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Serum IgE levels in HIV-infected patients in Poland

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Key words: chemokines; HIV; serum IgE.

● DAMAGE to functional cellular mechanisms may be observed during the progression of HIV infection. The absolute number of CD4+ T (CD4+) cells decreases in the later phases of HIV infection. Despite

the immune deficit, the progression of HIV infection is accompanied by the stimulation of antibody synthesis; e.g., IgE. IgE overproduction may have clinical effects, such as predisposition to IgE-mediated allergic reaction, an effect which could partially explain the higher susceptibility to allergic reactions in HIV-infected (HIV+) patients, especially in the later stages of infection. This study aimed to evaluate the total serum IgE level (sIgE), its individual dynamics, and the dependence on CD4+ in a group of HIV+ patients from Poland.

The study group comprised 177 adult subjects from Poland, in different stages of HIV infection, whose sIgE concentration and CD4+ in peripheral blood were determined. In this group, 33 HIV+ subjects

had two and 15 three determinations of the above-mentioned parameters at average intervals of 18 months. The control group included 144 healthy blood donors. The analysis included the differences in sIgE (lnIgE) distribution in HIV+ groups in various stages of the disease according to CD4+/μl; the differences in CD4+ distribution in HIV+ groups with increased and normal IgE; and the frequency of increased sIgE in the control group and HIV+ groups in various stages of disease according to CD4+. Similar analysis was also done in the subgroups of patients who had several determinations of parameters.

Serum samples were checked for anti-HIV antibodies with commercial test kits (Vironostica HIV Uni-Form II plus O, Organon Teknika, The Netherlands). Each positive enzyme-linked immunosorbent determination result was checked again and confirmed by immunoblot (HIV-1 Western-Blot Kit, Organon Teknika, The Netherlands). The CD4 T-cell subset was determined by flow cytometry (Simulstest IMK Plus, Becton Dickinson, USA). Serum IgE antibodies were determined by the fluoroallergosorbent commercial test (Total IgE II Fast Test, Biowhittaker, Inc., USA). The increased serum IgE concentrations corresponded to the above 135 IU/ml. The absolute serum IgE concentrations were also transformed into logarithms.

sIgE (lnIgE) distribution differed between the HIV+ group with CD4+ <199 and the

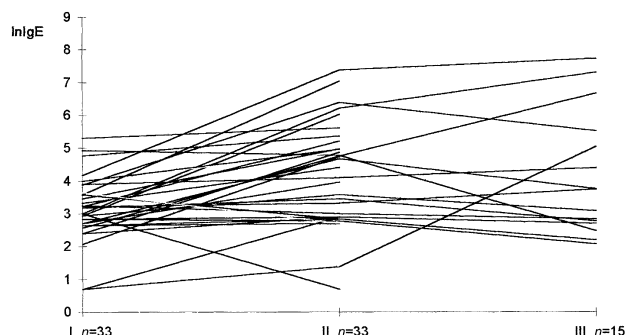


Figure 1. Individual dynamics of lnIgE in succeeding determinations in HIV-infected patients.

groups HIV- and HIV+ with CD4+ >500. A significant difference in sIgE (lnIgE) distribution was also observed between the HIV+ subgroups with CD4+ >500 and 200 <CD4+ <499. Distribution of CD4+ differed between the HIV+ groups with increased and normal sIgE and the control group. In the HIV+ groups, a rising frequency of increased sIgE was observed together with CD4+ depletion. The lowest percentage – 14% in the HIV+ group with CD4+ >500 – was significantly different from the control group, the HIV+ group, and the HIV+ subgroup with CD4+ >500. In the group of HIV+ subjects in whom several parameters were determined, the analysis of CD4+ distribution showed statistically significant differences between all the determinations. sIgE distributions were different between determinations I and II and determinations I and III, and lnIgE distributions differed between determinations I and II. Fig. 1 presents the individual dynamics of sIgE. The frequency of increased sIgE was significantly lower in determination I than in determinations II and III and healthy persons.

In this study, the intensification of IgE synthesis was observed in HIV+ patients together with the progression of HIV infection. This could be explained by the qualitative and quantitative ascendancy of Th₀ and Th₂ lymphocytes (1–3) and higher levels of sCD23 (which could stimulate the IgE production) (4) during HIV infection. In the subgroup HIV+ without CD4+ depletion, the frequency of increased sIgE occurrence was statistically significantly lower than in the general population. If we assume random exposure to HIV infection, people with higher sIgE might be infected less often. The explanation of this phenomenon may be the HIV competition with β -chemokines (which augment tissue concentrations in atopic patients with increased sIgE) for the cellular receptor CCR5, which is a necessary coreceptor for

macrophage-tropic strains of HIV-1 (NSI HIV) (5, 6), which predominate in the early phase of HIV infection.

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Tuberculin-primed PBMC fail to produce TH2-type cytokines

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Key words: atopic allergy; IFN- γ ; IL-4; IL-13; Th1; Th2; tuberculin.

● In allergic rhinitis, the production of Th2 cytokines leads to IgE production, tissue eosinophilia, and allergy symptoms (1). During specific immunotherapy (SIT), the Th2-cytokine production is reconstituted by Th1 cytokines (2). Mycobacteria modify the immune response and have been proposed as adjuvants for SIT (3). Animal models suggest that mycobacteria or their components suppress the Th2 immune response (4). We investigated the allergen-induced cytokine responses of human peripheral blood mononuclear cells (PBMC) primed by tuberculin (PPD).

Ten patients with pollen allergy and seasonal rhinitis verified by skin prick test (six women and four men, 30; 22–42 years of age [median; range]) and five healthy controls with no history of allergic symptoms (three women and two men, 38; 28–43 years of age) gave a blood sample voluntarily after informed consent. Ficoll-isolated, washed PBMC were primed by incubation at 10^6 cells/ml for 3 days with 0, 1, or 10 μ g/ml of PPD (Statens Seruminstitut, Copenhagen, Denmark). The washed primed cells (2×10^6 cells/ml) were cultured with allergens (50 μ g/ml of whole extracts of birch [*Betula verrucosa*] and timothy [*Phleum pratense*], kindly provided by ALK-Abelló [Hørsholm, Denmark]) for 3 days. IL-4, IL-13, IFN- γ , and β -actin mRNA in cell pellets were analyzed by

Allergen-induced IL-4 and IL-13 are downregulated and IFN- γ upregulated.