0.7)	1 (0.7)	2 (0.8)	ns
Enemas/suppositories/micro-enemas	12⁺ (4.1)	1 (0.7)	2 (0.8)	<0.05
Prucalopride	9⁺ (3.1)	0	0⁻	<0.05
Linaclotide	25⁺ (8.5)	1⁻ (0.7)	5⁻ (2.1)	<0.001
Rifaximine	6⁻ (2.0)	12⁺ (8.2)	13 (5.5)	0.01
Mesalamine	9 (3.1)	6 (4.1)	3 (1.3)	ns
Herbal remedies	6 (2.0)	4 (2.7)	9 (3.8)	ns
Psychotherapy	44 (15.0)	19 (13.0)	29 (12.2)	ns
Antidepressant drugs (TCA/SSRI)	0 (0.0)	0 (0.0)	1 (0.4)	ns
Loperamide	0 (0.0)	18 (12.3)	7 (2.9)	<0.001
Other	41 (13.9)	14(9.6)	28 (11.8)	ns

⁺/⁻Observed frequencies greater (+) than or less (−) than chance (adjusted residual analysis).
§Chi-square test.

than in males. No relationship was found between age and SF12 changes.

No difference was found between patients with a first IBS diagnosis and patients with a known IBS regarding the mean values of HADS, SF12 and IBS-SSS.

4. Discussion

The present study, carried out on a large cohort of Italian IBS patients in 26 Italian Gastrointestinal Units on behalf of the Italian Association of Hospital Gastroenterologists and Endoscopists (AIGO), enables evaluation of important demographic and clinical features of IBS patients and the Italian gastroenterologists' diagnostic and therapeutic approach to this syndrome.

We think that our data are very representative of the Italian scenario because they were collected in every part of Italy, in secondary and tertiary referral centers, both in hospital and university settings.

IBS-C (43.4%) was more frequent than IBS-D (21.6%) and IBS-M (35.0%), with a slight, even if non- statistically significant, prevalence of females in IBS-C. The IBS subtypes seem different in the different cohort of patients also when the nationality is the same. In this regard, different prevalence subtypes were found in the Swiss cohort [25] of 172 patients with IBS diagnosed according to Rome III criteria reporting a prevalence of 23% in IBS-C, 37% in IBS-D, 16% in IBS-M and reaching 24% in IBS-unsubtyped. In the Brazil cohort [26] of 113 IBS patients, the most common subtype was IBS-D (46%), followed by IBS-C (32%), and IBS-M (22%). This data supports the idea that the prevalence of IBS subgroups strongly depends on the different social, psychological, cultural and nutritional status. In fact, different results of our study were reported also in the Italian study of 150 IBS patients with 47.3% of IBS-D, 32% of IBS-C, and 20.7% of IBS-M [27].

The results clearly show that diagnostic IBS management is largely based on exclusion criteria, rather than being considered a positive diagnosis as the Rome Criteria recommend. Indeed only a few simple blood tests should be mandatory when patients meet the Rome Criteria, whereas more invasive and expensive procedures should be offered to few patients. These could be those with more severe and refractory symptoms or those with "alarm symptoms" [28] such as the so-called "red flags" like fever, weight loss, rectal bleeding, and significant changes in blood chemistry. There should also be investigation of the presence of palpable abdominal masses, any recent onset of symptoms in patients aged over 50 years, the presence of symptoms at night, and a familyhistory positive for celiac disease, colorectal cancer and/or inflammatory bowel disease [18].

