Chen and his team published their study, which was mainly about the relationship between the gut microbiota and liver immunity against HBV, in the Proceedings of the National Academy of Sciences of the United States of America (PNAS).

In this study, mice were transfected with HBV and studied. Adult mice (12 weeks old) cleared HBV within 6 weeks after transfection, while their young counterparts (6 weeks old) remained HBV-positive 26 weeks after transfection. In addition, antibiotic-induced sterilization of the gut microbiota at a young age prevented adult mice from rapidly clearing HBV. Possible molecular mechanisms of clearing HBV were elucidated by using mice with specific gene mutations.

Based on the above results, gut microbiota development may be associated with age-dependent HBV clearance. This relationship may guide new treatments aimed at helping neonates eradicate HBV.

Reference

Han-Hsuan Chou, Wei-Hung Chien, Li-Ling Wu, Chi-Hung Cheng, Chen-Han Chung, Jau-Haw Horng, Yen-Hsuan Ni, Hong-Tai Tseng, Dafei Wu, Xuemei Lu, Hurng-Yi Wang, Pei-Jer Chen, and Ding-Shinn Chen. (2015). Age-related immune clearance of hepatitis B virus infection requires the establishment of gut microbiota. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*, 112(7), 2175-2180; published ahead of print February 2, 2015. DOI:10.1073/pnas.1424775112

Professor Hurng-Yi Wang
Graduate Institute of Clinical Medicine, College of Medicine
Institute of Ecology and Evolutionary Biology
hurngyi@ntu.edu.tw

Professor Pei-Jer Chen
Graduate Institute of Clinical Medicine, College of Medicine
Hepatitis Research Center, National Taiwan University Hospital
peijerchen@ntu.edu.tw

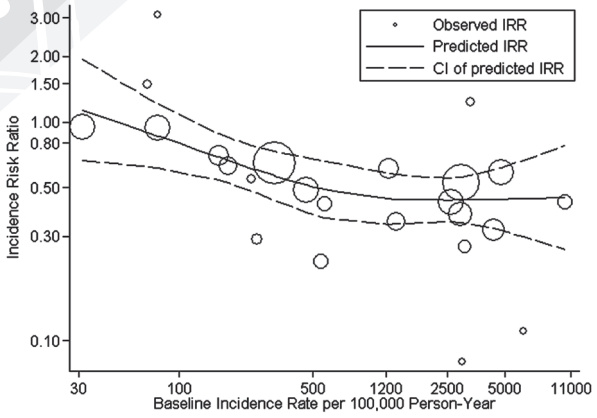
Professor Ding-Shinn Chen
Department of Internal Medicine, College of Medicine
Hepatitis Research Center, National Taiwan University Hospital
chends@ntu.edu.tw

Helicobacter pylori eradication reduces the risk of gastric cancer

Gastric cancer is a major global health threat and is the third-leading cause of cancer deaths worldwide, as the disease causes more than 720,000 deaths per year globally. Gastric cancer detection during a symptomatic stage often results in poor survival and frequent recurrence despite the availability of various modalities that can be used as rescue treatments. As the size of the elderly population is continuously increasing, the International Agency for Research on Cancer has estimated that the current high incidence rate of gastric cancer will remain stable or even increase by 2030 without the development of effective measures for preventing the disease.

Helicobacter pylori is the most important etiologic factor for gastric cancer. It is estimated that 89% of non-cardiac gastric cancers, which account for 78% of gastric cancer cases, are attributable to *H. pylori* infection. Since *H. pylori* can be eradicated with a short-course of antibiotic treatment, identifying and eradicating *H. pylori* infection may represent an effective strategy for reducing the risk of gastric cancer.

