Brief Report

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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 develop to gastric cancer was measured by odds ratio (OR) with 95% CIs. Heterogeniety 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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Table 1. Characteristics of included studies.

First author	Country	Year	Follow-up period	GC incidence		Ref
				successful eradication	treatment failure	
Take *et al*.,	Japan	2005	1 years	8/944	4/176	10
Take *et al*.,	Japan	2007	9.5 years	9/953	4/178	11
Mabe *et al*.,	Japan	2009	5.6 years	32/2451	11/639	12
Wu *et al*.,	Taiwan	2009	8.5 years	19/54576	23/25679	13
Take *et al*.,	Japan	2015	1 years	21/ 1030	9/ 192	14

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 uneradicated.

The incidence of gastric cancer in the *H. pylori* eradicated patients and uncured 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: 0.34; Begg's p-Value: 0.46) and 1.6% (1.2-2.1 with 95% CIs; p-Value: 0.01; I2: 79.36; Q-Vlue: 19.38; p-Value: 0.01; Egge's p-Value: 0.20; Begg's p-Value: 0.11) respectively. The current analysis reveal that there are inverse association 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 history of peptic ulcer (Figure 1).

H. pylori is Gram-negative, microaerophilic, and motile bacteria which colonized in human stomach of nearly 50% of world population; there are several evidence for chronic colonization with *H. pylori* that significantly increased the risk of gastric cancer development (15). Eradication 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 infection (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 considered as appropriated strategy for reducing both of gastric cancer as well as *H. pylori* infection burden (16). There are several literatures in relation to efficacy of *H. pylori* eradication for prevention of

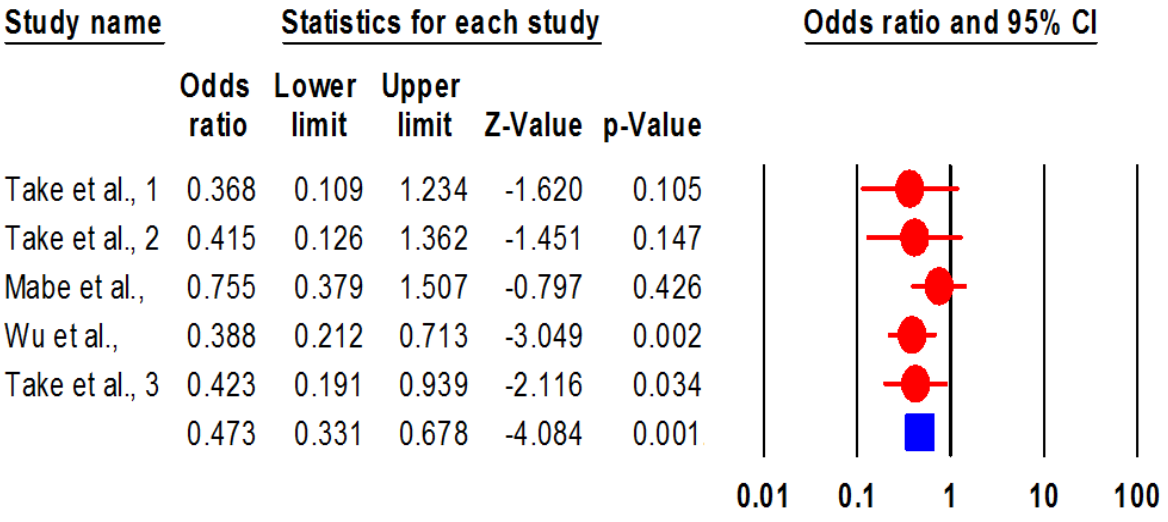

Figure 1. The clinical benefit of *H. pylori* eradication and risk of develop to gastric cancer in patients with history of peptic ulcer.

gastric cancer 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.

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