

Cytokine profile of individuals with TB/HIV co-infection during HIV and TB treatment

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Objective: Cytokines are important immunomodulating agents of the immune system. Cytokine profile during HIV infection is rather well studied. But there is still little data related to the immune status of individuals with TB/HIV co-infection and especially during HIV and TB therapy.

Methods: A study was conducted in a cohort of patients with TB/HIV co-infection at the Moscow Tuberculosis Clinic. All patients were drug-naïve. For the study of cytokine profile the blood samples were taken before therapy and at 30, 60, 90 and 150 days after initiation of HIV/TB treatment. Patients were divided into two groups according to CD4+T cell count: Group1 (< 200 cells/mm³) and Group2 (> 200 cells/mm³). Statistical analyses was performed using BioStat analysis programme.

Results: In total 83 patients were enrolled in the study (with their informed consent). Afterwards 21 patients were excluded due to non-adherence to the HIV-treatment. The mean age of patients was 35,8 years and 80% of the participants were male. Differences in expression of INF- γ , IL-4, IL-6, IL-10 between Groups 1 and 2 were most evident before therapy. For both groups decrease of pro- and anti-inflammatory cytokines were observed. Though a difference was observed in the expression of IL-6 for Group1 (n=38). The decrease of IL-6 levels was on 30 days of HIV/TB treatment, than abrupt increase on 60 days of therapy and then IL-6 decreased again. For Group 2 (n=24) the decrease of IL-6 was observed steadily over all period of study. In general lower levels of IL-4, IL-6, IL-10 were observed for Group2 before therapy in comparison with Group1. However for IFN- γ levels there were not significant differences between both Groups before or after therapy. Also increased CD4+ cell count and reduced viral load was observed for both Groups after initiation of therapy.

Conclusion: The findings indicate that independent of their immunosuppression profile all HIV/TB patients were able to recover immune status after initiation of HIV/TB treatment. Though the patients with severe immunosuppression after initiation of therapy had an immune activation more intense compared with Group2 (CD4+ > 200). The abrupt increase of IL-6 in patients with severe immunosuppression in absence of immune reconstitution inflammatory syndrome (IRIS) suggests a less effective immune reconstitution due to the fact that median CD4+ cell count for Group1 was <56 cell/mm³.

CD4+ cells/mm ³	IL-4(pg/ml)	IL-6(pg/ml)	IL-10(pg/ml)	IFN- γ (pg/ml)
		B 25,9 (5-165)		
< 200	B* 7,3 (0-50)	60 days 44,9 (20-160)	B 9,1 (5-20)	B 11,5 (0-60)
	A^ 1,1 (0-10)	90 days 18,4 (5-95)	A 5,2 (0-10)	A 4,5 (0-55)
> 200	B 5,7 (0-18)	B 6,0 (0-15)	B 3,1 (0-7)	B 15,0 (0-60)
	A 1,2 (0-5)	A 6,1(0-15)	A 4,1 (0-5)	A 4,2 (0-45)

B* - before treatment

A^ - after treatment

For all tests P<0.05 was considered significant