Can blood or urine IP-10 discriminate between active and non-active tuberculosis in children?

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BACKGROUND: Childhood tuberculosis (TB) is an urgent problem as TB diagnosis in children is difficult to perform. Interferon-γ-inducible protein-10 (IP-10), either in blood or urine, has been proposed as a TB biomarker for adults. This study aims evaluating the IP-10 diagnostic potentials in children from Uganda, a high TB-endemic country.

METHODS: IP-10 was measured in blood and urine concomitantly taken from children prospectively enrolled with a suspect of active TB with or without HIV-infection. Clinical/microbiological parameters and TB-immune assays commercially available [tuberculin skin test (TST) and QuantiFERON (QFT)] were concomitantly evaluated.

RESULTS: One hundred twenty-eight children were prospectively enrolled. The analysis was performed on 111 children and among them, 80 (72%) were HIV-uninfected and 31 (27.9%) HIV-infected. Thirty-three healthy donors adults (HDA) were included as controls. The data showed that IP-10 is detectable in urine and blood of children with active TB and that its levels associate with the Mtb-load independently from HIV-status. No correlation with age was found (blood IP-10: p=0.1, rs=-0.1; urine IP-10: p=0.8, rs=-0.01). However, although IP-10 levels were higher in active TB children compared to HDA, the accuracy to distinguish active TB from “no active TB” was low and similar to TST and QFT.

CONCLUSION: These results, although insufficient for TB diagnosis, suggest that blood and urine IP-10 allow to assess the state of immune activation and can be used as a potential inflammatory marker for clinical work-up, evaluated easier than the established blood tests such as C-Reactive Protein and Erythrocytes Sedimentation Rate.