Shifting bacterial communities in the stomach may influence cancer risk

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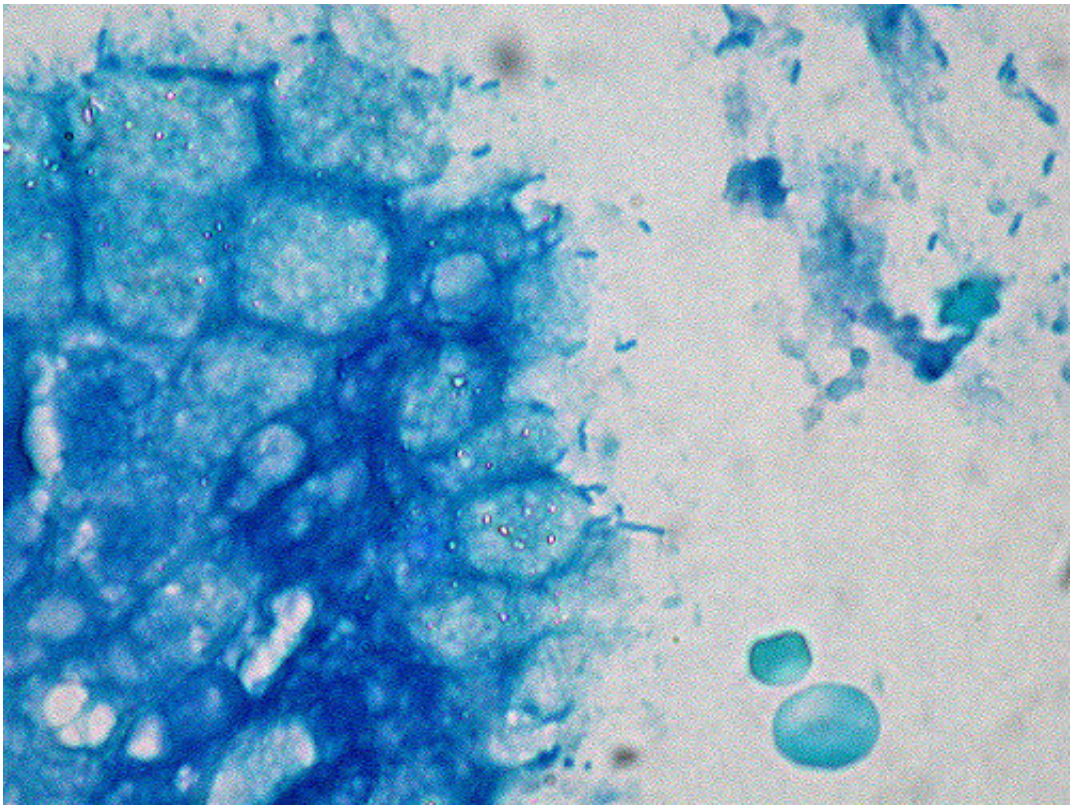

Different changes to the microbial community of the stomach may explain why related conditions are associated with different risk levels and types of gastric tumor, according to a new study in *PLOS Pathogens*. Credit: Ed Uthman via Flickr

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Autoimmune disease or infection with Helicobacter pylori bacteria can damage the stomach and reduce gastric acid secretion. Despite their similar effects, each of these conditions is associated with higher risk of a different type of gastric tumor. Meanwhile, widely used medications known as proton pump inhibitors (PPIs) also reduce gastric acid secretion, but they do not increase cancer risk.

Bryony Parsons of the University of Liverpool, U.K., and colleagues hypothesized that microbes living in the stomach could explain differences in tumor risk associated with the different causes of reduced gastric acid. Every healthy stomach is known to be home to bacterial communities, but reduced gastric acid can alter the stomach environment and cause changes in amount and type of microbes.

To investigate how changes in these microbial communities might influence tumor risk, the researchers analyzed stomach biopsies from 95 people with different conditions. They used a genetic technique known as 16S rRNA sequencing to determine which bacterial species were living in the stomachs of healthy people, people receiving PPIs, and people with reduced gastric acid secretion as a result of H. pylori infection or autoimmune disease.

They found that that people receiving PPIs had similar microbial communities in their stomachs as those seen in healthy people, despite reduced gastric acid secretion. However, people with H. pylori infection had lower amounts and fewer types of bacteria than seen in healthy people, while those with autoimmune disease had higher amounts of bacteria and equal diversity as seen in healthy people (but with different types of bacteria dominating the community).

The researchers also identified dominant biochemical processes

associated with the microbial communities seen in each type of patient. Differences in these processes and their effects on the stomach could help explain why H. pylori is more commonly associated with a cancer type known as gastric adenocarcinoma, while autoimmune disease is linked with neuroendocrine tumors.

Future research that confirms and builds on these findings could eventually lead to development of new ways to prevent cancer by manipulating the microbial community of the stomach.

My quote can be found below (and I would be grateful if you could name me in association with this quote. I would ideally like to be referred to as):

"Our work has excitingly shown that three specific conditions which all result in the stomach producing less acid cause different changes to the composition of the bacteria which live in the stomach," claims author Mark Pritchard, Professor of Gastroenterology at the University of Liverpool. "We now hope to move on to investigate how these bacteria contribute to the development of the characteristic stomach tumor types that are associated with each of these conditions."

More information: Parsons BN, Ijaz UZ, D'Amore R, Burkitt MD, Eccles R, Lenzi L, et al. (2017) Comparison of the human gastric microbiota in hypochlorhydric states arising as a result of Helicobacter pylori-induced atrophic gastritis, autoimmune atrophic gastritis and proton pump inhibitor use. *PLoS Pathog* 13(11): e1006653. doi.org/10.1371/journal.ppat.1006653

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