

# Infection with stomach bacteria may increase risk of Alzheimer's disease

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Infection with the stomach bacterium *Helicobacter pylori* could increase the risk of developing Alzheimer's disease: In people over the age of 50, the risk following a symptomatic infection can be an average of 11

percent higher, and even more about ten years after the infection, at 24 percent greater risk.

These are the findings of a study by Charité—Universitätsmedizin Berlin and McGill University (Canada), now published in the journal *Alzheimer's & Dementia*. The researchers analyzed three decades' worth of patient data.

As today's population ages, dementia is set to become more common, tripling in prevalence in the next 40 years. With no cure in sight so far, researchers are trying to pinpoint the [risk factors](#) involved in dementia in hopes of specifically targeting those factors.

## **Helicobacter pylori enters the central nervous system**

Researchers have long suspected *Helicobacter pylori*, a common gut microbe, of being a potential risk factor. Nearly one-third of all people in Germany are infected with this type of bacteria. An infection can be asymptomatic, but the bacteria can also cause inflammation of the stomach lining or even stomach cancer. Numerous lab studies have also found a link between *H. pylori* infection and the central nervous system.

"We know that the bacterium can reach the brain via various routes, potentially causing inflammation, damage, and the destruction of neurons there," explains Prof. Antonios Douros, a pharmacoepidemiologist at Charité and the first author of the study. When the stomach has been damaged by these microbes, it is also no longer able to absorb Vitamin B12 or iron effectively, which also increases the risk of dementia.

However, many of the studies performed to date on the association between *H. pylori* infection and Alzheimer's disease suffered from methodological limitations—for example, because the number of people

studied was simply too low. One outcome of this was that before now, it was also not possible to say just how strong a link there is between this type of bacterial infection and Alzheimer's disease.

## **Representative study of over four million people**

Douros, Prof. Paul Brassard of McGill University in Montreal, and their colleagues have now compensated for those limitations. Not only did their study have a very large sample size, at over four million people, but it also considered the [time interval](#) between infection and a possible increase in the risk of Alzheimer's disease. The researchers used data gleaned from electronic patient records in the UK to quantify the link between H. pylori and Alzheimer's disease over the course of a person's lifetime.

"Our study shows that symptomatic infections with H. pylori after the age of 50 can be associated with an eleven percent increase in the risk of Alzheimer's disease. The risk increase peaks at 24 percent about a decade after the [initial infection](#)," Douros says.

But that doesn't mean everyone who has experienced a symptomatic infection will necessarily go on to develop Alzheimer's disease. The calculations show an increase in the relative risk compared to people who did not experience a symptomatic H. pylori infection after the age of 50.

"To us, this finding reinforces the assumption that an H. pylori infection could be a modifiable risk factor for Alzheimer's disease," Douros concludes.

However, the researchers caution about whether efforts to eradicate this gut microbe might actually affect the development of Alzheimer's disease, and if so, to what extent it would need to be tested in large-scale

randomized studies first.

**More information:** Antonios Douros et al, Clinically apparent *Helicobacter pylori* infection and the risk of incident Alzheimer's disease: A population-based nested case-control study, *Alzheimer's & Dementia* (2023). [DOI: 10.1002/alz.13561](https://doi.org/10.1002/alz.13561)

Provided by Charité—Universitätsmedizin Berlin

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