CHOLERA TOXIN-SPECIFIC MEMORY B CELL RESPONSES ARE INDUCED IN PATIENTS WITH DEHYDRATING DIARRHEA CAUSED BY VIBRIO CHOLERAE O1

Channa R. Jayasekera1,3, Jason B. Harris2,3, Saruar Bhuiyan1, Fahima Chowdhury1, Ashraful I. Khan1, Abu S.G. Faruque1, Regina C. LaRocque2, Edward T. Ryan2, Firdausi Qadri1, Stephen B. Calderwood2

1International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B), Dhaka, Bangladesh
2Division of Infectious Diseases, Massachusetts General Hospital, Boston, Massachusetts

Background: Infection with Vibrio cholerae induces durable immunity against subsequent disease, a process hypothesized to reflect anamnestic immune responses at the intestinal mucosa. The presence of antigen-specific memory B cells may therefore be a more direct measure of protection than serum antibody responses.

Methods: We measured IgG memory B cells specific to cholera toxin B subunit (CTB) in 14 patients during and up to 90 days after V. cholerae O1 infection, by polyclonal stimulation of peripheral blood mononuclear cells followed by standard ELISPOT.

Results: All patients generated CTB-specific IgG memory B cell responses by day 30 (mean 0.10%, range 0.037-0.28% of total circulating IgG memory B cells) that persisted to day 90 (mean 0.07%, range 0.003-0.27%). In contrast, circulating CTB-specific IgG antibody secreting cells (ASC), and titers of serum vibriocidal and anti-CTB antibodies peaked on day 7 and declined to undetectable or significantly lower levels by day 90.

Conclusions: CTB-specific IgG memory B cell responses are detectable in circulation at least three months following V. cholerae O1 infection, and remain measurable even after serum antibody titers have declined to undetectable or considerably lower levels. This suggests that antigen-specific memory B cells may be a useful long-term marker of immunity to cholera.