

Macleans.ca

Canada's only national weekly current affairs magazine.

Eradicating a bad bacteria

October 9, 2008 by Kate Lunau

The town motto of Aklavik, an Arctic hamlet huddled at the Mackenzie River Delta in the Northwest Territories, is "Never Say Die." So when the close-knit community of 600 noticed an alarming trend—a high number of people were getting sick with stomach cancer—they decided to act. "In the past, we hardly ever buried anyone except elders. The graveyard wasn't touched for so long," says child-care worker Annie Buckle, 54. Now, "there's a new gravesite. You'd be surprised by the dates [on the headstones]." Buckle says she lost her mother to stomach cancer last year.

The culprit, residents believed, was a common bacteria: *Helicobacter pylori*. The spiral-shaped bug, which lives in the human stomach or intestine, is a major cause of gastric cancer and peptic ulcer disease. (Gastric cancer is the second most common cancer among Inuit men, but ranks 10th overall for Canadian men.) So, the community invited a medical team from Edmonton and Yellowknife to investigate. In February, 27 doctors, nurses and researchers descended on Aklavik, surveying 314 people and endoscopic 193. Among 255 people given a breath test for *H. pylori*, 57 per cent came back positive. Buckle was one of them: she took a preventative 10-day course of antibiotics to rid herself of the bug. All who tested positive, symptomatic or not, will be offered treatment.

Humans have lived with *H. pylori* for over 50,000 years. Now, across the developed world, it's rapidly going extinct. A century ago, it's thought that nearly everyone had it in their stomachs; today, thanks to clean water, better hygiene and antibiotics, just five per cent of people born in the 1990s do, according to one U.S. study. (The bacteria, which is transmitted orally or fecally, is more prevalent in rural and developing areas.) The benefits of eradicating *H. pylori* have been great. "Ulcer disease is going away; stomach cancer is going away," says Dr. Martin Blaser, chair of the Department of Medicine at the New York University School of Medicine, whose work was instrumental in linking *H. pylori* to gastric cancer. But as those ailments disappear, "new diseases are rising," he adds.

And the loss of *H. pylori* could be partly to blame. A growing body of research suggests the bug might not just cause ulcers and cancer—it could actually prevent some diseases, too. As *H. pylori* is wiped out, a host of health problems are on the rise: more than half of the population in Canada is now overweight or obese. Over 15 per cent of kids aged four to 11 suffer from childhood asthma. Six million Canadians have gastroesophageal reflux disease (better known as GERD), when stomach contents splash up into the esophagus. Could the much-maligned bacteria actually protect against these conditions? Blaser believes it might. "If the world is more complicated than what was originally proposed, then so be it," he says. "The question is, what's the truth?"

Once rare, esophageal adenocarcinoma (a cancer of the esophagus) is now the fastest-increasing cancer in several developed countries, including the U.S. and the U.K., Blaser notes. In both places, it now constitutes roughly half of all esophageal cancer cases. Yet people who carry a certain strain of *H. pylori* are almost half as likely to get this disease, according to a recent review of medical literature (published in the October issue of *Cancer Prevention Research*).

Co-author Dr. Farin Kamangar, a research fellow at the U.S. National Cancer Institute, says *H. pylori*

likely reduces the risk of esophageal adenocarcinoma in two ways. The bacteria “makes your stomach produce less acid,” he explains. (Acid reflux is a risk factor for the disease.) It may also impact weight gain, another important contributor. The human stomach produces two hormones that regulate appetite: ghrelin (which tells us to eat) and leptin (which tells us not to). *H. pylori* seems to lower ghrelin production in the stomach, Kamangar says. Considering the current obesity crisis, this has startling implications. “A generation of children are growing up without *Helicobacter* in their stomachs to regulate these two hormones,” says Blaser.

Like obesity and acid reflux, asthma was virtually unknown a century ago—and today, it’s common across the developed world. A recent study concluded that kids aged three to 13 who carry *H. pylori* are almost 59 per cent less likely to have asthma. What’s more, teens and kids were 40 per cent less likely to have hay fever and associated allergies, like eczema and rashes. Blaser, who co-authored the study, believes *H. pylori* could affect how a child’s immune system develops. An early encounter with *Helicobacter*, he suggests, could help their bodies learn to better respond to allergens, curbing the inflammation that triggers an asthma attack.

