Incidence and Risk Factors of Irritable Bowel Syndrome in Community Subjects with Culture-proven Bacterial Gastroenteritis

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Background/Aims: The aim of this study was to investigate the incidence and risk factors of irritable bowel syndrome (IBS) in community subjects with culture-proven bacterial gastroenteritis.

Methods: This was a prospective, community-based, cohort study, which followed patients with a recent history of culture-proven bacterial gastroenteritis. IBS was diagnosed with the use of the Rome II criteria at 3 and 6 months after bacterial dysentery.

Results: Sixty five cases were included and completed the 6 month follow-up. Thirty four cases (52.3%) were female. Salmonella was the pathogen most frequently identified and seen in 41 patients (63.1%). The cumulative incidence of IBS among patients with microbiologically proven bacterial gastroenteritis within a community was 9.2% and 12.3% at 3 and 6 months of follow-up, respectively. The duration of initial diarrhea (≥ 7 days) was associated with an increased risk for the development of IBS (aOR, 14.50 [95% CI, 1.38-152.72]; p=0.022).

Conclusions: Our study suggests that the incidence of IBS among patients with culture-proven bacterial gastroenteritis within a community is similar to that reported among Western populations. A large, prospective study is encouraged to confirm our results and to evaluate the influence of the microbial species on the epidemiology of IBS in Asian populations. (Korean J Gastroenterol 2012;60:13-18)

Key Words: Irritable bowel syndrome; Bacterial gastroenteritis; Diarrhea
Acute enteric infection has been proposed as a cause of IBS. It has been demonstrated that severe inflammation can impair the functions of the sympathetic nerve. The infiltration of inflammatory cells such as enteroendocrine cells, CD4, and CD8 lymphocytes in the rectal mucosa was found despite the resolution of bacterial infection in stool cultures. In addition, interleukin-1β mRNA expression in the rectal mucosa and terminal ileum significantly increased in patients with post-infectious IBS (PI-IBS) compared to those without IBS after bacterial infection. These studies have provided a basis for understanding the role of enteric infection in developing IBS.

The epidemiological evidence for a relationship between acute bacterial gastroenteritis and the development of IBS has also been studied. A study estimated that the rate of PI-IBS among patients with culture-proven bacterial infections was 4.4%, which was significantly higher than that in the control subjects after a 12-month follow-up period. In addition, it was demonstrated that IBS developed more frequently in patients with bacterial gastroenteritis compared to the controls in a well-designed prospective cohort study. Furthermore, a recent meta-analysis showed that acute gastrointestinal infection significantly increased the risk of developing IBS. Although these studies provide evidence for a relationship between acute bacterial gastroenteritis and developing IBS, marked differences in respect to the incidence of PI-IBS exist among studies. Moreover, there have been few reports which analyzed determining the incidence and risk factors in patients with culture-proven bacterial gastroenteritis among Asian populations.

The Korean government has developed the sentinel surveillance system for communicable disease since 2000. Disweb, an internet-based reporting system established by the Korea Centers for Disease Control and Prevention (KCDC) provides information to the public and health care workers in regard to community patients with legal epidemics such as Salmonella, Shigella, E.coli O157, and Vibrio cholera. Therefore, a prospective observational study for the community subjects with legal enteric infection is an exclusive way to provide the accurate incidence and risk factors of PI-IBS within a community following culture-proven bacterial gastroenteritis in Korea. This was a community-based, prospective cohort study which aim was to elucidate the incidence and risk factors of IBS in patients with culture-proven bacterial gastroenteritis in Korea.

SUBJECTS AND METHODS

1. Study design
This was a prospective, community-based, cohort study, which followed patients with a recent history of bacterial dysentery. The follow-up interview was at 3 and 6 months after acute enteric infection to identify the incidence and risk factors of PI-IBS.

2. Setting
This study was done in Gyeonggi-Do, the national capital region that includes urban, semi-rural, and rural inhabitants. This study was done between January 2008 and February 2010.

3. Participants
The data collected from Disweb has been used for the present study. The access to Disweb was permitted by an epidemic intelligence service officer in Gyeonggi-Do, a co-author of the study. Patients infected with Salmonella, Shigella, E.coli O157, and Vibrio cholera were identified from January 2008 to July 2009 in the Gyeonggi-Do area of Korea. All patients between the ages of 15 and 75 years with culture-proven bacterial gastroenteritis were eligible as cases. Potential patients were contacted by telephone. Interviewers explained the study protocol and obtained verbal informed consent from the patients who agreed to participate in this study. Patients with acute gastroenteritis were defined as showing a positive stool culture or acute onset illness characterized by 2 or more of the following along with a positive blood culture: fever, vomiting, and diarrhea. The exclusion criteria for the cases included the inability to give informed consent, pregnancy, severe psychiatric disease, chronic illnesses that might be predicted to contribute to gastrointestinal symptoms such as cancer, inflammatory bowel disease or hyperthyroidism, and previous abdominal surgery. In addition, patients who had been diagnosed with IBS by a physician before bacterial gastroenteritis were also excluded.