

Manning Criteria in Irritable Bowel Syndrome: Its Diagnostic Significance

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Background: Irritable bowel syndrome is one of the most commonly encountered gastrointestinal disorders, for which there are no established diagnostic criteria. Thus, a diagnosis of IBS is made by exclusion of any organic diseases. Recently, important attempts for the positive diagnosis of irritable bowel syndrome by questionnaire surveys of physical symptoms have been made. We performed a questionnaire survey to evaluate the diagnostic value of the Manning criteria and to observe the major symptoms in irritable bowel syndrome.

Methods: A symptom questionnaire which consisted of 22 items, including 6 cardinal symptoms of the Manning criteria, were answered by 172 outpatients who had gastrointestinal complaints. According to a final diagnosis based on independent clinical evaluation, all patients were categorized in three groups: irritable bowel syndrome group, nonulcer dyspepsia group and organic gastrointestinal disease group. The results of the questionnaire were analyzed for each group.

Results: The sensitivity and specificity of the Manning criteria for the diagnosis of irritable bowel syndrome were 67% and 70% if three or more items were regarded as positive. The mean score and overall frequency of the Manning criteria were significantly higher in irritable bowel syndrome group than in nonulcer dyspepsia ($p < 0.01$) or organic gastrointestinal disease group ($p < 0.05$). Among subgroups of the irritable bowel syndrome group, the pain-predominant subgroup showed a significantly higher score and overall frequency than the painless subgroup ($p < 0.05$).

Conclusions: The Manning criteria would be useful as a simple and reliable backup tool for the diagnosis of irritable bowel syndrome and seem to be more useful in pain-predominant subgroup. More detailed history-taking should prevent unnecessary extensive investigations for the diagnosis of irritable bowel syndrome.

Key Words: Irritable bowel syndrome (IBS), Manning Criteria

INTRODUCTION

Irritable bowel syndrome (IBS) is a very common clinical condition characterized by abdominal pain and alteration of bowel habits, or both, as the main symptoms. But these symptoms are also common in organic gastrointestinal diseases, and there are no established pathophysiologic mechanism and diagnostic procedure in IBS. Thus, a diagnosis of IBS is generally made by exclusion of

any organic gastrointestinal diseases with similar symptoms.

It is amazing to see the expensive, dangerous and extensive workups to which healthy patients are subjected by physicians searching for an organic cause in patients who obviously suffer from IBS. It is difficult to decide how extensive investigations should be before the diagnosis of IBS may be accepted with reasonable confidence. To overcome this obstacle, important attempts for positive diagnosis of IBS from physical symptoms have been made by questionnaire surveys¹⁻⁶. The application of refined symptoms criteria, selected from questionnaire surveys, may permit a more positive diagnosis of IBS and may help minimized

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the investigative procedures to exclude organic causes. Manning et al.¹⁾ have shown that certain symptoms derived from a 15-items questionnaire differentiated patients with IBS from patients with organic diseases. Subsequently, this empirical approach has been used commonly in clinical researches²⁻⁶⁾, yet there are few data to confirm the validity of the Manning criteria. The purpose of the present study was to evaluate the reliability and discriminatory value of the Manning criteria in the differentiation of IBS from organic diseases and nonulcer dyspepsia. We also examined the frequency of additional symptoms to determine if other symptoms would provide additional discriminatory value.

MATERIALS AND METHODS

1. Patients

We studied 172 patients who attended the outpatient clinic of the Department of Internal Medicine, Chungang University Hospital in 1991-1992 for the management of gastrointestinal complaints. All patients who consented to participate completed a questionnaire before their diagnostic evaluations. The final diagnosis for each patient was based on an independent clinical evaluation, supplemented by the results of investigations including endoscopy and barium studies. Responses to the questionnaire were not shown to examining physicians and were not used to arrive at the final diagnosis. According to the final diagnosis, all subjects were categorized in several groups and subgroups as follows: (1) Irritable bowel syndrome group: pain-predominant subgroup (pain > 6 times/year) versus painless subgroup (pain ≤ 6 times/year), constipation - predominant subgroup (stool < 3 times/week or often hard) versus diarrhea-predominant subgroup (stool ≥ 3 times/day or often loose), male subgroup versus female subgroup. (2) Nonulcer dyspepsia group. (3) Organic gastrointestinal disease group: upper bowel subgroup, lower bowel subgroup, other disease subgroup. The results of the questionnaire were analyzed for each group and each subgroup.

