HHS Public Access

Author manuscript

Clin Gastroenterol Hepatol. Author manuscript; available in PMC 2022 September 01.

Published in final edited form as:

Clin Gastroenterol Hepatol. 2021 September ; 19(9): 1990–1991. doi:10.1016/j.cgh.2020.10.041.

Screening for gastric cancer: focus on the ants instead of the ant hill

Mimi C. Tan, M.D., M.P.H[1,2], **David Y. Graham, M.D.**[1,2]

[1]Section of Gastroenterology and Hepatology, Department of Medicine, Baylor College of Medicine, Houston, TX, USA

[2]Department of Medicine, Michael E. DeBakey VA Medical Center, Houston, TX, USA

Keywords

Helicobacter pylori ; gastric cancer; screening; cancer risk

Dear Editor,

The report by Shah et al.[1] regarding the cost effectiveness of screening for gastric cancer in Asian Americans is the most recent iteration of cost effectiveness mathematical models for endoscopy-based cancer screening. They performed a decision-analytic Markov model and reported that a one-time upper endoscopy at age 50 (bundled with colonoscopy for colon cancer screening) with biennial upper endoscopy for those with precancerous lesions (i.e., gastric intestinal metaplasia) was a cost effective strategy for gastric cancer screening in Asian Americans. Previous studies found that one-time upper endoscopy at age 50 in the general U.S. population was not cost effective[2] ($115,664 per quality-adjusted life year [QALY]) but was cost effective among Blacks ($80,278/QALY), Hispanics ($76,070/QALY), and Asians ($71,451/QALY) specifically[3]. One issue with the Shah et al. study is the probability estimates used for the Markov model (e.g., 35–40% probability of gastric intestinal metaplasia among the 3 high-risk races). These probability estimates were from pathology databases which consisted of patients referred for upper endoscopy with gastric biopsies and likely do not represent true probability of precancerous lesions among asymptomatic screening populations.

While one might quibble with details of the estimates used by Shah et al., the fundamental issue is the screening approach to gastric cancer prevention. The screening approach for cancers in which the direct cause is unknown, such as colon cancer, is not directly applicable to cancers whose cause is known and treatable. For example, both viral hepatitis-associated liver cancer and *Helicobacter pylori*-associated gastric cancer are inflammation-associated

Address correspondence to: Mimi C. Tan, MD, MPH, Baylor College of Medicine, One Baylor Plaza, MS: BCM 285, Houston, TX 77030-3498, mc2@bcm.edu.

cancers for which the carcinogenic process can be stopped and the cancer risk mitigated by cure of the infection[4]. In the setting of *H. pylori* gastritis, the rate of cancer risk progression is initially slow followed by an exponential increase corresponding to increasing extent and severity of atrophic gastritis. Cure of *H. pylori* infection halts and may partially reverse this process. Shah et al. begin their evaluation at age 50 which corresponds with the age of initial screening colonoscopy. However, by age 50 the average *H. pylori* patient has already entered the stage of exponential rise in gastric cancer risk; starting screening at age 50 would blunt the overall benefits of cancer screening and would ensure a steady population to screen.

Until recently, the goal of endoscopy-based gastric cancer screening in Japan was to identify gastric cancers at an early stage where death from cancer could be reduced (secondary prevention)[5]. The pendulum is now swinging to primary prevention through *H. pylori* testing and cure. Both the Houston Consensus Conference on testing for *H. pylori* infection in the United States[6] and the Taipei Global Consensus on screening and eradication of *H. pylori* for gastric cancer prevention[7] stress *H. pylori* eradication as the primary focus for gastric cancer prevention. The Houston Consensus recommends testing all high-risk groups, such as first-generation immigrants from high prevalence areas as well as Latino and African American racial or ethnic groups. Following the lead of the Kyoto Consensus, the Taipei Global Consensus states that *H. pylori* screening of young adults from high-risk regions would be the most cost effective strategy at a population level and emphasizes that eradication therapy should be given as early as possible in adults before the development of gastric precancerous lesions. These recommendations have recently been proven effective by the population-wide *H. pylori* screen and treat experience among the Taiwanese on Matsu Islands that resulted in a 53% reduced incidence of gastric cancer[8].

