Study provides important insights into tuberculosis correlates of protection

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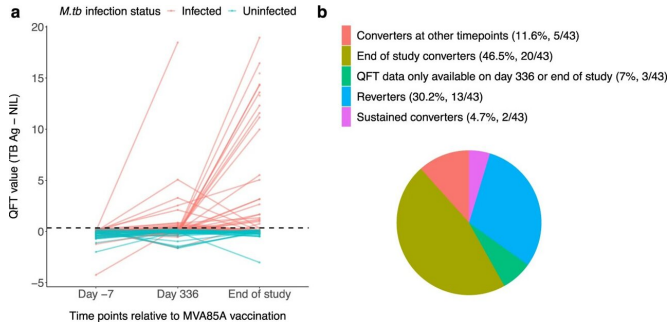

QuantiFERON-TB Gold In-Tube conversion of infants. **a** QFT over time for all *M.tb*-infected infants with quantitative QFT, QFT IFN-? is presented in IU/ml on Day ?7, Day 336 and end of study. Each line represents an infant. **b** Conversion and reversion data for all *M.tb*-infected shown as percentages of total *M.tb* infected infants. Credit: *Nature Communications* (2022). DOI: 10.1038/s41467-022-34061-7

Researchers from the University of Oxford have today reported findings from a study that investigated whether previously identified correlates of protection associated with risk of full-blown tuberculosis (TB) disease could also be associated with risk of infection from the bacteria that causes TB—highlighting certain correlates in the process.

In their paper on the TB020 study, published in *Nature Communications*, researchers identified that certain correlates of protection—inflammation and activation of the immune system (where the body responds to invading pathogens such as viruses and harmful bacteria)—were associated with the likelihood of becoming infected with Mycobacterium tuberculosis (M.tb), the bacteria that causes TB disease.

However, their previously identified correlates of risk of TB disease were not associated with an increased risk of M.tb infection in infants who became infected with the bacteria but did not progress to active TB.

Most individuals infected with M.tb do not progress to full TB disease. Instead, infection is either eliminated or contained by the infected individual. This study improves understanding of the immune-related factors that drive infection and disease—necessary for an effective TB vaccine that is yet to be developed.

The identification of specific correlates of protection for infection could support the development of a vaccine against M.tb that would then help prevent progression to TB disease. Confirming or not whether there are common correlates of risk for both TB disease and M.tb infection is also important for using prevention of infection studies—which are quicker and more cost effective than prevention of disease (PoD) studies as numbers of infected individuals far exceed those who get TB disease—as a substitute for PoD studies to accelerate TB research.

Helen McShane, Professor of Vaccinology at the Jenner Institute, Nuffield Department of Medicine, University of Oxford, said, "We are delighted with the findings of this immune correlate study showing immune correlates of risk of TB disease and M.tb infection are different—these findings give insight into what kind of immune response is needed in a new TB vaccine and also suggest that prevention of infection studies should not be used as a selection process for prevention of disease studies and vaccines as results may be misleading."

The research team analyzed blood samples from 43 HIV-negative South African infants aged three to six months who received BCG within seven days of birth and previously participated in a trial assessing the efficacy of the MVA85A TB vaccine.

More information: Iman Satti et al, Inflammation and immune activation are associated with risk of

Mycobacterium tuberculosis infection in BCG-vaccinated infants, *Nature Communications* (2022). DOI: 10.1038/s41467-022-34061-7