2. Questionnaire

The questionnaire used for the present study was modified from that of Talley NJ⁷⁾. The questionnaire contained 22 items: 6 cardinal symptoms of the Manning criteria and 14 additional gas-

trointestinal symptoms. The six cardinal symptoms were (1) visible abdominal distension, (2) pain relief with defecation, (3) looser stools at pain onset, (4) more frequent stools at pain onset, (5) mucus per rectum, (6) feeling of incomplete evacuation.

3. Statistical Analysis

Kruskall-Wallis test was used to compare the overall frequency of the Manning criteria among the groups. Wilcoxon's rank-sum test was used for the comparisons of this frequency among subgroups of the IBS group. Anova t-test and Chi-square test were used to compare the Manning criteria score (Number of criteria present) and the frequency of individual symptoms among the groups. Correlations between the Manning criteria score and several factors (sex, age, presence of abdominal pain) were evaluated by multiple regression analysis. Internal consistency of our questionnaire, using Cronbach's α , was 0.78.

RESULTS

The characteristics of patients are summarized in Table 1. There were 58 patients with IBS, 27 patients with nonulcer dyspepsia and 87 patients with organic gastrointestinal diseases. The mean age of IBS group was younger than that of organic gastrointestinal disease group (34.4 years vs. 42.5 years). In IBS group, patient's mean age was 36.2 years in male and 33.0 years in female, and there was a slight female preponderance.

The Manning criteria scores in each group and subgroups are shown in Table 2. The mean score of IBS group was higher than in nonulcer dyspepsia group and organic disease group (3.10 ± 1.39 vs. 1.14 ± 1.16 , $p < 0.01$; 1.82 ± 1.55 , $p < 0.05$). Among IBS subgroups, the pain-predominant subgroup showed a higher score than the painless subgroup (3.38 ± 1.39 vs. 2.63 ± 1.29 , $p < 0.05$). The diagnostic sensitivity and specificity of the Manning criteria were 67% and 70% if three or more symptoms were regarded as positive, and 84% and 55% if two or more symptoms were regarded as positive.

In IBS group, the overall frequency of six cardinal symptoms of the Manning criteria was significantly higher than in nonulcer dyspepsia group ($p < 0.01$) and organic gastrointestinal disease group ($p < 0.02$). Among the six symptoms of the Manning criteria, two symptoms, 'more frequent stools at pain onset' ($p = 0.01$) and 'pain relief with

Table 1. Characteristics of Patients

Final Diagnosis	Patients	Mean Age (Range)	M:F
Irritable Bowel Syndrome	58	34.4 (19-62)	25:33
Nonulcer Dyspepsia	27	40.2(20-68)	8:19
Organic Gastrointestinal Disease	87	42.5(15-75)	47:40

Table 2. Manning Criteria Scores in the Various Disease Groups

Final Diagnosis	Score Distribution*							Frequency		Mean Score
	0	1	2	3	4	5	6	≥2	≥3	
Irritable Bowel syndrome (n=58)	1	8	10	15	15	7	2	84%	67%	3.10±1.39
Pain-predominant (n=36)	0	4	6	8	10	6	2	89%	72%	3.38±1.39
Painless (n=22)	1	4	4	7	5	1	0	77%	59%	2.63±1.29
Nonulcer Dyspepsia (n=27)	10	8	5	3	1	0	0	33%	15%	1.14±1.16
Organic Gastrointestinal Disease (n=87)	21	24	12	13	11	6	0	48%	34%	1.82±1.55
Upper Bowel (n=51)	15	14	7	7	6	2	0	43%	29%	1.62±1.52
Lower Bowel (n=16)	2	5	2	2	2	3	0	56%	44%	2.25±1.65
Others (n=20)	4	5	3	4	3	1	0	55%	40%	2.00±1.15

