

SERUM LEVELS OF CYTOKINES IN DIFFERENT STAGES OF THE HIV-1 INFECTION AND THEIR CORRELATION WITH β 2-MICROGLOBULIN SERUM LEVEL, HEMOGLOBIN RATE, T CD₄⁺ AND T CD₈⁺ LYMPHOCYTES COUNT

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ABSTRACT: Presently, the major challenge that specialists have when approaching patients infected by HIV-1, taking into account the individuals' evolutionary diversity, is to establish representative surrogate markers that could indicate the right time to introduce therapeutic procedures. Cytokines produced by different cellular types can modulate the HIV-1 expression and replication. Several scientific reports demonstrate that the predominance of γ -IFN and IL-2 production is associated with effective immune response and good clinical evolution, while high levels of IL-4, IL-10 and α -TNF are associated with the deterioration of the immune function and the development of aids. This way, the objective of this study was to evaluate the serum levels of cytokines in different stages of the infection and their importance as surrogate markers. Serum levels of IL-2, IL-4, IL-10, γ -IFN, and α -TNF were determined by the ELISA method in 81 blood samples, consecutively obtained from 46 HIV-1-infected individuals, from August of 1996 to October of 1997, divided into three groups, according to the number of T CD₄⁺ lymphocytes/mm³: Group 1 (G1)=CD₄⁺>400; Group 2 (G2)=200<CD₄⁺<400; Group 3 (G3)= CD₄⁺<200. Furthermore, correlation and association studies with other surrogate markers were carried out: β 2-microglobulin serum levels, hemoglobin rates, and number of T CD₄⁺ and CD₈⁺ lymphocytes; in order to establish the variables with the best discriminatory power in the studied patients. The results demonstrated that the γ -IFN

and IL-2 serum levels were significantly higher in Group 1 ($G1 > G2 > G3$; $p < 0,001$), while those of IL-10 and α -TNF were significantly higher in Group 3 ($G1 < G2 < G3$; $p < 0,001$), pointing out to a progressive loss of the cellular immune function (Th-1) during the progression of the infection. As for the IL-4 serum levels, although there has been a tendency to increased levels with the progression of the infection in the patients ($G1 < G3$; G2 intermediate), there was not a statistical difference when the groups were compared. The latter result may be due to the extremely short serum half-life of this cytokine. Furthermore, the association study that examines all variables together demonstrated that the γ -IFN and α -TNF serum levels were higher than all the others, according the discriminatory power. These results seem to suggest that γ -IFN and α -TNF serum levels could be useful, when taken together with other classic surrogate markers, such as T CD4⁺ and CD8⁺ lymphocytes counts and plasma viral load, in the indication of the best anti-retroviral regimen for each patient. They could also be used every time a change in the therapeutic regimen has to be made. Besides, it is a low-cost method that is easily carried out among us.

KEY WORDS: AIDS, HIV, cytokines.

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