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Synergy (not polarization) between Th1 and Th2 responses against *Mycobacterium tuberculosis* infection: Evidence from an endemic setting

At present, tuberculosis (TB) caused by *Mycobacterium tuberculosis (Mtb)* kills an estimated 2 million people globally, more people than HIV/AIDS and malaria combined. The only licensed vaccine currently in use, BCG does not control *Mtb* transmission. Efforts to develop an efficacious vaccine against *Mtb* infection during the last three decades have achieved moderate success because of lack of knowledge about correlates of protective immunity and the Th1/Th2 paradigm. According to the Th1/Th2 paradigmTh1 cells protect against intracellular pathogens, whereas Th2 cells protect against extracellular pathogen. In the past, it was generally accepted that interferon-gamma (IFN-γ)-producing Th1 cells are protective against *Mtb* infection, whereas the role antibodies was ignored. Earlier, we have argued that antibodies may play a crucial role against TB (Abebe & Bjune, 2007) and that IFN-γ may not be the right marker for protective immunity against TB (Abebe, 2012). As a part of a major project to identify protective immune markers in *Mtb* endemic population, we assessed specific antibody and cytokine responses against selected Mtb antigens (LAM, Rv2031, HBHA, the 38-kDa antigen, and ESAT-6/CFP-10) in pulmonary TB patients (PTBP), their household contacts (HHCs) and community controls (CCs) longitudinally.

Our results show that the levels of IFN-γ (Th1) and IgA (Th2) against HBHA (a promising candidate vaccine) were elevated concurrently in CCs (with no history of clinical TB) compared to PTBP and HHCs (*Mtb* infected). On the other hand, the level of IFN-γ against ESAT-6/CFP-10 (another candidate vaccine) was elevated in PTBP but was depressed in HHCs and CCs (with no clinical TB). Results of the present study may suggest that there is a synergy between Th1 (IFN-γ) and Th2 (IgA) responses against HBHA of *Mtb*. These results will be discussed in line with emerging evidence for the protective role of antibodies against *Mtb* infection and the Th1/Th2 paradigm.

Biography

Fekadu Abebe (PhD) is a senior scientist at the University of Oslo, Norway. He is an expert in infection immunity at the University of Oslo, where he is involved in teaching and supervision of PhD and MPH students. He has led several projects related to tuberculosis including studies of biomarkers of protective immunity against tuberculosis in human population in endemic setting. He has published over 50 articles in peer reviewed scientific journals (mostly as first or senior author).

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