Clearly, if one wishes to reduce the gastric cancer incidence in various high-risk groups or in the entire population, a non-invasive test for *H. pylori* followed by confirmed *H. pylori* eradication is the most clinically effective and cost effective approach. While endoscopic screening may temporarily result in earlier detection of cancers and precancerous lesions in older individuals with longstanding *H. pylori* and progressive atrophy, the primary and long-term approach to gastric cancer prevention should be screening for and treating *H. pylori*, the underlying cause of the disease. We call for consistency in screening for inflammation-associated cancers; we screen high-risk groups for viral hepatitis but decline to test high-risk groups for *H. pylori*. The approach recommended by Shah et al. is like focusing on individual ants invading the kitchen rather than on the ant hill. While it may appear cost effective, it fails to address the fundamental problem and solution to gastric cancer prevention.

Acknowledgments

Support

Drs. Tan and Graham are supported in part by National Institutes of Health grant P30 DK056338 (Study Design and Clinical Research Core), which supports the Texas Medical Center Digestive Diseases Center. Dr. Tan is supported in part by the Caroline Wiess Law Fund for Research in Molecular Medicine. Dr. Graham is supported in part by the Office of Research and Development Medical Research Service Department of Veterans Affairs.

Disclosures:

Potential conflicts

Dr. Tan reports no competing interests for this publication.

Dr. Graham is a consultant for RedHill Biopharma and Phathom Pharmaceuticals regarding novel *H. pylori* therapies. He has received research support for culture of *Helicobacter pylori* and is the PI of an international study of the use of antimycobacterial therapy for Crohn's disease.

References

1. Shah SC, Canakis A, Peek RM Jr., et al.Endoscopy for Gastric Cancer Screening is Cost Effective for Asian Americans in the United States. Clinical gastroenterology and hepatology : the official clinical practice journal of the AmericanGastroenterological Association. 2020721;S1542–3565(20)30993–9.
2. Gupta NB, Ajay;Wani Sachin B;Gaddam Srinivas;Rastogi Amit;Sharma Prateek. Endoscopy for upper GI cancer screening in the general population: a cost-utility analysis. Gastrointestinal endoscopy. 20119;74(3):610–24.e2. [PubMed: 21741639]
3. Saumoy M, Schneider Y, Shen N, et al.Cost Effectiveness of Gastric Cancer Screening According to Race and Ethnicity. Gastroenterology. 2018;155(3):648–60. [PubMed: 29778607]
4. Graham DY. Helicobacter pylori update: Gastric cancer, reliable therapy, and possible benefits. Gastroenterology. 2015;148(4):719–31. [PubMed: 25655557]
5. Asaka M, Mabe K, Matsushima R, et al.Helicobacter pylori Eradication to Eliminate Gastric Cancer: The Japanese Strategy. Gastroenterology clinics of North America. 2015;44(3):639–48. [PubMed: 26314673]
6. El-Serag HB, Kao JY, Kanwal F, et al.Houston Consensus Conference on Testing for Helicobacter pylori Infection in the United States. Clinical gastroenterology and hepatology : the official clinical practice journal of the American Gastroenterological Association. 20187;16(7):992–1002. [PubMed: 29559361]
7. Liou JM, Malfertheiner P, Lee YC, et al.Screening and eradication of Helicobacter pylori for gastric cancer prevention: the Taipei global consensus. Gut2020101. Online ahead of print.
8. Chiang TH, Chang WJ, Chen SL, et al.Mass eradication of Helicobacter pylori to reduce gastric cancer incidence and mortality: a long-term cohort study on Matsu Islands. Gut2020813. Online ahead of print.