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Epidemiology of irritable bowel syndrome

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Irritable bowel syndrome (IBS) is a functional gastrointestinal disorder characterized by chronic abdominal symptoms in the absence of major mechanical, inflammatory, or biochemical diseases as determined by routine clinical examinations [1]. In the Rome III Diagnostic Criteria for Functional Gastrointestinal Disorders, IBS is defined by abdominal pain or discomfort associated with at least two of the following: symptom relief by defecation; symptoms associated with changes in defecation frequency; and symptoms associated with changes in stool form [1]. IBS is classified into four subtypes according to predominant stool consistency: IBS with constipation (IBS-C); IBS with diarrhea (IBS-D); mixed IBS (IBS-M); and unsubtyped IBS (IBS-U). IBS is not a fatal disease but it does greatly reduce quality of life [2,3].

It was reported that approximately 10-20% of adults in Western countries have IBS symptoms [4,5] and a similar prevalence has been reported in Asia [6-8]. Recently, Lovell and Ford conducted a meta-analysis of studies on the epidemiology of IBS [9] and estimated a global prevalence of 11.2% (95% confidence interval [CI], 9.8-12.8%), a rate that has not changed in the last 30 years. Moreover, they found that the odds ratio of IBS in women has only modestly increased compared with men and that socioeconomic status did not show any effect on prevalence, though there are some conflicting results. Globally, Southeast Asia has lowest prevalence of IBS (7.0%) and South America the highest (21.0%). Regrettably, the prevalence in Africa is not clear as there have been few population-based studies. Such studies are needed in the countries that lack precise epidemiological data.

The criteria used to define IBS greatly influence prevalence estimates. In this journal, Keshteli *et al* reported a prevalence of 21.5% in Iranian adults based on the modified Rome III criteria [10]. However, the prevalence in Iran was only 9.0% (95% CI, 6.0-13.0) based on the Rome II criteria [9]. Moreover, IBS prevalence differs among Western countries even when the same diagnostic criteria are used. For example, France has a lower IBS prevalence than America. From this meta-analysis by Lovell and Ford [9], IBS-D was the most prevalent (40.0%), followed by IBS-C (35.0%) and IBS-M (23.0%).

IBS is frequently seen in adolescents. According to Lovell and Ford's meta-analysis [9], its prevalence appears to decline modestly with increasing age. While individuals aged 50 years or older do have a lower odds ratio for IBS than those younger than 50, the prevalence of IBS was reported to be almost the same in adolescents as in adults [11-13]. Indeed, in our data [11], the prevalence in students aged 15 years was 14.6% in 2004 and 19% in 2009, with girls showing higher prevalence than boys in both years. Students with IBS exhibited lower health-related quality of life and lower self-efficacy, and reported more sleep disturbance, traumatic episodes, and perceived stress than students without abdominal symptoms. Students with IBS also had alexithymic tendencies, which worsened symptoms. These features are also seen in adult IBS. Further studies are needed to determine whether these features are causes or consequences of IBS.

Some subjects with acute infectious gastroenteritis develop a subtype of IBS termed post-infectious IBS (PI-IBS). In a meta-analysis, Halvorson *et al* reported a PI-IBS prevalence of 9.8% (odds ratio, 7.3) [14]. Thabane *et al* reported that the odds ratio of PI-IBS was 5.86 and that its prevalence decreased with increasing years after acute gastroenteritis [15]. It is thought that the risk of developing PI-IBS is high within a few years after gastroenteritis. While these reports analyzed only bacterial gastroenteritis, high prevalence of PI-IBS after viral gastroenteritis has also been reported [16]. PI-IBS accounts for about 5-25% of all IBS cases [17,18]. In our data from a survey of patients during routine medical examinations, the ratio of past gastroenteritis was 16.1% in controls, 32.6% in IBS non-consulters, and 44.6% in IBS patients [6]. There is now little doubt that infectious gastroenteritis is one of the risk factors for developing IBS.

Taken together, epidemiological features of IBS are affected by many factors including diagnostic criteria, age, sex/gender, and post-infectious episodes. Moreover, culture likely plays an important role in the features of IBS. There are some remaining challenges in establishing an accurate epidemiology of IBS, but doing so will provide a key to treating this common syndrome around the world.

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