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Chairman of Chinese Digestive Psychosomatic Union
Chief of Chinese Association of Psychosomatic Digestive Diseases
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Integration of traditional Chinese medicine and Western medicine in the management of psychosomatic gastrointestinal disorders

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Abstract: Psychosomatic gastrointestinal disorders are a great challenge in the clinical practice of traditional Chinese medicine and Western medicine. The progress in the mechanism research for psychosomatic gastrointestinal disorders in Western medicine, such as gut-brain interaction, leaky gut syndrome, and intestinal microbiota, conforms to the holistic concept of the integration of mind and body in traditional Chinese medicine, especially the “five viscera” theory. This mini-review discussed how to achieve the integration of theories and therapies of traditional Chinese medicine and Western medicine in the management of psychosomatic gastrointestinal disorders.

Key words: Western medicine; traditional Chinese medicine; integration; psychosomatic gastrointestinal disorders

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Introduction

In recent years, the development of social economy and acceleration of pace of life have resulted in an increase in psychosomatic stressful events, which exacerbate the clinical challenge of psychosomatic gastrointestinal (GI) disorders, including functional GI disorders (FGIDs), also known as disorders of gut-brain interaction (DGBI) [1,2]. Currently, clinical problems related to psychosomatic GI disorders include: (1) GI disorders caused by psychosomatic factors; (2) GI disorders co-morbid with psychosomatic abnormalities; and (3) Refractory GI disorders that are unresponsive to the routine therapies of Western medicine and require psychoactive therapies. The mounting clinical challenges of psychosomatic GI disorders have inspired interest on the exploration of the pathophysiology and clinical therapeutics. Great progresses have been made, e.g., the naming of the diseases, pathophysiological mechanisms, management thinking, and therapeutic drugs [1-3]. In fact, these progresses have well validated the theories and clinical experience of traditional Chinese medicine (TCM). This review provided an overview of the integration of TCM and Western medicine in the treatment of psychosomatic GI disorders.

Advances in basic and clinical research on psychosomatic GI disorders in Western medicine

The "gut-brain interaction" theory is one of the most prominent advances in the study of the pathogenesis of psychosomatic GI disorders [4-6]. The core of the "gut-brain interaction" theory is the interaction between the central nervous system (CNS) and the neuro-humoral regulatory system in the GI tract. Abnormal alterations in the functional state of the brain caused by the mental and psychological stresses can bring about the disorders of the gut and vice versa. In fact, the essence of the "gut-brain interaction" theory is to understand the mechanisms underlying GI disorders based on TCM theory characterized with holistic concept.

Regulatory mechanisms of brain-gut axis

The mechanisms by which psychological stress affects the function of GI tract include: (1) The alteration in GI motility; (2) The changes in GI secretion, including secretion of gastric acid, digestive enzymes, and mucus, etc.; (3) Abnormal visceral sensation, such as visceral hypersensitivity; (4) Neuroimmune dysfunction, triggering mucosal inflammation; (5) Increased permeability of the intestinal mucosa, leading to impaired mucosal repair; (6) Inappropriate perception of GI health problems, etiology, and coping behavior.

The associations between psychological stress, functional brain area, and GI clinical manifestations have been largely established. Under stress conditions, the changes in the functional state of some brain regions such as the prefrontal, cingulate (especially the anterior cingulate), and insula may result in abnormal GI sensory responses to detrimental stimuli, GI dysmotility, and abnormal inflammatory responses in the GI mucosa. Clinical manifestations can be divided into: (1) Positive emotional responses such as anxiety and irritation, which may be associated with visceral hypersensitivity and dysregulated motor and secretion, causing gastroesophageal reflux disease (GERD), peptic ulcer, abdominal rumbling, and diarrhea, etc. In addition, the accompanied mucosal inflammation tends to be autoimmune reactions; (2) Negative emotional responses such as depression and repression are often associated with the impairment of GI motility and secretion, causing loss of appetite, postprandial fullness, dry hard stools, and lack of stooling, etc. The accompanied mucosal inflammation tends to be low grade inflammation attributable to impaired anti-infection ability.

