Irritable Bowel Syndrome and Stress

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Abstract: The aim of this review is to make clear the relationship between irritable bowel syndrome (IBS) and stress. From a pathophysiological viewpoint, IBS is an abnormality in brain-gut interaction, motility of the digestive tract and visceral perception. Confirmation of the stress itself is not necessary to make the diagnosis but it relates to the onset, severity, or course of the disease. Cognitive behavior therapy may reduce the symptoms and stress. Even if the patients succeed in coping with their stress, some of their symptoms may last for a long time. The therapeutic goal is not a symptom free state but self-control of symptoms. These therapies rely on the relationship between the patient and the therapist.

Key words: Irritable bowel syndrome; Stress; Brain-gut interaction; Cognitive behavior therapy

Introduction

The enteric nervous system (ENS) contains almost as many neurotransmitters as the brain itself. This fact suggests that the brain-gut axis may play an important role in the pathogenesis of stress-related diseases. It is well known that stress affects gut motility and perception. The most popular conceptualization of irritable bowel syndrome (IBS) is as one of the stress-related disorders, and that its symptoms are generally manifest in the presence of intense emotional or psychological stimuli. The aim of this review is to present the diagnosis, pathophysiology, therapies, and stress coping methods of IBS.

Definition of IBS

IBS is a functional gastrointestinal disorder, a term which covers a range of symptom complexes affecting the gastrointestinal tract. There has been a Rome working team report on diagnostic criteria for IBS. The Rome II working team developed new criteria (Table 1).

The Rome II criteria is simple, the diagnosis of IBS being based on the presence of two out of three main diagnostic criteria alone. In recognizing IBS, careful interpretation of the abdominal pain and stool form is needed. Abdominal pain related to defecation is likely to be a bowel pain, while that associated with exercise, movement, urination, or menstruation may have a different cause. Postprandial

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symptoms have little value in discriminating IBS from other diseases. Many women with IBS consult a gynecologist for lower abdominal pain (pelvic pain). There are other gastrointestinal, somatic, and psychological symptoms, so-called non-colonic symptoms, in patients with IBS. These may include globus, headache, backache, urinary symptoms, and psychogenic symptoms. But, non-colonic symptoms are not essential for the diagnosis. Among patients with IBS, stress produced changes in bowel function, but no particular stress events or bowel responses were found to be characteristic of IBS. The alarm symptoms or signs that are not explained by functional disturbance of the digestive tract should be determined (Table 2). A physical examination is important to exclude other diseases and, to provide the reassurance for the patient by the physician. Unnecessary investigations should be avoided.

### Brain-Gut Interaction

It has been a popular notion that the manifestations of IBS include emotional and perceptual components, which are suggestive of the brain-gut interaction. Several studies have shown an alteration in bowel function during sleep and specific sleep disturbances in patients with IBS, suggesting that altered CNS function may be playing an important role in the pathogenesis of IBS. Using PET (positron-emission tomography) scanning, it appears that the activated portions of the brain cortex by the stimulation of sigmoid distention in patients with IBS are different from control subjects. The enteric nervous system contains almost as many neurotransmitters as the brain itself. These transmitters form important relationships between gut function and stress.

### Table 1 Diagnostic Criteria* for IBS

At least 12 weeks or more, which need not be consecutive, in the preceding 12 months of abdominal discomfort or pain that has two out of three features:

1. Relieved with defecation; and/or
2. Onset associated with a change in frequency of stool; and/or
3. Onset associated with a change in form (appearance) of stool

* In the absence of structural or metabolic abnormalities to explain the symptoms.

(From Thompson, W.G. et al.: Gut 1999; 45 (Supple 2): I143–I147)

### Table 2 Investigation of IBS, Alarm Symptoms and Signs

| 1. Test | 1) Full blood count (WBC, RBC, Hb), C-reactive protein, Urinary analysis, Blood biochemistry (total protein, GOT, GPT, γ-GTP)  
2) Fecal occult blood (immunochemical method) |
| 2. Alarm symptoms or signs | 1) Abnormal physical examination  
2) Loss of body weight within 6 months (over 3 kg)  
3) History of organic colon diseases/family history  
4) Age over 50 years  
5) Nocturnal abdominal pain  
6) Fever, joint pain  
7) Bloody mucus in stools |
Motility, Perception, and Stress

Acute stress and emotional arousal may induce the change of the colonic motilities. Colonic motilities show exaggerated patterns when IBS patients are under the stress. There are no specific findings of the colonic motility pattern seen in IBS, but several principal motility abnormalities are seen in it. IBS patients report pains to be less intense when a balloon is inflated in the colonic lumen. It is assumed that visceral hyperalgesia is seen in IBS patients due to the decrease of the perceptual sensitivity threshold induced by intraluminal balloon distention. Whitehead et al. examined by meta-analysis whether visceral hyperalgesia is a diagnostic biological marker of IBS, and psychological factors have an influence on perceptual sensitivity in IBS patients or not. Many of these findings cannot be explained on the basis of biological differences between patients with IBS and controls. It may be confirmed that psychosocial stressors have an influence on the pain threshold in patients with IBS.

