



Socioeconomic Disparities: A Possible Clue to a Puzzle Encompassing Organic to Functional Gastrointestinal Disorders

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Article: The conundrum of obesity and gastroparesis hospitalizations: a retrospective comparative analysis of hospitalization characteristics and disparities amongst socioeconomic and racial backgrounds in the United States
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Diverse etiologies involving abnormal gastric motility, gut sensitivity, mucosal inflammation, and various cell changes have been suggested as the pathophysiology of gastroparesis.¹ However, gastroparesis lies between functional and organic diseases because its mechanism is not clearly known. In this issue, Dahiya et al² analyzed the relationship between obesity and gastroparesis hospitalizations in the United States using socioeconomic and racial differences. They found that gastroparesis hospitalizations of obese patients were associated with the female sex and black race. Gastroparesis in obese patients was associated with a longer hospitalization period, high total health costs, and high use of medical resources compared with gastroparesis in non-obese patients. What is noteworthy in their results is that lower income was associated with a higher gastroparesis hospitalization rate regardless of obesity (Figure A). Interestingly, we were able to obtain similar results by re-analyzing the data of a study investigating the incidence of peptic ulcer bleeding between 2006 and 2015 using the Korean National Health Insurance Service Database (Figure B).³

To unveil the pathophysiology of diseases, including functional

gastrointestinal disorders (FGIDs) and gastroparesis, various factors that can affect the prevalence and disease course have been analyzed. Depression or anxiety has been commonly evaluated in studies on FGIDs.⁴ Recently, sex has been recognized as a biological variable and is recommended to be analyzed in all biomedical research.⁵ However, the effect of socioeconomic factors has not been routinely investigated. There are only a few studies on the impact of socioeconomic factors on gastroparesis. Low household income is related to gastroparesis, and idiopathic gastroparesis is associated with higher income than diabetic gastroparesis.^{6,7} A recent population study reported that low household income was associated with the highest mortality rate.⁸

The effect of socioeconomic factors has been studied slightly more in FGIDs than in gastroparesis, so we reviewed it briefly. A large-scale study analyzing 5430 United States households through a survey reported that the lower the household income, the higher the frequency of FGIDs and the severer symptoms.⁹ Another population-based study reported that low socioeconomic status was a risk factor that increased the prevalence of both upper and lower

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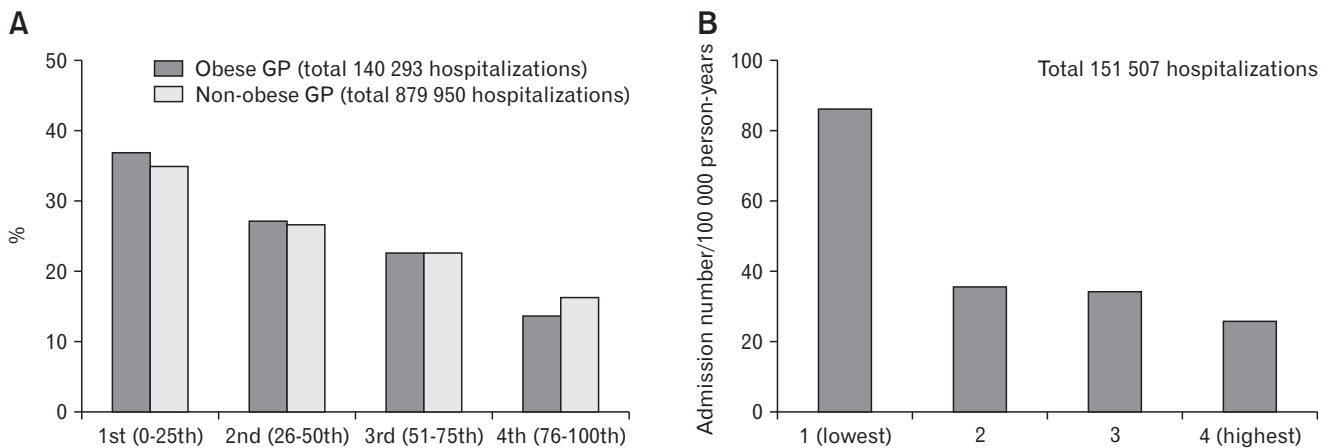


Figure. The effect of socioeconomic factors is similar across diseases and countries. (A) Distribution of obese and non-obese gastroparensis (GP) hospitalized patients according to household income in the United States. (B) The admission rate for peptic ulcer bleeding according to health insurance holders' income in Korea.

