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ABSTRACT BOOK

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PS-94838-07 BCG vaccination augments human humoral as well as cellular anti-mycobacterial immunity

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Background: A blood test to predict TB susceptibility would facilitate TB control. We optimised an assay of human anti-mycobacterial immunity to differentiate between humoral and cellular immunity.

Methods: Luminescent mycobacteria were added to 715 whole-blood and 697 plasma samples from healthy adult volunteer participants in Peru. A portable luminometer was used to estimate mycobacterial growth/killing over 96 hours incubation at 37°C. Growth/killing of mycobacterial was compared between participants without BCG vaccination scars vs. those with single vaccinations vs. multiple BCG vaccinations.

Results: The number of volunteers with 0, 1, 2 or ≥ 3 BCG scars was 157, 266, 202 and 90 respectively. The graph illustrates how mycobacteria grew less in whole blood from BCG vaccinated individuals compared to unvaccinated individuals ($P < 0.001$). Furthermore, mycobacteria grew less in whole blood from subjects who had received multiple BCG vaccinations compared with those who had received only one ($P = 0.05$). The association between growth of mycobacteria and number of BCG vaccinations was not confounded by age in a multiple linear regression analysis. This pattern was also observed in plasma, where the mycobacterial growth was significantly diminished in BCG vaccinated subjects vs. unvaccinated individuals ($P < 0.004$). However, no additional effect of multiple BCG vaccinations was noted compared to one vaccination (all $P > 0.6$).

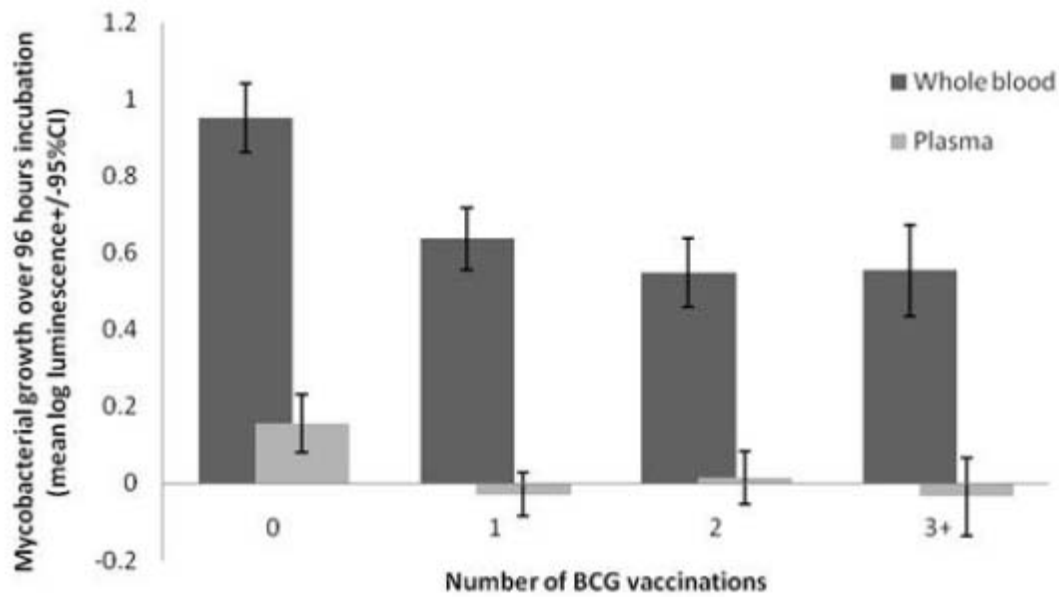


Figure Mycobacterial growth in blood and plasma: the effect of BCG vaccination.

Conclusion: Analysis using this bioassay suggests that BCG vaccination augments humoral as well as cellular anti-mycobacterial immunity and that cellular anti-mycobacterial immunity is augmented more by multiple than single vaccinations.