*Score; Number of Manning Criteria present

Table 3. Frequency (%) of the Manning Criteria in the Various Disease Groups

Disease Subgroups	IBS Pain-Predominant n=36	IBS Pain-less n=22	IBS Total n=58	NUD n=27	OD Upper Bowel n=51	OD Lower Bowel n=16	OD Others n=20	OD Total n=87
1.Looser Stools at pain onset	61	55	59	22	29	36	40	33
2.More frequent stools at pain onset*	67	41	57	11	25	31	25	26
3.Pain relief with defecation**	61	55	59	22	29	31	40	32
4.Visible abdominal distension	47	27	40	19	22	36	30	26
5.Mucus per rectum	22	14	19	4	6	19	15	10
6.Feeling of incomplete evacuation	81	73	78	37	49	69	50	53

IBS: Irritable Bowel Syndrome NUD: Nonulcer Dyspepsia OD: Organic Gastrointestinal Disease
 IBS vs. OD: *p=0.01 **p=0.04

defecation' (p=0.04), were significantly more frequent in IBS group than in organic disease group (Table 3). Among the IBS subgroups, the overall frequency in the pain-predominant subgroup was higher than the painless subgroup (p=0.02), but no significant difference was found between the male subgroup and the female subgroup (p=0.34) and between the constipation-predominant subgroup and the diarrhea-predominant subgroup (p=0.42). Only one symptom was significantly associated with female gender, 'visible abdominal distension'(p=0.02) (Table 4).

Frequency of the additional symptoms is summarized in Table 5. IBS group complained more

frequently of abdominal distension, flatus, belch or indigestion, longer duration of symptom, and stress or nervous character than organic gastrointestinal disease group. But only 'stool≥3/day or often loose (>1/4)' was significantly more frequent in IBS group (Table 5).

The Manning criteria score was closely correlated to the presence of abdominal pain (r=0.672, p<0.001), but not to age (r=0.034, p=0.16) or sex (r=0.010, p=0.93).

DISCUSSION

Irritable bowel syndrome (IBS) has been report-

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ed to account for 20-50% of referrals to the gastroenterology clinic⁸⁾ and 14-22% of selected, apparently health adults in questionnaire surveys⁹⁾. One recent epidemiologic data showed that IBS was the most common diagnosis accounting for 10.4% of all digestive disease diagnoses in the United States¹⁰⁾. Also Sandler's prevalence data indicated a prevalence rate of 2.9%, so nearly 5 million people have had IBS. There are between 2.5 and 3.5 million physician visits yearly, and more than 2 million prescriptions are written¹¹⁾.

At present, pathophysiologic mechanism, cause of chronic symptom complex of IBS, is largely unknown, but thought to be primarily altered gastrointestinal motility. Patients with IBS have been shown to exhibit exaggerated sigmoid motor

response¹²⁻¹⁴⁾, delayed gastrocolic response to meal^{15,16)}, predominant frequency of 3 cycles/minute in colonic myoelectric activity^{16,17)}, lowered visceral sensory threshold to pain caused by balloon distension^{18,19)}, abnormal rectal sensitivity and pressure response to balloon dilation²⁰⁾, altered visceral afferent mechanism²¹⁾, modified small bowel motility²²⁾, delayed colonic transit of diets^{23,25)} and associations with neurohormonal effect or gastrointestinal hormones. Also, evidence of significant psychological disturbance may be seen in some patients with IBS^{26,28)}, but reported higher prevalence of psychopathology among the patient population with IBS may be due to behavioral influences that lead to health care seeking²⁹⁾.

