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The role of gene polymorphism and level of anti-inflammatory cytokines in blood at patients with pulmonary tuberculosis

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Background and objective.To study the role of gene polymorphism and level of anti-inflammatory cytokines (interleukin(IL)-4 and IL-10) in blood at patients with pulmonary tuberculosis(PTB).

Methods.The study comprised 80 individuals in Kharkiv region of Ukraine including 59 patients PTB (group1) and 21 healthy donors (group2).Serum levels of cytokines IL-4 and IL-10 were evaluated by ELISA.Investigations of gene polymorphisms of these cytokines were performed using restriction analysis of the amplification products of specific regions of the genome.Two polymorphic variants were examined:C-589T region of IL-4 gene and promoter region G-1082A of IL-10.

Results.In the 1st group the levels of IL-4 and IL-10 were 9.55±0.24 pg/L and 40.04±0.74pg/L, while in 2nd group these values were 29.99±1.27pg/L and 50.25±1.26pg/L respectively($p<0.05$).Among patients with PTB the heterozygous genotype was most prevalent; 67.80±6.08%(N=40) for IL-10 and 59.32±6.40%(N=35) for IL-4.The homozygous genotype was accordingly less common:32.20±6.08%(N=19) and 40.68±6.40% (N=24), of which 11.86±4.21%(N=7) and 15.25±4.68%(N=9) of patients had mutation and remaining had normal homozygote genotype, i.e., 20.34±5.24%(N=12) and 25.42±5.67%(N=15) for IL-10 and IL-4 respectively.In contrast, most of healthy donors had normal homozygous genotype with 61.90±10.86%(N=13)($t=3.45,p<0.05$) and 71.43±10.10%(N=15)(t=3.97,p0.05) and 9.52±6.56%(N=2)($t=3.40,p<0.05$) and heterozygous genotype 23.81±9.52%(N=5)($t=3.89,p<0.05$) and 19.05±8.78%(N=4) ($t=3.71,p<0.05$) for IL-10 and IL-4 genes respectively.

Conclusion.Compared to healthy controls patients with PTB had significantly lower levels of serum IL-4 and IL-10.This coincided with greater frequency of heterozygous polymorphism C-589T and G-1082A genes of IL-4 and IL-10.Further studies are warranted whether higher rate of pulmonary TB has a causal immunogenetic relationship to polymorphism of genes encoding for IL-10 and IL-4.