



## Th1, Th2 and Th3 cytokine alteration in schizophrenia

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### Abstract

**Background:** Several studies have shown that there is an imbalance between T helper 1 (Th1) cytokines and T helper 2 (Th2) cytokines in patients with schizophrenia. The T helper 3 (Th3) cytokine, transforming growth factor beta-1 (TGF- $\beta$ 1), has been shown to suppress the production of Th1 cytokines. Therefore it is hypothesized that it may play a role in schizophrenia by suppressing overactive Th1 system.

**Methods:** We recruited 88 schizophrenic patients and 88 matched controls. The basal plasma concentrations of IFN- $\gamma$  (Th1), IL-4 (Th2) and TGF- $\beta$ 1 (Th3) were studied at the time the patients were admitted to the hospital and following 8 weeks of treatment with antipsychotics.

**Results:** The detection rate of plasma IFN- $\gamma$  and basal plasma TGF- $\beta$ 1 level were significantly higher in schizophrenic patients than in controls whereas detection rate of plasma IL-4 was lower in patients. The ratio of Th1/Th2 cytokines (IFN- $\gamma$ /IL-4) was higher in schizophrenic patients. Following the neuroleptic treatment, the IFN $\gamma$  and TGF- $\beta$ 1 levels returned to control values, and IL-4 concentration rose above the control value.

**Conclusion:** Schizophrenic patients showed higher Th1/Th2 ratio which is attenuated by effective neuroleptic treatment. It is possible that TGF- $\beta$ 1 plays a role in reducing the activity of Th1 cytokine.

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