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Time for *Helicobacter pylori* eradication

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Gastric cancer is the third leading cause of cancer death in the world with more than 1 million cases per year and almost 800 000 deaths. Approximately half of the cases occur in east Asia,[1] including Taiwan, the site of a large clinical trial presented by Jyh-Ming Liou and colleagues in *The Lancet Infectious Diseases*.[2] Because *Helicobacter pylori* in high-risk countries is the pre-eminent cause of these malignancies, *H pylori* screen-and-treat programmes have received considerable attention as a potential cost-effective approach to eliminating the gastric cancer scourge.[3] *H pylori* treatment trials support this approach, with meta-analyses indicating that screen-and-treat programmes could prevent approximately 35% of gastric adenocarcinomas[4] while simultaneously reducing transmission and the overall infection burden.

Despite this promising research, screen-and-treat programmes are few and far between, even in countries at highest risk, because of the high prevalence of infection; in some high-risk countries, almost the entire adult population older than 50 years is infected. The prospect of treating such a huge proportion of the population with multiple, relatively broad-spectrum antibiotics, when only a small percentage (<5%) will go on to get cancer,[5] is both logistically daunting and microbiologically worrisome. Because of the complexities of such programmes, in 2014, a Working Group of the International Agency for Research on Cancer simultaneously put its foot on both the gas and the brake of screen-and-treat programmes.[6] Although overall, the Working Group was enthusiastic about eliminating *H pylori*-induced cancers, major concerns were raised about whether screen-and-treat-programmes would lead to induction of antimicrobial resistance in either *H pylori* or other resident flora, and about deleterious alterations in host microbiomes that might persist after treatment. Additional concerns were raised about weight gain with *H pylori* eradication and increases in oesophageal adenocarcinoma, asthma, and other conditions. The Working Group concluded that more research needed to be done to balance risks and benefits before pushing forward with broad screening and treatment programmes.

The paper by Liou and colleagues[2] provides support, although muted, for screen-and-treat programmes. The investigators compared the effects of three treatment protocols (clarithromycin triple therapy, clarithromycin quadruple therapy, and bismuth quadruple therapy) on the gut microbiome, on antimicrobial resistance in *Escherichia coli*, and on metabolic parameters including weight. The first of these treatments, which showed the least disruption of the microbiome, is unlikely to be an effective treatment strategy in much of the world, owing to high prevalences of clarithromycin resistance.

Focusing on clarithromycin quadruple therapy and bismuth quadruple therapy, the investigators found only transient increases in antimicrobial resistance. On the other hand, they report sustained perturbation of the gut microbiome, even 1 year after treatment, as well as a small amount of weight gain, although without apparent metabolic consequences.

With this work, Liou and colleagues have made substantial inroads into understanding unintended consequences of screen-and-treat programmes. However, their results are only marginally reassuring; much more needs to be learned about the immunological, metabolic, and, particularly, microbiological consequences of *H pylori* treatment. Most importantly, the paper only scrapes the surface of antimicrobial resistance, looking at only faecal organisms and not organisms that might gain resistance to the antibiotics typically used for *H pylori* eradication (ie, metronidazole, tetracycline, and clarithromycin). In this era of rapidly increasing and life-threatening antimicrobial resistance, it is sobering to think that a macrolide—one of the few remaining alternatives for treating extremely drug-resistant typhoid[7]—might be widely used in healthy adults to prevent a disease that will only afflict a small percentage. In future studies, a metagenomic approach to resistance profiling could give more granular, actionable information on the effects of therapy on antimicrobial resistance.[8]

These remaining, hypothetical concerns, however important, need to be balanced with the incidence and lethality of gastric malignancy. For those million people who will acquire gastric cancer each year, we need to move forward cautiously but undaunted.

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Complex task to estimate immune responses to various poliovirus vaccines and vaccination schedules

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Since licensing of the first poliovirus vaccine in 1955, multiple types of live attenuated oral poliovirus vaccines (OPVs) and inactivated poliovirus vaccines (IPVs) have been tested or licensed for routine childhood vaccination schedules. IPVs have been manufactured by inactivating the three serotypes of different poliovirus seed strains, either the wild or the Sabin polioviruses, the latter of which is used for manufacturing OPVs.[1] IPVs have also been used with different routes of administration and doses, and have been given at different ages.

WHO's Strategic Advisory Group of Experts (SAGE) on immunisation provides global recommendations for routine poliovirus vaccination. However, technical advisory committees of individual countries have often recommended alternative schedules with variations in the age of administration, number of doses, and combinations with other vaccines. Therefore, there is wide variation in routine poliovirus vaccination schedules.[2] This discrepancy has led to the need for trials that test the immunogenicity of poliovirus vaccines in different combinations and using different vaccination schedules. In low-income countries, where poliovirus transmission is largely faecal–oral, it is important for children to develop both robust intestinal immunity,