

IFNγ/IFNα gene expression profile in blood as a diagnostic biomarker for extra-pulmonary tuberculosis

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Extra-pulmonary TB (EPTB) is a major health problem in India (15-20% of total TB cases) due to its difficult diagnosis often involving invasive procedures like tissue biopsy or an aspirate leading to a delayed treatment or misdiagnosis. Thus, there is a critical clinical need to develop sensitive, non-invasive markers for an accurate and early detection of EPTB. Considering the limited success of individual cytokines towards the diagnosis of EPTB cases, we posited that integrating multiple cytokines in a single output would offer an improved resolution to EPTB diagnosis. To test our hypothesis, we evaluated gene expression ratio of type I interferon (IFNα) and type II interferon (IFNγ) in human blood and determined whether this ratio offers a superior/comparable diagnostic value in different population cohorts. RNA isolated from the blood of 172 individuals (53 clinically confirmed EPTB patients, 66 healthy house-hold contacts (HHC) and 53 healthy volunteers (HV)) was used to determine gene expression of IFNα and IFNγ by real time PCR (2^{-delCt} method). We observed that the median of IFNγ/IFNα for EPTB (4.53, 0.7-37.8) was significantly lower from HHC (11.98, 1.00-85.04, p= 0.002) and HV (9.03, 1.26-46.05, p=0.01). The IFNγ/IFNα median, however, yielded only 58.5% sensitivity among EPTB patients, while the specificity with respect to HV and HHC individuals was 62.30% and 72.70%, respectively. We believe that the measurement of the gene expression ratio of IFNγ/IFNα is a promising approach to differentiate EPTB patients from house hold contacts and can obliviate the need for more invasive testing in these patients.

Biography

Vibha Taneja is a Senior Research Fellow with Indian Council Medical Research and is working on diagnosis of extra-pulmonary tuberculosis (EPTB) in Department of Biotechnology, All India Institute of Medical Sciences (AIIMS), New Delhi, India. She is a published researcher in PLoS One and has previous experience on assessing the gene expression of type I interferons in tuberculosis patients.

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