Regulatory mechanisms of gut- brain axis

"Micro-leaky gut" and "Leaky gut syndrome" are the most important advances in the regulatory mechanisms of the gut-brain axis. Environmental alterations, rhythm disturbance, psychological stress, inappropriate dietary behaviors, imbalance of nutrition, and impairment of anti-infection mechanisms can result in changes in the physical and chemical environment within the lumen, microbiota dysbiosis, impairment of mucosal barrier function, and increase of mucosal permeability. These alterations may increase the detrimental microorganisms and their metabolites in the lumen to break through the mucosal barrier and, together with the harmful products of mucosal inflammatory responses, enter the blood circulation to cause systemic

inflammatory response syndrome (SIRS), leading to multiple organ dysfunction syndrome (MODS) including CNS and GI tract [7, 8].

The role of duodenal inflammation (DI) in the pathogenesis of functional dyspepsia (FD) and the symptom-overlapping in FGIDs have attracted more and more attention in recent years [9, 10]. DI displays several characteristics: (1) DI has been found to exist in patients with FD, especially in FD patients with overlapping GERD or irritable bowel syndrome (IBS). (2) The eosinophil-mast cell axis plays a crucial role in the pathophysiology of DI, indicating associations of DI with psychological stress and food-derived immunogens. (3) DI is accompanied with altered luminal microbiota and metabolomics. (4) The severity of DI correlates with the impairment of mucosal barrier function. (5) Elevation in the content of the inflammatory mediators in the duodenal mucosa correlates with the elevation in their levels in the blood circulation. (6) Attenuation of GI after treatment with proton pump inhibitors (PPIs) is associated with reduced eosinophilic inflammation [11]. Thus, the functional status of the duodenum is a critical factor for the gut-brain interaction.

Management of psychosomatic GI disorders based on advances in the mechanisms of gut-brain interaction

A growing body of evidence has suggested that neuromodulators (NMs), via improving the dysregulated gut-brain interaction, may be beneficial for the treatment of psychosomatic GI disorders [12-14]. Notably, unlike psychiatry department, the choice of therapeutic drugs for GI psychosomatic disorders in gastroenterology department should emphasize the multi-target interventions for the abnormalities of CNS, enteric nervous system (ENS), and CNS-ENS interaction. For example, antidepressants with anxiolytic effects (e.g., tricyclic antidepressants, fluvoxamine, paroxetine, and duloxetine, etc.) are appropriate for GI disorders associated with positive emotions such as anxiety and irritability. Whereas, antidepressants that can enhance mental activity (e.g., fluoxetine, sertraline, citalopram, and venlafaxine, etc.) are appropriate for GI disorders associated with negative emotions such as depression and repression. For sensory abnormalities attributable to psychological factors, multi-target NMs (e.g., antidepressants with additional actions on 5-HT2 receptors, atypical antipsychotics, biorhythm modulators, and sedatives, etc.) may benefit. It should be pointed out that a proportion of patients taking NMs may exhibit stigma associated with the drugs, which may reduce medication compliance of patients [15, 16]. This poses an unnegligible clinical challenge in the treatment of psychosomatic GI disorders with Western medicine.

Currently, the therapeutic drugs targeting at the dysregulated gut-brain interaction mainly include: (1) Drugs that regulate gut microbiota, including probiotics, prebiotics and antibiotic agents that are not absorbed into the circulation in the gut [17,18]. Studies have shown that the efficacy of probiotics for IBS is dose-dependent and the duration of treatment generally needs to be more than 4 weeks, with a maximum duration of 8 to 10 weeks. The efficacy continues for about 4 weeks after discontinuation of probiotic application. There is insufficient evidence to form a consensus on the indications and duration of antibiotic preparations that are not absorbed in the intestine. (2) Drugs that attenuate mucosal inflammation, including cyclooxygenase 1 inhibitors, leukotriene receptor antagonists, histamine H1 receptor blockers, 5-aminosalicylic acid, monoclonal antibodies to inflammatory cytokines, and glucocorticoids (e.g., budesonide). Their efficacy needs further investigation in the future.

