

## Prevalence of *Helicobacter pylori* Infection in Patients with Chronic Kidney Disease

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See “*Helicobacter pylori* Infection in Patients with Chronic Kidney Disease: A Systematic Review and Meta-Analysis” by Suk Pyo Shin, et al. on page 628, Vol. 13, No. 6, 2019

There have been some debates about the association of *Helicobacter pylori* infection and chronic kidney disease (CKD). Pathogenesis of *H. pylori* infection in patients with CKD is not clearly revealed and there are not enough studies about these two factors. There are several hypothesis which support that kidney disease may reduce *H. pylori* infection. High level of serum urea nitrogen can contribute to a decreased gastric acid secretion and higher gastric pH which could be the cause of lower prevalence of *H. pylori* among CKD.<sup>1</sup> Inflammatory cytokines are also increased in CKD patients and it can cause gastric mucosal damage, chronic gastritis, and spontaneously eradicate *H. pylori*.<sup>2</sup> In addition, antibiotics, proton pump inhibitors, or H<sub>2</sub> receptor antagonists which are used in patients with CKD for long time might be associated with decreased *H. pylori* infection.<sup>3</sup>

There are other hypothesis that are contrary to above theories. Some studies showed that high urea concentration makes the gastric mucosa more susceptible to *H. pylori* and infection rate is higher in uremic patients.<sup>4,5</sup> And, in some articles which have studied about peptic ulcer in CKD, the prevalence of *H. pylori* infection looked lower compare to ulcer in non-CKD patients but real incidence may not be lower.<sup>6</sup> Because the incidence of peptic ulcer is higher in CKD patients with various causes except *H. pylori* infection.<sup>7</sup>

In nationwide study of Taiwan, *H. pylori* infection rate is lower in peptic ulcer disease patients with CKD and end-stage renal disease (ESRD) than in those without CKD.<sup>6</sup> On the contrary, recent meta-analysis studies showed no relation between *H. pylori* infection and CKD nor ESRD.<sup>8,9</sup> However, those previous meta-analysis about the association between *H. pylori* infection and

kidney disease have some selection biases. In this research,<sup>10</sup> authors tried to minimize bias of previous meta-analyses and showed the results about the prevalence of *H. pylori* infection in patients with CKD.

In this issue of *Gut and Liver*, Shin *et al.*<sup>10</sup> included many articles compared to previous studies using systematic reviews and narrowed inclusion criteria to increase the accuracy of the results. Studies with only CKD patients were enrolled and other studies which have vague inclusion criteria including renal transplant recipients, diabetic nephropathy, or pediatric population were excluded. Authors compared the prevalence of *H. pylori* infection between CKD patients and control first, then showed subgroup analyses according to the modifiers.

In the 47 case-control or cross-sectional studies, CKD patients were 4,084 and controls without CKD were 6,908, and total prevalence of *H. pylori* infection in CKD patients was 48.2% and in controls was 59.3%. Pooled analysis using 34 studies with same study design and statistical models supported significantly lower rate of *H. pylori* infection in CKD patients (odd ratio, 0.64; 95% confidential interval, 0.52 to 0.79).

This meta-analysis<sup>10</sup> showed lower infection rate of *H. pylori* in CKD patient with or without dialysis compare to non-CKD patients. Based on this research, there are some interesting points and further considerations. In this study, subgroup analysis showed the different results according to the methodological quality of included studies and significantly lower prevalence rate of *H. pylori* infection in CKD patients compare to controls was revealed in high qualified studies. In previous study which reported negative association of *H. pylori* with CKD,<sup>8</sup> author showed trend of decreased risk of *H. pylori* infection in patients

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with CKD in subgroup which had lower heterogeneity. These factors can be thought that, if studies can be focused to the adult CKD patients without renal transplant recipient or diabetes mellitus nephropathy, the prevalence of *H. pylori* infection may be clearly lower in CKD patients. This kind of clear result could pave the way for researchers to focus on the next step such as to clarify the reason of decreasing *H. pylori* infection in CKD patients.

This study, which was performed using statistical techniques of great effort, has important clinical meaning because authors found that *H. pylori* infection rate is lower in CKD patients compare to non-CKD patients. And they gave a message of importance about the well-designed study. Based on these results, further studies are expected to clearly the association between *H. pylori* and renal function and finally to contribute reducing the *H. pylori* infection.

### CONFLICTS OF INTEREST

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

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