In the previous year more than 65% of patients performed routine blood tests and 42% a colonoscopy, the latter being probably inappropriate considering that the mean age of the patients was less than 50 years and therefore far from the age having an "alarm symptom" for an increased risk of colorectal cancer. Unfortunately, even after the evaluation of the gastroenterologist, we observe a further request for colonoscopy in 11% of the patients. These data are far from the recommendations of the British guidelines [29], which state that colonoscopy is appropriate in no more than 5% of IBS patients. In a large US study conducted in the period 1995–2005, among general practitioners and gastroenterologists, the request for a colonoscopy was observed in 14% of IBS cases, although in this study the use of rectosigmoidoscopy (41.6%) [30] was conspicuous. As regards imaging techniques, compared to the study by Ladabaum et al. [30], where the use of high-resource Radiological Imaging such as CT and MRI abdomen reached 23.8%, in our study the number of these **requested** procedures was quite marginal (1.4% and 7.7% referring to CT and MRI). This is probably due to the greater use of abdominal ultrasound (AUS) in Italy; indeed in our study 44.9% of the patients had already undergone an AUS before the gastroenterological exam. Moreover, the gastroenterologists suggested an AUS to 20.4% of their patients. These data are consistent with a previous survey published in 2005 by Bellini et al. [2] in which the authors found that AUS, although not considered to be a specific test for IBS and not included in most management guidelines, was **requested** to 41.3% of IBS patients by their GPs. A successive study carried out in 52 Italian gastroenterological units [7] on a large cohort of constipated patients showed that AUS was performed in 22.6% of IBS-C patients. It is probable that AUS, being non-invasive and easy to perform, is considered useful as a means of reassuring both the patient and the physician, especially when abdominal pain is present.

The unconventional use of prucalopride and mesalamine in IBS deserves special attention. Prucalopride has been approved for chronic constipation, but no trials have been published in IBS

Table 6
Hospital Anxiety and Depression Scale (HADS) and The Short Form (SF) 12 questionnaire in IBS patients. The results are shown according to gender, IBS subtypes and severity of IBS symptoms, respectively.

HADS and SF according to gender

	Sex		
	Female (N = 493)	Male (N = 184)	p
Physical Component Summary — PSC-12 (M ± SD)	43.9 ± 9.1	45.2 ± 8.1	0.12[b]
Mental Component Summary — MCS-12 (M ± SD)	39.0 ± 11.0	41.7 ± 10.1	0.005[b]
HADS — anxiety (%)			0.007[a]
0–7 (Normal)	172⁻ (34.9)	86⁺ (46.7)	
8–10 (Borderline)	130 (26.4)	48 (26.1)	
≥11 (Pathological)	191⁺ (38.7)	50⁻ (27.2)	
HADS — depression (%)			0.013[a]
0–7 (Normal)	288⁻ (58.4)	124⁺ (67.4)	
8–10 (Borderline)	122 (24.7)	45 (24.5)	
≥11 (Pathological)	83⁺ (16.8)	15⁻ (8.2)	
Requested diagnostic test (%)			0.14[a]
No	66 (13.4)	33 (17.9)	
Yes	427 (86.6)	151 (82.1)	
Suggested therapies (%)			0.49[a]
No	31 (6.3)	9 (4.9)	
Yes	462 (93.7)	175 (95.1)	

HADS and SF according to IBS subtypes

	IBS			p
	IBS-C N = 294 (%)	IBS-D N = 146 (%)	IBS-M N = 237 (%)	
HADS — anxiety (%)				0.56[a]
0–7 (Normal)	112 (38.1)	51 (34.9)	95 (40.1)	
8–10 (Borderline)	71 (24.1)	45 (30.8)	62 (26.2)	
≥11 (Pathological)	111 (37.8)	50 (34.2)	80 (33.8)	
HADS — depression (%)				0.09[a]
0–7 (Normal)	165 (56.1)	88 (60.3)	159 (67.1)	
8–10 (Borderline)	77 (26.2)	37 (25.3)	53 (22.4)	
≥11 (Pathological)	52 (17.7)	21 (14.4)	25 (10.5)	
Physical Component Summary — PSC-12 (M ± SD)	44.2 ± 9.7	42.3 ± 8.8	45.5 ± 7.6	0.002[c]
Mental Component Summary — MCS-12 (M ± SD)	39.1 ± 10.8	40.0 ± 11.2	40.3 ± 10.5	0.46[c]

