

INFECTION

***Giardia lamblia* is associated with an increased risk of both IBS and chronic fatigue that persists for at least 3 years**

The findings of a study by general practitioners and infectious disease specialists in Norway have shown that the clinical consequences of infection with *Giardia lamblia* are more serious than previously thought. “There have been other outbreaks of giardiasis in Europe and North America,” explains Knut-Arne Wensaas of the Research Unit for General Practice, Uni Health, Bergen, and the study’s corresponding author, “but before the outbreak in Bergen very little research had been done on complications after giardiasis.”

The outbreak of acute giardiasis in Bergen occurred in the autumn of 2004 and it has been estimated that 2,500 people received treatment with metronidazole for *G. lamblia* infection during this time. Previously, the researchers had shown that gastrointestinal symptoms were prolonged in a sample of general practice patients 1 year after the outbreak despite eradication of *G. lamblia*. They also reported that 2 years after the outbreak, the prevalence of gastrointestinal

symptoms and tiredness was high in a larger population of patients who had a stool sample positive for *G. lamblia* during the outbreak. These prior findings, the need to use validated questionnaires to confirm the diagnosis of IBS and chronic fatigue, and the need to include a control group, led Wensaas and colleagues to undertake the current study.

Stool samples processed by the parasitology laboratory at Haukelan University Hospital, which serves the Bergen area, identified 1,253 cases of giardiasis that were attributed to the outbreak during a period spanning October 2004 to December 2005. As 1 patient died during the follow-up period, 1,252 exposed patients were included in the current, historic cohort study. Each exposed patient was age and sex matched with two people randomly selected from the population of Bergen. Two more controls were added if no response was obtained from the original two controls to try to overcome any potential bias introduced by a low response rate. The questionnaires mailed in October 2007 were the Rome III

Diagnostic Questionnaire and the validated Fatigue Questionnaire.

817 of the 1,252 exposed patients returned completed questionnaires compared with 1,133 of the 3,598 matched controls (65.3% versus 31.5%)—5 controls were excluded because a diagnosis of giardiasis had been made during the outbreak. 96.4% of respondents answered the IBS questions and 98.3% answered the fatigue questions.

The prevalence of IBS was 46.1% in exposed patients versus 14% in controls. The authors report that 69.7% of IBS cases in the exposed patients could be attributed to giardiasis. Similarly, chronic fatigue had a prevalence of 46.1% in exposed patients versus 12.0% in controls. The adjusted relative risk (RR) of IBS 3 years after acute giardiasis was 3.4 and for chronic fatigue was 4.0. In addition, 62.6% of exposed patients who had IBS also had chronic fatigue, whereas 30.6% of exposed patients without IBS had chronic fatigue. The figures for the control group were 32% and 9%, respectively. The adjusted RR for having both IBS and chronic fatigue in exposed patients was 6.8.

“The exposure is well defined and the association is so strong that it supports the conclusion that *G. lamblia* infection can actually trigger IBS and chronic fatigue in patients in nonendemic areas,” says Wensaas. The researchers have now gone even further and performed a follow-up study 6 years after the outbreak. “We also want to include data on sick leave (as a measurement of health state) prior to and after the outbreak to look at both premorbid health and to get another estimate of loss of function,” Wensaas concludes.

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The city of Bergen on the western coast of Norway. The Svartediket reservoir, which was contaminated with *Giardia lamblia*, is shown in the lower right-hand corner. Image courtesy of K.-A. Wensaas.