In spite of many previous studies, a diagnosis of IBS may still be made by exclusion of any organic gastrointestinal diseases with similar symptoms. Clinicians who are afraid of overlooking organic disease, including malignancy, tend to make the diagnosis of IBS with reluctance and to pursue extensive, often unnecessary investigations. To overcome these problems, questionnaire survey methods have been introduced. Several investigators have attempted to identify more specific symptoms and physical findings that would enable them to distinguish IBS from organic gastrointestinal disease. Manning et al.¹⁾ have shown that six cardinal symptoms derived from a 15-items questionnaire differentiated patients with IBS from other patients at a 84% of sensitivity. Talley et al.⁷⁾

Table 4. Gender Difference of the Manning Criteria (% Frequency) in Irritable Bowel Syndrome

Manning Criteria	Male	Female	P value
1. Looser Stools at pain onset	68	52	0.52
2. More frequent stools at pain onset	60	55	0.82
3. Pain relief with defecation	64	55	0.71
4. Visible abdominal distension	16	58	0.02
5. Mucus per rectum	24	15	0.48
6. Feeling of incomplete evacuation	80	76	0.89

Table 5. Frequency (%) of Additional Symptoms

Disease Subgroups	IBS Pain-Predominant n=36	IBS Pain-less n=22	IBS Total n=58	NUD n=27	OD Upper Bowel n=51	OD Lower Bowel n=16	OD Others n=20	OD Total n=87
1. Stool <3/week or often hard (>1/4)	36	9	26	26	16	25	30	21
2. Stool ≥3/day or often loose (>1/4)*	39	64	48	11	20	38	10	21
3. Irregular bowel habit	22	14	19	11	10	13	10	11
4. Feeling of abdominal distension	75	64	71	59	51	44	50	49
5. Flatus	61	69	64	14	44	43	47	45
6. Belch or indigestion	78	81	79	100	81	43	58	66
7. History of blood in stool	17	27	21	11	16	36	10	18
8. Weight loss	28	32	29	33	27	31	20	26
9. Duration of symptoms ≥2 years	67	41	57	52	16	25	30	32
10. Regularity of symptom onset time	39	27	34	52	41	25	70	56
11. Stress or nervousness	92	95	93	81	86	69	85	83

IBS: Irritable Bowel Syndrome NUD: Nonulcer Dyspepsia OD: Organic Gastrointestinal Disease
IBS vs. OD: *p < 0.01

have applied this criteria to 361 patients by questionnaire survey. Its diagnostic sensitivity and specificity for IBS were 56% and 77%. Kruis et al.⁵⁾ have reported a weighted scoring system for the diagnosis of IBS incorporating the case history, physical findings, and some basic investigations with a 83% of sensitivity and a 97% of specificity. Similarly, Talley's scoring system with high reliability was introduced^{4,30)}. However, there was some dispute about the limitation of questionnaire surveys in the differentiation of IBS from organic lower bowel disease³¹⁾.

Our results were similar to those of previous studies. Diagnostic sensitivity and specificity of the Manning criteria were 67% and 70%. The Manning criteria score and overall frequency were significantly higher in patients with IBS than in patients with nonulcer dyspepsia or organic gastrointestinal disease. Among subgroups of the IBS groups, the pain-predominant subgroup showed higher score and frequency than the painless subgroup. Also, regression analysis showed close correlation between the Manning criteria score and presence of abdominal pain. With the above results, we expect that the Manning criteria is useful as a backup tool for the diagnosis of IBS and more specific in pain-predominant IBS subgroup. Among the individual symptoms, 'more frequent stools at pain onset' and 'pain relief with defecation' were significantly more frequent in IBS group compared with organic gastrointestinal disease group. These two symptoms were in concordance with 'irritable bowel factors'³²⁾, which were relief of pain with defecation, looser stools with pain onset, more frequent stools with pain, and gastrointestinal reactions to eating. Additional symptoms with significant difference were not found, which coincides with the results of Talley et al.⁷⁾. Smith et al.³³⁾ reported that the Manning criteria is significantly associated with the female gender³³⁾ but, in our study, gender difference was not found. Only one criterion, 'visible abdominal distension', was more frequent in female than in male.

There are some limitations for the results of a questionnaire to be applied to the general population due to unavoidable impairment of scientific accuracy, large variability of subjectively complained symptoms and their tolerance, and different sociocultural or psychological situation for health care seeking behavior^{34,35)}. Despite these problems, our study indicates that the Manning

criteria is reasonably specific and of diagnostic value. Development of better diagnostic criteria, with improved accuracy by some modification based on further studies, should prevent unnecessary, extensive investigations for the diagnosis of IBS.

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