The association between *Helicobacter pylori* eradication in peptic ulcer patients and gastric cancer? Investigation in an East-Asian population

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Dear Editor;

*Helicobacter pylori* (*H. pylori*) is one of the main cause of gastric adenocarcinoma particularly non-cardia cancer (1). There are several evidence that *H. pylori* can develop to gastric cancer via induction of inflammatory response, chronic gastric atrophy, intestinal metaplasia, and dysplasia; IARC/WHO in 1994 has been declared that *H. pylori* is classified as class I carcinogen in humans (2-3). In previous reports on Mongolian gerbils model has been defined that eradication of *H. pylori* can significantly reduce the risk of gastric cancer (4). The clinically efficacy of *H. pylori* eradication in reduction of gastric cancer in human is controversial (5-6); however, there are several published meta-analysis studies has been suggested that eradication of *H. pylori* infection is benefit in prevention of gastric cancer development in asymptomatic cases and patients with history of endoscopic resection surgery (7-8). For the first time, we analyzed all available document in relation to evaluation of gastric cancer risk after *H. pylori* eradication in patients with peptic ulcer in a East-Asia population.

A systematic search of literature was conducted via PubMed, Scopus, Embase, Google scholar, and Cochrane Library databases without limitation in publication date or language due November 2020. We searched documents by keywords according to the MeSH terms including “*Helicobacter pylori*”, “*H. pylori*”, “eradication”, “peptic ulcer”, and “gastric cancer” to collected all available documents. The inclusion criteria were: 1) clinical trials, cohort studies on evaluation efficacy of *H. pylori* eradication in patients with peptic ulcer in prevention of gastric cancer development, 2) studies that evaluated incidence of gastric cancer in both *H. pylori* eradication group and *H. pylori* persistent infection, 3) studies on East-Asian population. However, 1) review, case-reports, congress abstracts, 2) duplicates, 3) studies on non-human samples, and 4) studies with insufficient data were excluded as exclusion criteria.

We pooled the data using Comprehensive Meta-Analysis (CMA) software version 2.2 (Biostat, Englewood, NJ, USA). The incidence of gastric cancer in each groups were expressed as percentage with 95% confidence intervals (95% CIs); in addition, the relationship between *H. pylori* eradication and development of gastric cancer was measured by odds ratio (OR) with 95% CIs. Heterogeneity in studies was assessed via I² index and Cochrane Q test. The random effects-models has been applied in case of heterogeneity (I² >25% and Cochrane Q p-Value> 0.05) (9).

We collected 1,502 reports after comprehensive literature search throughout databases. However; only 5 studies were met our inclusion criteria that entered to the statistical analysis (10-14). The studies were conducted between 2005-2015. 4 studies from Japanese ethnicity and 1 study from Taiwanese popu-

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Brief Report
lation. We extracted the required data consisting
1) first author, 2) Country, 3) Year, 4) Follow-up
period, 5) incidence of gastric cancer in H. pylori
eradicated and untreated patients with history
of peptic ulcer, and 6) references number in the
Table 1.

We enrolled data of the 86,818 patients
with history of peptic ulcer which subdivided
in two groups of H. pylori eradicated and uneradi-
cated.

The incidence of gastric cancer in the
H. pylori eradicated patients and uneradicted cases
were 1% (0.8-1.2 with 95% CIs; p-Value: 0.001;
I2: 88.44; Q-Value: 34.61; p-Value: 0.01; Egger’s
p-Value: 0.46) and 1.6%
(1.2-2.1 with 95% CIs; p-Value: 0.01; I2: 79.36;
Q-Value: 19.38; p-Value: 0.01; Egger’s p-Value:
0.20; Begg’s p-Value: 0.11) respectively. The cur-
rent analysis reveal that there are inverse associa-
tion between H. pylori eradication in patients with
peptic ulcer and risk of develop to gastric cancer
(OR: 0.47; 0.33-0.67 with 95% CIs; p-Value: 0.01;
I2: 0.00; Q-Value: 2.45; p-Value: 0.65; Egger’s
p-Value: 0.15; Begg’s p-Value: 0.33); therefore,
eradication of H. pylori infection can reduce risk
of gastric cancer development in patients with his-
tory of peptic ulcer (Figure 1).

H. pylori is Gram-negative, microaero-
philic, and motile bacteria which colonized in hu-
man stomach of nearly 50% of world population;
there are several evidence for chronic coloniza-
tion with H. pylori that significantly increased the
risk of gastric cancer development (15). Eradica-
tion of H. pylori infection can have reduced the
risk of gastric cancer as well as reduction of
H. pylori in young population as reservoir of infec-
tion (5, 10). According to literatures, the mother to
child transmission is predominant rout of H. pylori
transmission in Japanese population; therefore,
eradication of H. pylori infection can be consid-
ered as appropriated strategy for reducing both of
gastric cancer as well as H. pylori infection burden
(16). There are several literatures in relation to ef-
cicacy of H. pylori eradication for prevention of

Table 1. Characteristics of included studies.

<table>
<thead>
<tr>
<th>First author</th>
<th>Country</th>
<th>Year</th>
<th>Follow-up period</th>
<th>GC incidence successful eradication</th>
<th>treatment failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take et al.,</td>
<td>Japan</td>
<td>2005</td>
<td>1 years</td>
<td>8/944</td>
<td>4/176</td>
</tr>
<tr>
<td>Take et al.,</td>
<td>Japan</td>
<td>2007</td>
<td>9.5 years</td>
<td>9/953</td>
<td>4/178</td>
</tr>
<tr>
<td>Mabe et al.,</td>
<td>Japan</td>
<td>2009</td>
<td>5.6 years</td>
<td>32/2451</td>
<td>11/639</td>
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<tr>
<td>Wu et al.,</td>
<td>Taiwan</td>
<td>2009</td>
<td>8.5 years</td>
<td>19/54576</td>
<td>23/25679</td>
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<tr>
<td>Take et al.,</td>
<td>Japan</td>
<td>2015</td>
<td>1 years</td>
<td>21/1030</td>
<td>9/192</td>
</tr>
</tbody>
</table>

Figure 1. The clinical benefit of H. pylori eradication and risk of develop to gastric cancer in patients with
history of peptic ulcer.
H. pylori eradication in PUD and gastric cancer risk

gastrectomy development in asymptomatic carrier and patients with endoscopic resections (7, 8); however, we evaluated the efficacy of H. pylori eradication in reduction of gastric cancer in patients with history of peptic ulcer. We are suggested that H. pylori infection should be eradicated in peptic ulcer patients in order to reducing the risk of develop to gastric cancer.

Conflict of Interest
None declared.

References