FGIDs.¹⁰ However, there was still a lack of research on the effect of socioeconomic factors on FGIDs. For example, in a meta-analysis of 80 studies to identify the global prevalence and risk factors of irritable bowel syndrome (IBS), only 4 studies analyzed the prevalence of IBS according to socioeconomic factors.¹¹ There was no significant difference in the prevalence of IBS according to socioeconomic status, however, it was difficult to draw clear conclusions due to the small number of studies and their heterogeneity.¹¹ Interestingly, 1 of those 4 studies showed that the risk of IBS is higher among high-income men through a sex difference analysis.¹² This suggests that more data and detailed analyses are needed because contributing factors such as socioeconomic factors and sex are intertwined. In addition, the impact of socioeconomic factors on IBS prevalence may vary depending on the country or culture.

Despite the importance of socioeconomic factors in clinical studies, there are several obstacles to analyzing them. First, researchers are less interested in the relationship between socioeconomic factors and the disease. Many studies have collected data about the demographic and socioeconomic features, but only marital status and education level were analyzed, or income was only used to correct other data.¹³ It is even unclear how the socioeconomic class of subjects was classified in some studies.¹⁴

Second, it is difficult to obtain reliable data that can accurately reflect the socioeconomic factors of subjects. In face-to-face or questionnaire surveys, there is a tendency not to answer questions about economic status or not to answer them accurately. Therefore, many researchers evaluate socioeconomic factors using indirect data such as the average risk of deprivation in the area of residence, the living house type, or educational level.^{15,16} However, these variables do

not represent the exact personal economic status. In our study, the Korean National Health Insurance Service Database classified the income quintile at the household insurance holder level according to the insurance premiums paid; therefore, the socioeconomic factors for each household could be categorized relatively accurately.³

Then, what is a plausible explanation for the mechanism by which socioeconomic factors affect the pathophysiology of FGIDs? Psychological comorbidities associated with low socioeconomic factors can be considered. It is well known that depression and anxiety are prevalent in patients with FGIDs,⁴ and low socioeconomic factors are a risk factor related to high anxiety.¹⁷ Low socioeconomic factors may have a physiological impact on patients with FGIDs. In particular, the hypothesis that early-life social qualifications impact adult physiology has been raised.¹⁸ A study with blood-derived genome-wide transcriptional profiles demonstrated that socioeconomic factors in childhood were associated with continuing up-regulation of the inflammatory transcriptome in adulthood.¹⁹ These changes persisted independently of socioeconomic experiences in adulthood.¹⁸ It can also be presumed that racial differences may be related to socioeconomic factors in a multiracial country. Dahiya et al² showed a relationship between gastroparensis in obese patients and the black race, suggesting that these 2 factors may be connected by socioeconomic status.

Finding and analyzing additional variables is a difficult and complex process, but this will be an opportunity to find answers and obtain new insights to solve the puzzle of intractable diseases such as FGIDs and gastroparensis. The Rome Foundation surveyed the worldwide prevalence and burden in 2021 and confirmed the relationship between several variables and FGIDs through question-

naires. However, analyzing the effect of socioeconomic factors on the incidence of FGIDs was proposed as a future task.¹⁹

In conclusion, future studies on FGIDs should try to find the effects of socioeconomic factors on the prevalence, disease course, and treatment outcome of intractable diseases. Clinicians could get better treatment results than now if new insights based on socioeconomic factors are applied to determine the treatment strategy.²⁰

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