The concept of “gut-brain interaction” validates the “five viscera” theory of TCM

The emphasis on the role of “dysregulated gut-brain interaction” in the pathogenesis of psychosomatic GI disorders is in accord with the “five viscera” theory of TCM. In TCM, the “five viscera” are divided according to their function (instead of the anatomy, morphology, and function in the context of Western medicine), based on the traditional Chinese philosophy of the “five elements” (i.e., water, fire, earth, wood, and metal). Each viscus in TCM refers to a unit combining the physical organs with the associated functional aspects in the human body. And, the viscera are closely interrelated. The spleen in TCM, the earth element of the TCM five elements, governs

transportation and transformation. It corresponds to the ability of the digestive system to digest and absorb, thus regulating the body's fluid environment and the nutritional status in the context of Western medicine. The stomach in TCM corresponds to the body's function of ingesting food, coordinating GI transit, and excreting food residues in Western medicine. The liver in TCM, the wood element in the TCM five elements, governs conveyance and dispersion as well as emotions. It corresponds to the functions of the brain areas responsible for emotions and the neuro-humoral system modulating the function of multiple organs of the body in Western medicine. The heart in TCM, the fire element in the TCM five elements, governs mental activities and blood circulation. It corresponds to the ability of cognition and behavioral response to environmental changes in Western medicine. The kidney of TCM, the water element in the TCM five elements, is considered as the congenital foundation or the origin of life. It corresponds to the biological rhythms, growth and development, nutritional status, and immune function in Western medicine. The lung in TCM, the metal element in the TCM five elements, governs the Qi throughout the whole body. In Western medicine, it corresponds to the gas exchange in the respiratory system, as well as the capacity to maintain the body's immune function (via coordination with the digestive system) and energy metabolism (via coordination with the cardiovascular system). From a TCM perspective, the pathophysiology of psychosomatic GI disorders can be explained with the "five viscera" theory, e.g., "failure of the liver to convey and disperse, failure of the heart to control the mind, deficiency of the kidney essence, obstruction of the lung Qi, and failure of the spleen to transport and transform". Emotional disorders leading to the spleen and stomach dysfunction are common in clinical practice, e.g., "liver Qi stagnation and spleen deficiency, liver Qi offending the stomach, and liver and stomach disharmony". The malfunctioning of the spleen and stomach of TCM, in turn, triggers dysfunction of other viscera through improper transportation and transformation, including emotional and mood disorders. Therefore, the "five viscera" theory of TCM conforms to the "gut-brain interaction" concept of Western medicine. On the other hand, the associations of duodenal inflammation with the overlap of upper and lower GI symptoms as well as microbiota dysbiosis in the context of Western medicine also comply with the TCM theory of "spleen and stomach disharmony" for the pathogenesis of psychosomatic GI disorders.

In TCM theory characterized by holistic concept, "spleen and stomach disharmony" means the imbalance of nourishment and transportation, ascending and descending, and dryness and dampness. This concept, similar with the concept of Western medicine, emphasizes to enhance digestive and absorption functions (i.e., the function of the spleen of TCM to transport and transform), coordinate the movement of the stomach and intestine (i.e., regulating stomach Qi), and inhibit mucosal inflammation (i.e., achieving the balance of dryness and dampness) in the management of psychosomatic GI disorders. Moreover, TCM emphasizes individualized treatment of these disorders based on the clinical symptoms of individual patients. Clinical evidence has shown that herbal medicine, such as Zhizhu Kuanzhong capsules benefit for FD patients [19]. The results of our group indicates that application of herbal medicine may improve the patient-doctor communications in the management of psychosomatic GI diseases, with reduction of patients' stigma and improvement of drug compliance (unpublished data).

Prospects

The TCM viscera theory embodies the holistic and pattern differentiation-based-treatment concepts. The recent progress in the mechanism research for psychosomatic GI disorders in Western medicine conforms to the TCM theory of "spleen-stomach disease" based on the holistic concept. The integration of TCM and Western medical philosophy in the clinical diagnosis and therapeutic approaches represents the future direction for the management of psychosomatic GI diseases. TCM approaches may serve as an alternative or supplemental treatment option for psychosomatic GI diseases.

Conflicts of interest statement

None declared.

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