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Research report

Th1, Th2, and Th3 cytokine alterations in major depression

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Abstract

Background: Many studies have shown that the balance between Th1 cytokines and Th2 cytokines plays a role in modulation of cellular responses in the brain during psychological stress and psychiatric disorders. The Th3 cytokine, transforming growth factor beta-1 (TGF-β1), has been shown to regulate the balance between Th-1 and Th-2 cytokines. However, the role of TGF-β1 in the psychoimmunology of depression has never been explored.
Methods: A total of 40 depressed patients and 80 normal controls were recruited. The plasma levels of IFN-γ, IL-4, and TGF-β1 were studied at the time of admission and 8 weeks after antidepressant treatment.
Results: The proportion of patients who showed immunoreactivity to IFN-γ and IL-4 in the plasma, and the plasma IFN-γ/IL-4 ratio, were significantly higher in depressed patients than in controls. The IFN-γ/TGF-β1 ratio was also higher in depressed patients, and TGF-β1 levels showed a significant negative correlation with the HDRS depression scale. After treatment, TGF-β1 level increased significantly, and the IFN-γ/IL-4 ratio decreased significantly, in the patient group. However, Th1 changes in male and female showed different trend such as Th1 arm was decreased after the treatment in all male, whereas it was increased in premenopausal age women.
Limitations: Replication and extension using a larger sample size are required.
Conclusions: The Th1 and Th2 cytokine imbalance was observed in subpopulation of depressed patients. TGF-β1 seemed to play a role in the pathophysiology of depression in this population. Moreover, antidepressant treatment was found to affect the Th1/Th2 balance through the action of TGF-β1.

Keywords: Interleukin; Interferon; TGF; Cytokine; Major depression