



Changes in Metabolic Parameters by *Helicobacter pylori* Eradication According to Sex Differences

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See "Long-term Effects of the Eradication of *Helicobacter pylori* on Metabolic Parameters, Depending on Sex, in South Korea" by Jaehyung Park, et al. on page 58, Vol. 17, No. 1, 2023

Helicobacter pylori is a unique bacterium that has an obvious etiological role in various gastrointestinal diseases, including gastritis, peptic ulcer, gastric mucosa-associated lymphoid-tissue lymphoma, and gastric cancer, through chronic inflammation. Researchers have investigated whether the chronic inflammation induced by *H. pylori* infection can lead to diseases other than those of the stomach in humans, and interest in these fields has increased. Since the mid-1990s, many studies have been published on the association between *H. pylori* infection and extragastric disorders, including hematologic, cardiovascular, neurodegenerative, autoimmune, allergic, dermatologic, and metabolic diseases.¹

Metabolic syndrome (MS) is a cluster of metabolic abnormalities that increases the risk of developing diabetes and cardiovascular or cerebrovascular diseases.² The diagnostic criteria for MS include hypertension, hyperglycemia, dyslipidemia, and central obesity.² All these are essential metabolic parameters, among them, the possibility of an association between *H. pylori* infection and dyslipidemia has been steadily raised. This could be because MS and dyslipidemia are presumed to be caused by chronic low-grade systemic inflammation, and *H. pylori* has been shown to exacerbate chronic inflammation in the host. A multicenter nationwide study from Korea (n=15,195) revealed that *H. pylori* infection is positively related to body mass index (BMI), total cholesterol, and low-density lipoprotein (LDL) cholesterol, and negatively associated with high-density lipoprotein (HDL) cholesterol.³ A meta-analysis that included 27 studies from around the world also reported that *H. pylori*-positive participants had higher

levels of LDL cholesterol, triglyceride, and total cholesterol and lower levels of HDL cholesterol in their blood than *H. pylori*-negative participants.⁴ However, several studies have failed to demonstrate the association between *H. pylori* infection and deranged metabolic parameters.⁵

Investigating changes in metabolic parameters after *H. pylori* eradication can also determine the effect of *H. pylori* infection on MS and dyslipidemia. In that regard, Park *et al.*⁶ reported in an issue of *Gut and Liver* that *H. pylori* eradication-related alteration in metabolic parameters varied by sex. This prospective observational study divided the participants into three groups based on their *H. pylori* status: *H. pylori*-uninfected (n=509), *H. pylori*-non-eradicated (n=346), and *H. pylori*-eradicated (n=666). Metabolic parameters were measured in each group after *H. pylori* eradication therapy. The follow-up period was 5 years, and sex-specific analyses were conducted. When the results were analyzed without taking sex into account, the HDL cholesterol levels and BMI, among various parameters, were found to have increased 1 year after *H. pylori* eradication therapy; however, no significant differences were observed at 3 and 5 years. Regarding sex-based differences, HDL cholesterol increased in females (p=0.023), and BMI increased in males (p=0.010) after the *H. pylori* eradication therapy. However, after propensity score matching, HDL cholesterol was found to have significantly increased in females (p=0.006), and BMI tended to increase in males (p=0.089) in the first year of follow-up.

Several studies have investigated the effect of *H. pylori* eradication on MS and dyslipidemia; however, the results remain controversial. A Korean prospective cohort study



(n=13,383) showed that successful *H. pylori* eradication reduced the risk of developing high LDL cholesterol and low HDL cholesterol levels.⁷ In addition, a recent meta-analysis evaluating 24 studies reported that *H. pylori* eradication increased HDL cholesterol levels; however, triglyceride levels also increased after *H. pylori* eradication.⁸ Few studies have examined the long-term effect of *H. pylori* eradication on MS and dyslipidemia, and even fewer have evaluated the variations by sex. Only two of the 24 studies included in the meta-analysis had a follow-up of more than 1 year.⁸

Although the effect of *H. pylori* eradication on MS and dyslipidemia has not been investigated, a retrospective study from Korea reported that *H. pylori* infection is associated with increased total cholesterol in males and decreased HDL cholesterol in females.⁹ A recent Korean retrospective cohort study demonstrated that successful *H. pylori* eradication reduced the risk of developing low HDL cholesterol in females and high LDL cholesterol in males.¹⁰ The baseline BMI differed between *H. pylori*-persistent and *H. pylori*-eradicated groups, but sex-specific subgroup analysis for BMI was not performed.¹⁰

This study had several limitations. Firstly, the terms *H. pylori*-negative status and *H. pylori*-uninfected status were used interchangeably. In clinical practice, it is challenging to prove *H. pylori*-negativity; however, *H. pylori*-negative and *H. pylori*-uninfected can be different. Second, patients with hypertension, dyslipidemia, and type 2 diabetes mellitus, as well as patients taking medications such as lipid-lowering agents, were included, which may have affected the study results. In addition, this study showed that *H. pylori* eradication affected MS and metabolic parameters differently by sex, but the mechanism by which these effects occur is still unknown. Nonetheless, this study is valuable since no other study has followed up a large number of patients over 5 years to establish the association between *H. pylori* eradication and MS and metabolic parameters by sex. However, further well-designed prospective studies are required to determine the influence of *H. pylori* infection and its eradication on metabolic parameters and diseases, including MS.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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