HADS and SF according to severity of IBS symptoms

	IBS-SSS				p
	Normal N (%)	Mild N (%)	Moderate N (%)	Severe N (%)	
HADS — anxiety (%)					<0.001[a]
0–7 (Normal)	4 (100)	50⁺ (58.8)	162⁺ (49.2)	42⁻ (16.2)	
8–10 (Borderline)	0	24 (28.1)	95 (28.9)	59 (22.8)	
≥11 (Pathological)	0	11⁻ (12.9)	72⁻ (21.9)	158⁺ (61)	
HADS — depression (%)					<0.001[a]
0–7 (Normal)	4 (100)	53 (62.4)	240⁺ (72.9)	115⁻ (44.4)	
8–10 (Borderline)	0	27 (31.8)	64⁻ (19.5)	76 (29.3)	
≥11 (Pathological)	0	5 (5.9)	25⁻ (7.6)	68⁺ (26.3)	
Requested diagnostic test (%)					0.16[a]
No	0	19 (22.4)	45 (13.7)	35 (13.5)	
Yes	4 (100)	66 (77.6)	284 (86.3)	224 (86.5)	
Suggested therapies (%)					0.13[a]
No	0	9 (10.6)	21 (6.4)	10 (3.9)	
Yes	4 (100)	76 (89.4)	308 (93.6)	249 (96.1)	
Sex (%)					<0.001[a]
Female	2 (50)	52 (61.2)	228 (69.3)	211 (81.5)	
Male	2 (50)	33 (38.8)	101 (30.7)	48 (18.5)	
Physical Component Summary — PSC-12 (M ± SD)	53.6 ± 2.3	50.0 ± 6.9	46.3 ± 7.8	39.5 ± 8.6	<0.001[c]
Mental Component Summary — MCS-12 (M ± SD)	48.7 ± 6.1	44.5 ± 9.8	42.7 ± 9.4	34.2 ± 10.5	<0.001[c]
Age (M ± SD)	52.5 ± 4.7	45.3 ± 16.2	44.0 ± 15.3	41.0 ± 14.9	0.03[c]

⁺/⁻ Observed frequencies greater (+) than or less (−) than chance (adjusted residual analysis).
[a] Pearson chi-square.
[b] Mann–Whitney test.
[c] Kruskal–Wallis test.

patients with constipation even if typical abdominal symptoms of IBS can respond well to prucalopride. As regards mesalamine, a recent study [31] concluded that this treatment was not superior to placebo in IBS-D patients and only a subgroup of patients had a sustained therapy response with some benefits.

Despite the great attention of Italian public opinion paid to gluten-related diseases, and the inclusion of serology for celiac disease among basic blood tests in the most recent guidelines on IBS [28], fewer than 15% of patients had already undergone a celiac serology in the previous year; correctly greater attention was paid by gastroenterologists to a possible presence of celiac disease, espe-

cially in IBS-D and IBS-M, emphasizing the adherence to the current guidelines.

The results of our study show an anxious pathological state in more than 1/3 of the patients, while a pathological depressive state was observed in 14.5% of cases. This aspect was more pronounced in the female sex, where pathological anxiety reached 39.1% and pathological depression 16.8%. Patients with constipation (IBS-C) had a higher frequency of anxiety and pathological depression, in 37.8% and 17.7% of the cases, respectively. The high prevalence of these psychopathological features confirms the usefulness of psychological assessment in IBS patients. Just a brief self-evaluation scale could probably be used in clinical gastroenterological practice, revealing psychopathological aspects able to influence the perception and the severity of gastrointestinal symptoms.

According to the results of this work, the therapeutic approach is confirmed to be very varied and quite heterogeneous. Before the gastroenterological assessment, patients had taken more frequently herbal remedies, stimulant laxatives and lactulose/lactitole, which are not among the drugs frequently prescribed by Italian gastroenterologists, who use a wider variety of approaches, including innovative therapies. In fact, they suggested to their patients drugs such as probiotics, macrogol, fibre supplements with a greater use of psychotherapy in all IBS subtypes and of macrogol and linaclotide in cases of IBS-C. These results are only slightly different if compared to those of the previous study of Bellini et al. [7], showing that dietary and life style modifications, macrogol, fiber supplements, probiotics were the most frequently suggested remedies.

Despite the observed high frequency of psychiatric comorbidity in patients with IBS in our study, confirmed by other Italian studies [9,13] in which anxiety and depression were highly prevalent, the use of anxiolytic drugs and antidepressants prescribed by gastroenterologists was minimal. In our study the use of antidepressants, both tricyclic (TCAs) and selective serotonin reuptake inhibitors (SSRIs), was very low compared to that reported by the American study of Stasi et al. [27] (25% and 30%, respectively). Probably this is due to a low tendency of both Italian gastroenterologists and GPs to use this kind of drug, often considered as reserved only to use by psychiatrists and psychologists. Probably the Italian gastroenterologists prefer to address their patients to these kind of specialists: indeed psychotherapy, prescribed in the previous year to only 1.5% of the patients, was suggested to 13% of patients after the gastroenterological evaluation. Indeed, a recent Italian study [27] confirms a high prevalence of psychiatric comorbidities in IBS patients, emphasizing the need for a psychiatric screening; moreover, the longitudinal evaluation of the IBS patients treated with paroxetine showed a significant improvement in both psychiatric and gastrointestinal symptoms.