Blaser’s work follows on the heels of a study by University of Manitoba researcher Anita Kozyrskyj, published last year, showing that babies who received one or two courses of antibiotics before age one were 20 per cent more likely to have asthma by age seven. “With antibiotics, we’re changing our normal microbiota, including *Helicobacter*,” Blaser says. “Mothers, when you give antibiotics to your kid with an ear infection, there may be hidden, long-term costs.”

Will we be better off when *H. pylori* is gone for good? Dr. Karen Goodman, associate professor of epidemiology at the University of Alberta, is overseeing the Aklavik *H. Pylori* project. “It’s still quite a minority view that *H. pylori* infection might have some benefits,” she says. “The standard is, if the infection is detected in someone, that person should be offered treatment.” And the gains created by knocking out the bacteria can’t be taken for granted. “We used to see a duodenal ulcer every day,” says Canadian Digestive Health Foundation president Dr. Richard Fedorak, a professor of medicine at the University of Alberta, who’s also involved in the Aklavik project. “Now, we don’t see one for a week.”

Reached over the phone in Canberra, Nobel laureate Dr. Barry Marshall—one of the two Australian researchers who discovered *H. pylori* over 20 years ago and its role in gastritis and peptic ulcer disease—is even more explicit. “I’ve treated thousands of people with *Helicobacter*, and I don’t have any who’ve come back and said, ‘Dr. Marshall, I want it back please, I was healthier before,’ ” says Marshall (who famously drank the so-called “ulcer bugs” in a cocktail, to prove they caused ulcers). “They could do that,” he adds, “because I have all the strains in my refrigerator.”

Yet Blaser says we shouldn’t dismiss the notion that some strains of *H. pylori* could be beneficial. “If someone has an ulcer, no question that *Helicobacter* should be removed,” he says. As for getting rid of it altogether, “I think we don’t know enough. We need to learn more.”

After researching the bacteria for over two decades, Blaser has a new theory. “In biology, we talk about the idea of symbiosis, where two life forms help each other,” he says. Blaser believes that *Helicobacter* has become perfectly symbiotic with humans. “It helps us when we’re young, and kills us when we’re old,” he says. “That’s bad for the individual, but it’s good for the species.” The trick, Blaser says, is learning how to beat nature. He can envision a future where, once *H. pylori* is better understood, babies might be colonized with good strains of the bacteria to reap its protective benefits.

Barry Marshall’s opinion is different. “Maybe *H. pylori* did have a useful purpose in ancient history, because if you didn’t live very long, you could never develop stomach cancer,” he says. “But nowadays,

it's doing more harm than good." When asked about the potential that this bacteria could have some positive health effects, he says: "Smoking helps prevent ulcerative colitis. The question is, if you get colitis, do you start smoking?" If H. pylori disappears altogether, Marshall says, "I think we'd be healthier."

Back in Aklavik, those who tested positive for H. pylori will receive treatment in November. Researchers plan to follow up in January, and again in 2010. Ridding the community of the bacteria will be a challenge, Karen Goodman admits. "People can be resistant to treatment, and there are huge strain variations," she says. Beyond that, there's always the possibility of reinfection. Yet community education is another important goal of the program, which has already been hailed a success. The town of Old Crow in the Yukon has approached Goodman about taking it there next.

Over 20 years after H. pylori was discovered, the notion that stomach cancer and peptic ulcer disease—two conditions that have afflicted millions worldwide—can be fended off with an antibiotic treatment, is still a medical mind-blower. It's provided hope to countless people, Buckle included. Before the team's visit, "I could feel that people were scared," she says. Afterwards, "there was a lift in the community. It made us feel like we're not in a bad picture anymore."

Tags: [aboriginal](#), [bacteria](#), [cancer](#), [Helicobacter pylori](#), [north](#), [stomach](#)
Posted in [Health](#) |

Macleans.ca is proudly powered by [WordPress](#)

<http://blog.macleans.ca/2008/10/09/eradicating-a-bad-bacteria/> printed on December 10, 2008

»