

Serum biomarkers: a tool to differentiate latent tuberculosis and pulmonary tuberculosis in children and adolescents

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Diagnosis of TB in children and some adolescents remains a challenge, as they often present paucibacillary disease as well as nonspecific symptoms and radiological findings. Moreover, current diagnostic methods, such as tuberculin skin test and interferon- γ assays, are unable to differentiate latent from active TB. Lipids and proteins present in the *Mycobacterium tuberculosis* cell wall induce a specific immune response in the host, a biomarker that may be useful as a pediatric TB diagnostic tool. Our research aim is to determine if serum levels of IgM anti-*Mtb* lipids (cardiolipin, sulfatide, mycolic acids) and IgM and IgG anti-mammalian cell entry protein (Mce1a) can be used to differentiate latent and active pulmonary TB. Children and adolescents with pulmonary and latent TB, with or without household contact, are being recruited from 7 health units and hospitals in the Rio de Janeiro metropolitan area. Asymptomatic children and adolescents, with no household TB contact, are invited to participate as healthy controls. Measurement of biomarker antibodies is being performed with enzyme-linked immunosorbent assay (ELISA). Preliminary analysis has been performed on 10 pulmonary TB, 9 latent TB and 15 healthy subjects. In these groups, the mean age was 9.9 (SD=6.86), 5.6(SD=4.22) and 7.3 years old (SD=6.17), respectively. Sputum was acid-fast bacilli positive in 6 TB subjects. Four pulmonary TB patients were positive under the Brazilian Ministry of Health score system. ELISA results showed biomarker levels 1.3-2.3 times higher in pulmonary versus latent TB samples. IgG and IgM anti-Mce1 levels differed in active TB, latent TB and healthy control, whereas anti-lipid antibodies were similar in active TB and healthy control. Antibody levels for all the antigens except cardiolipin were higher in score-system diagnosed and acid-fast bacilli positive TB when compared with latent TB. Our results indicate these antibodies are promising biomarkers for serodiagnosing TB.

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