A specific training programme of gastroenterologists in psychodiagnostic assessment could be useful because IBS patients are a large part of the routine gastroenterological workload. It could allow physicians to better identify psychopathological conditions requiring specific psychological/psychiatric aid.

The present study has some limitations. Firstly, there is the non-blind participation of gastroenterologists in AIGO centres. Moreover, gastroenterologists might have been slightly biased before undertaking the consultation as they may be more aware of the need to follow guidelines.

Secondly, it was unclear if diagnostic tests performed in the previous year and the therapies already followed by the patients had been suggested by a GP or by a gastroenterologist or had been autonomously chosen by patients themselves. These are mainly due to the fact that our study was aimed at the analysis of real life, because currently, in Italy, very few data are available about real-world large-scale assessment and management of IBS patients.

We think that a better knowledge of clinical data coming from real life could enable gastroenterologists to identify some features of the IBS population not completely known and which deserve to be more deeply investigated. Indeed, adequately diagnosing and treating IBS is not a useless task because it has a critical impact not only on patients' quality of life but also on health-related costs, as demonstrated by the amount of the working days lost and GPs examinations that had taken place in the previous year.

In conclusion, despite the presence of many international guidelines, the management of IBS (both diagnostic and therapeutic) still remains largely inappropriate. Further studies on the pathophysiological mechanism of IBS are crucial in order to identify therapies that target the different IBS symptoms. Moreover, training courses, shared between GPs and gastroenterologists, would be welcome to achieve a greater appropriateness of approach, both diagnostic and therapeutic. The frequent presence of psychiatric comorbidity in IBS patients requires multidisciplinary management of these patients and an adequate knowledge on the possible use of anxiolytic and antidepressant drugs.

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Conflict of interest

None declared.

Appendix A.

Coauthors: Maurizio Carrara[K], Francesco Cabras[l], Vito Guerra[m], Salvatore Camilleri[n], Dario Gambaccini[o], Leonardo Tammaro[p], Lucia D'Alba[p], Luigi Turco[q], Paolo Gasparini[r], Attilio Solinas[s], Giovanni Russo[t], Andrea Pancetti[u], Beatrice Salvioli[v], Andrea Anderloni[v], Gabrio Bassotti[w], Maria Antonia Lai[x], Matteo Antonino[y], Manuela De Bona[z], Sandro Boschetto[A], Silvia Rentini[B], Piera Rossitti[C], Eugenio Limido[D], Antonio Balzano[E]

[K]Department of Gastroenterology, Orlandi Hospital, Bussolengo, Verona, Italy

[l]Brotzu Hospital, Cagliari, Italy

[m]National Institute of Gastroenterology "S. De Bellis" Research Hospital, Castellana Grotte, BA, Italy

[n]San Cataldo Hospital, Caltanissetta, Italy

[o]Gastroenterology Unit, University Hospital of Pisa, Pisa, Italy

[p]San Giovanni Addolorata Hospital, Roma, Italy

[q]Copertino Hospital, Lecce, Italy

[r]San Carlo Borromeo Hospital, Milan, Italy

[s]USL Umbria 1, Perugia, Italy

[t]Sant'Andrea Hospital, La Spezia, Italy

[u]Gastroenterology Unit, Department of Translational Research and New Technologies in Medicine and Surgery, University of Pisa, Pisa, Italy

[v]IRCCS Humanitas Research Center, Rozzano, Milan, Italy

[w]Gastroenterology & Hepatology Section, Department of Medicine, University of Perugia Medical School, Perugia, Italy

[x]Monserrato Hospital Cagliari, Italy

[y]Riuniti Hospitals of Foggia, Foggia, Italy

[z]Feltre Hospital, Belluno, Italy

[A]Rieti Hospital, Rieti, Italy

[B]University Hospital of Siena, Siena, Italy

[C]S. Maria della Misericordia Hospital, Udine, Italy

[D]S. Anna Hospital, Como, Italy

[E]National Medical Specialization Center, AORN Cardarelli, Napoli, Italy

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