Low-dose exogenous interleukin (IL)-12 enhances antigen-induced interferon-γ production without affecting IL-10 production in asthmatics

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Background: Although interleukin (IL)-12, IL-10 and interferon (IFN)-γ are key cytokines that control the T helper (Th) 1/Th2 balance in human allergic disorders, details of their interactions in humans have not been clarified. Recently IL-10, one of the Th2 cytokines, has been shown to have an anti-inflammatory effect against allergic responses. To clarify the effect of IL-12 on the production of IFN-γ and IL-10, in the present study we examined responses of peripheral blood mononuclear cells (PBMC) from asthmatics to stimulation by Dermatophagoides farinae (Df) antigen in the presence of exogenous IL-12.

Methods: Peripheral blood mononuclear cells of Df-sensitized (n = 7) and non-sensitized (n = 5) asthmatics were stimulated by Df antigen after incubation with exogenous IL-12 (100 pg/mL). Interferon-γ and IL-10 produced in culture supernatants were measured by ELISA. The effect of IL-12 on lymphocyte proliferation was assayed by [3H]-thymidine incorporation in both groups.

Results: The production of IFN-γ by PBMC was significantly enhanced by incubation with IL-12 in both patient groups ($P < 0.05$), while IL-12 did not affect the production of IL-10 in either group. Lymphocyte proliferation induced by Df antigen was significantly higher in the Df-sensitized group ($P < 0.01$). This lymphocyte proliferation was significantly enhanced by exogenous IL-12 only in the Df-sensitized group ($P < 0.05$).

Conclusions: These observations indicate that IL-12 enhances Th1-shifted immune responses without affecting IL-10 production and suggest that IL-12 may effectively inhibit the Th2 dominant state of bronchial asthma by regulating the Th1/Th2 balance.

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