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Serum cytokine production and the single nucleotide polymorphisms (SNPs) of IFN-γ/IL-12 in active pulmonary tuberculosis patients and household contacts

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Introduction: Household contacts constitute an important target for early prevention and control of tuberculosis (TB). Cytokines implicated in protective immunity may aid in identification of diagnostics and new vaccines. The role for IL-12 and IFN- γ has been established in protection against mycobacterial infections. The balance between the secretions of IL-12/IFN-γ appears to be essential for the regulation of inflammation in response to *Mycobacterium tuberculosis*.

Aim: The aim of the present study was to evaluate the cytokine production and their single nucleotide polymorphisms (SNPs) of IFN-γ and IL-12 in active pulmonary tuberculosis patients and household contacts.

Methods: The cytokine levels were estimated in serum by enzyme-linked immunosorbent assay (ELISA) and their polymorphisms were studied by amplification refractory mutation systems polymerase chain reaction (ARMs PCR) in active pulmonary tuberculosis patients (APTB=130) , household contacts (HHC=150) and healthy controls (HC=120).

Results: The mean concentration of IFN- γ in APTB, HHC and HCs were 186±6.822 pg/ml, 103.7±6.67 pg/ml and 12.34±3.44 pg/ml respectively and were significant at $p<0.0001$ and $p<0.0001$ when compared to controls. The serum levels of IL-12 were high and significant in APTB and HHC (118.8±14.21 pg/ml, 114.6±14.99 pg/ml) compared to HCs (36.11±9.23 pg/ml) at $p<0.0001$ and $p<0.0002$. The AT genotype of IFN-γ (+874 A/T) was found to be associated with disease in APTB and HHC ($p<0.0097$ OR-1.90; CI-1.16-3.10) ($p<0.04$ OR-1.62; CI-1.01-2.60) when compared to HCs. The genotype and allele frequencies of IL-12 -1188C/A did not show any significant difference between the subjects. The above results have not shown any significant difference in serum levels of IFN-γ and IL-12 between APTB and HHC, indicating HHC might have infection and the AT genotype of IFN-γ which was found to be susceptible to TB was also significant.

Conclusion: These results indicate the association of IFN- γ/IL-12 with the disease and further follow up studies might be useful for identification of household contacts at risk of developing TB.

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