Therapies in Primary Care

There are no convincingly effective therapies for IBS. In IBS patients, there is much heterogeneity in disease severity, nature of symptoms, pathophysiologies, and psychosocial factors. The ideal therapy for IBS may be individual treatment planned out for each condition, but it may be difficult to make treatment strategies due to the great number of profiles of IBS patients. The clinical trial evidence for the efficacy of drugs is relatively thin. Physicians can only use several psychotherapies skillfully.

1. Explanation and therapeutic relationship
The important therapeutic tools for the physician are listening to the patients’ worries with a sympathetic attitude, and careful explanation of the examined data and pathophysiologies of the IBS. These must be done based on effective patient-doctor relationship.

2. Life style modification
Some IBS patients may have an impaired life style. Habitual bad conditioning may produce abnormal bowel movement or abdominal pain. Physicians must point out these factors and environmental stress surrounding the patient, and give advice about life style modification and environmental adjustment. Cognitive behavior therapy may be helpful for reduction of patient’s symptoms and to change their way of thinking about their symptoms. Self-monitoring by the patients is usually very beneficial and an important method in cognitive behavior therapy. Homework diaries on diet, bowel movement, sleep quality, and stress are useful as they enable the patient to understand the relation between their symptoms and stress.

3. Dietary modification
Consumption of adequate amount of soluble fiber may alleviate symptoms of the patients with IBS. Insoluble fiber also improves bowel movement, but it often increases gas production in the intestine, and causes abdominal fullness.

4. Drug treatment
(1) Pharmacological therapy targeted at somatic symptoms
The drugs for treatment of IBS should be chosen for target symptoms of the patients. Symptoms are likely to include bowel symptoms and extra-colonic symptoms. For abdominal pain, tricyclic antidepressants are used in lower doses than are needed for depression because of analgesic effects on visceral sensation. In patients with diarrhea-predominant IBS, antidiarrhoeal agents, such as loperamide are useful, and when constipation is predominant, stool softeners such as low doses of magnesium oxide are useful. But, these drugs are limited to only symptomatic treatment. Calcium polycarbophil is a synthetic soluble fiber, and effective for both diarrhea and constipation.
(2) Psychopharmacologic drugs
Anxiolytics are occasionally used to help ameliorate stress-induced anxiety and nervous tension, or fear caused by physical symptoms.
Tricyclic antidepressants should be given in full doses when depression can be identified. A poor clinical response may be due to insufficient doses.

5. Stress management
Once the patients have recognized that stress triggered disease onset, or affected their symptoms and course of disease, they should identify the following facts by self-monitoring, and listing.
(1) their signs of stress
(2) the probable cause of their stress
(3) the changes in the nature, severity, and duration of their stress
There are two strategies to defend against stress. One is mental fitness and the other is physical fitness.

1) Mental fitness includes self-control of symptoms such as looking out for unhelpful thoughts that do not have factual basis, and thinking of new solutions or trying to reduce stress by having interests. Relaxation techniques are useful. Autogenic training or progressive relaxation may be helpful for self-control of symptoms.

2) Physical fitness means regular exercise, aerobic dance, sports, and so on, enjoying oneself within the limits of physical abilities and interest.
Social support from the patient’s friends, neighbors, colleagues, or pets may help for reducing stress.

Therapy by Specialist
There are a few IBS patients who resist to standard therapies, so are called super-patients. Primary care physicians do not treat these patients for a long time, and it is better to send them to specialists.

Conclusion
IBS is a disease suffered by both the brain and the gut. Stress itself is not necessary to make the diagnosis but it is related to disease onset, severity, or course of the disease. One good way to cope with stress is cognitive behavior therapy. Even if the patients succeed in reducing their stress, some of their symptoms may last for a long time. The therapeutic goal is not a symptom free state but self-control of symptoms.

REFERENCES