

# Intestinal parasites alter immunity in cholera patients

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Cholera patients also infected with parasitic intestinal worms have a significantly reduced immune response to the cholera toxin, according to a report published March 31st in the open-access journal *PLoS Neglected Tropical Diseases*. Results of the study from a collaborative team led by researchers at Massachusetts General Hospital (MGH) and the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) suggest that parasitic infection could reduce immunity to future cholera infection and may compromise the effectiveness of cholera vaccines.

*Vibrio cholerae* infections cause an estimated 5 million cases of [cholera](#) annually worldwide, primarily in impoverished areas with poor sanitation. Intestinal parasites, such as the worms called helminths, are also common in developing areas when cholera is endemic, but there has been little investigation into the impact of infection with both types of pathogen.

For the current study, the research team enrolled about 400 cholera [patients](#) who came to ICDDR,B between 2001 and 2006. After verifying that participants were infected with *V. cholerae*, the investigators examined stool samples for the presence of intestinal parasites. Blood samples were collected the day after patients enrolled in the study and 7 and 21 days later.

Of 361 patients with confirmed cholera who completed the 21-day follow up, 53 were also infected with at least one intestinal parasite,

most frequently helminths. Analysis of participants' blood samples showed that helminth-infected patients had a significantly reduced [immune response](#) to the cholera toxin, with the greatest reduction in the IgA antibodies that are secreted in the intestine. The response against a sugar-based molecule that is also important in the immune response was not reduced, implying that the reduced response could relate to the effects of helminth infection on CD4+ helper [T cells](#).

"It's been a puzzle as to why cholera vaccines that initially look so promising in trials in volunteers in Europe and the United States have been much less effective in inducing a strong immune system response in countries where cholera occurs. Our study supports the idea that co-infection with intestinal worms may be part of the explanation for that discrepancy," says Jason Harris, of the MGH Division of Infectious Disease, the study's lead author. "Although we need additional studies to understand the reason for the association between helminths and decreased immune responses to cholera, this study shows that deworming programs could have an added benefit, especially in countries where cholera is present."

More information: Harris JB, Podolsky MJ, Bhuiyan TR, Chowdhury F, Khan AI, et al. (2009) Immunologic Responses to *Vibrio cholerae* in Patients Co-Infected with Intestinal Parasites in Bangladesh. PLoS Negl Trop Dis 3(3): e403. doi:10.1371/journal.pntd.0000403, [dx.plos.org/10.1371/journal.pntd.0000403](https://doi.org/10.1371/journal.pntd.0000403)

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