The Effect of Emotional Stress and Depression on the Prevalence of Digestive Diseases

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Background/Aims
Epidemiological data indicate that emotional stress and depression might influence the development of gastrointestinal disorders and cancers, but the relationship between the two is still unclear. The aim was to investigate the effect of stress/depression on the prevalence of digestive diseases. In addition, we tried to identify whether stress and depression are risk factors for these diseases.

Methods
A total of 23,698 subjects who underwent a medical check-up including upper and lower endoscopy were enrolled. By reviewing the subject's self-reporting questionnaire and endoscopic findings, we investigated the digestive diseases, including functional dyspepsia (FD), irritable bowel syndrome (IBS), reflux esophagitis, peptic ulcer disease, and adenoma and carcinoma of the stomach and colon. Stress and depression scores were measured by the Brief Encounter Psychosocial Instrument and Beck's Depression Inventory, respectively (Korean version).

Results
Stress and depression were related to FD, IBS, and reflux esophagitis. Depression was also linked to peptic ulcer disease and adenoma/carcinoma of the colon and stomach. Multivariate analysis revealed that stress and depression were independent risk factors for FD (OR, 1.713 and 1.984; \( P < 0.001 \)) and IBS (OR, 1.730 and 3.508; \( P < 0.001 \)). In addition, depression was an independent risk factor for gastric adenoma/carcinoma (OR, 4.543; \( P < 0.001 \)).

Conclusions
Stress and depression are related to various digestive diseases, and they may be predisposing factors for FD and IBS. Depression may also be a cause of gastric cancer. Psychological evaluation of gastroenterology patients may be necessary, but more study is needed.


Key Words
Depression; Dyspepsia; Irritable bowel syndrome; Stress, psychological
Introduction

Emotional stress and depression can down-regulate various parts of the immune system, which is located in both the central nervous system and the peripheral nervous system, by influences on the principal effectors, such as neurotransmitters, neuropeptides, neurohormones and adrenal hormones. There have been many studies on the association between stress/depression and cancer. Cancer is a heterogeneous disease group with various causes, including chemical carcinogens, immunological, psychological, and behavioural factors. Previous studies have revealed that emotional stress can increase the risk of cancer. Also, the prevalence of depression among cancer patients is known to increase with disease severity and symptoms. However, the association between depression and subsequent cancer incidence is still unclear, although severe and chronic depression may be linked with elevated cancer risk.

On the other hand, previous studies have shown that emotional stress and depression might influence the development of functional gastrointestinal (GI) disorders, such as functional dyspepsia (FD) and irritable bowel syndrome (IBS). However, the association between the organic GI disorders and stress/depression is still unknown; except for a recent study, which reported that reflux esophagitis is associated with emotional stress.

The aim of our study was to investigate the effect of stress and depression on the prevalence of digestive diseases, including FD, IBS, reflux esophagitis, peptic ulcer disease (PUD), and adenoma and carcinoma of the stomach and colon. In addition, we tried to identify whether stress and depression are risk factors for these diseases.

Materials and Methods

Patients

This study was based on the medical records of examinees who underwent upper and lower endoscopy at our center from January 2010 to March 2014. Subjects who did not answer the questionnaires and subjects who refused to undergo a biopsy were excluded from the study. The study was approved by the Institutional Review Board (IRB) of Konkuk University School of Medicine which confirmed that the study was in accordance with the ethical guidelines of the Helsinki Declaration (KUH1010576). After the IRB approval, this study was registered in the Clinical Research Information Service (CRIS) (ID: KCT0001101). All authors had access to the study data and reviewed and approved the final manuscript.

Questionnaires and Definitions

A self-reporting questionnaire was filled out by all the examinees. The questionnaire included the following items: underlying disease, medication history, history of malignant tumor, smoking, alcohol intake, the test for depression, the test for stress, symptoms of dyspepsia and irritable bowel syndrome. Other than the questionnaires, the medical record data of the subject’s age, gender, height, and weight were reviewed.

The Brief Encounter Psychosocial Instrument-Korean version (BEPSI-K) was used to measure the severity of stress. Depression was assessed using the Korean version of the Beck’s Depression Inventory (K-BDI) scoring system. The BEPSI-K is a 5-item self-report questionnaire. The sum of the five items is divided by five for the final score, and a subject with a higher final score experiences more stress. There were 3 groups based on the final score; the score of 0 to 1.8 indicates a low level of stress; 1.8 to 2.8, moderate level of stress; and more than 2.8, high level of stress. Our study considered the total score of ≥ 2.4 as the high stress group.

The BDI consists of 21 self-administered items with scores ranging from 0 to 63. The total score of 0 to 9 indicates no depression; 10 to 15, mild depression; 16 to 23, moderate depression; and 24 to 63, severe depression. We set the cut off value of 10 as positive for depression.

FD was defined as follows: One or more of the following symptoms occurred for more than 3 days per month in the last 3 months: (1) bothersome postprandial fullness, (2) early satiation, (3) epigastric pain, and (4) epigastric burning. Furthermore, there should be no evidence of any structural diseases that is likely to explain the symptoms on upper endoscopy. According to Rome III criteria, IBS was defined as follows: Recurrent abdominal pain or discomfort occurred for more than 3 days per month in the last 3 months, associated with 2 or more of the following symptoms: (1) improvement with defecation, (2) early satiation, (3) epigastric pain, and (4) epigastric burning. Furthermore, there should be no evidence of any structural diseases that is likely to explain the symptoms on upper endoscopy. According to Rome III criteria, IBS was defined as follows: Recurrent abdominal pain or discomfort occurred for more than 3 days per week in the last 3 months, associated with 2 or more of the following symptoms: (1) improvement with defecation, (2) onset associated with a change in frequency of stool, and (3) onset associated with a change in form of stool. In addition, there should be no evidence of any structural diseases that is likely to explain the symptoms on colonoscopy. Heavy drinking was defined as consuming 15 drinks or more per week for men and 8 drinks or more per week for women.