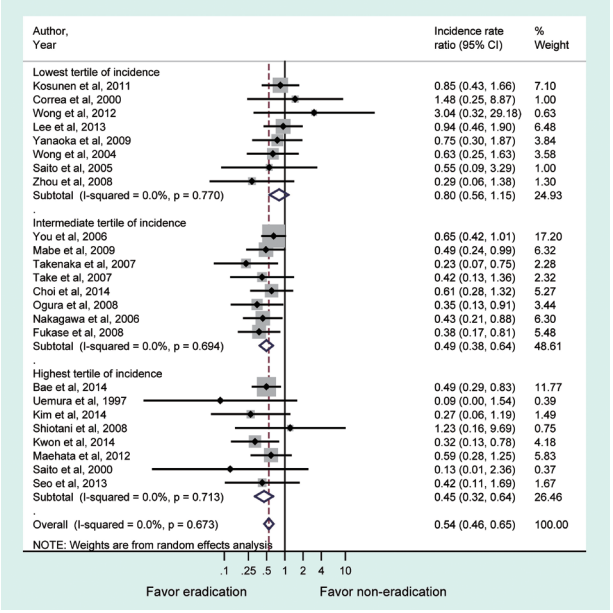
However, in real-life settings, the magnitude of the benefit of *H. pylori* eradication with respect to the risk of subsequent gastric cancer development remains unclear. To address this important question, researchers from the Department of Internal Medicine and the Institute of Epidemiology and Preventive Medicine of National Taiwan University and Baylor College of Medicine in Houston, Texas, USA, have conducted a systematic review and me-



ta-analysis of randomized trials and cohort studies involving both asymptomatic *H. pylori* carriers (i.e., primary prevention) and individuals undergoing endoscopic resection of early gastric cancer (i.e., tertiary prevention) to investigate the association between *H. pylori* eradication and gastric cancer incidence. The study was published in the May 2016 issue of Gastroenterology.

From a total of 8,061 articles, 24 eligible studies (from China, Colombia, Finland, Japan, Korea, and Taiwan) including a total of 48,064 individuals/340,255 person-years and 715 incident gastric cancers were included in the analysis. Gastric cancer developed in 253 of 20,484 infected individuals who received eradication therapy compared with 462 of 27,580 infected individuals who did not receive anti-*H pylori* treatment; thus, eradication therapy yielded a risk reduction of 46% (95% confidence interval: 35% to 54%), and no significant heterogeneity was noted between studies. The benefits of *H. pylori* eradication did not differ according to study design, sex, or follow-up period.

The baseline gastric cancer incidence in each study varied widely from 34.3 to 10,256.4 cases per 100,000 person-years. Researchers also identified a non-linear correlation between baseline gastric cancer incidence and the incidence rate ratio. The upper 95% CI of the incidence rate ratio for eradication decreased to below 1 when the baseline gastric cancer incidence exceeded 150 cases per 100,000 person-years, and the incidence rate ratio continued to decrease concurrently with increasing baseline incidence up to approximately 1,200 cases per 100,000 person-years and then stabilized. These findings indicate that studies on high-risk individuals have superior statistical power and that studies involving low-to-intermediate risk groups have been constrained by insufficient sample sizes



and short follow-up periods.

In conclusion, "*by synthesizing available evidence from multiple populations and clinical scenarios, our study shows that H. pylori eradication reduces gastric cancer risk in all risk groups,*" the authors wrote in an interview with Reuters. The purpose of *H. pylori* eradication is to resolve gastric inflammation, halt gastric mucosal damage progression, prevent further *H. pylori*-induced DNA damage, improve gastric acid secretion, and restore the microbiome to normal. This study provides strong clinical support for the use of a mass eradication program to reduce the enormous disease burden of gastric cancer globally.

Reference

Yi-Chia Lee, Tsung-Hsien Chiang, Chu-Kuang Chou, Yu-Kang Tu, Wei-Chih Liao, Ming-Shiang Wu, David Y Graham. (2016) Association Between *Helicobacter pylori* Eradication and Gastric Cancer Incidence: A Systematic Review and Meta-analysis. *Gastroenterology*, 150(5), 1113-1124.e5. DOI: 10.1053/j.gastro.2016.01.028.

Clinical Professor Yi-Chia Lee
Department of Internal Medicine
yichialee@ntu.edu.tw

Professor Ming-Shiang Wu
Department of Internal Medicine
mingshiang@ntu.edu.tw