Soluble E-selectin and P-Selectin Serum Levels in Patients with Psoriasis Compared to Healthy Controls

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Abstract

Introduction: Psoriasis is an inflammatory skin disease in which abnormal individual immune reactivity plays an important role. E-selectin and P-selectin are adhesion molecules expressed on vascular endothelial cells in several inflammatory skin diseases, including psoriasis. The aim of the present study was to describe selected immunological changes, concerning adhesion molecules status (sE-selectin, sP-selectin), in psoriasis and also their correlation with disease activity.

Method: Serum levels of soluble E-selectin and soluble P-selectin were measured by enzyme-linked immunosorbent assay in 58 patients with psoriasis and 24 healthy control subjects. The relationships between these adhesion molecules and the Psoriasis Areaand Severity Index score were investigated.

Result: There was a significant correlation between the serum soluble E-selectin levels and Psoriasis Area and Severity Index score.

Conclusion: Soluble E-selectin serum levels correlate with the extent of psoriatic lesions and could be used as marker of the disease activity in psoriatic patients but this finding needs further modification. *(Iran J Dermatol 2010;13: 9-11)*

Key words: psoriasis, sE-selectin, sP-selectin

Introduction

Psoriasis is a chronic, inflammatory skin disorder with enigmatic etiology and pathogenesis. The probable pathogenesis is the interplay between genetics and environmental factors. Psoriatic plaques are characterized by keratinocyte hyperproliferation, vascular endothelial proliferation, and inflammatory cell infiltration [1-3].

T-cells play a key role in the pathogenesis of psoriasis. Increased levels of proinflammatory cytokines have been found in psoriatic lesions, predominantly of the T helper 1 cell profile. TNF-alpha is one of the most potent proinflammatory cytokine prevalent in psoriatic lesions. TNF-alpha has many effects in the induction of an inflammatory response such as stimulation of adhesion molecules (sE-selectin, sP-selectin, sICAM-1). P-selectin and E-selectin are adhesion molecules which are expressed on the endothelial cells and are responsible for leukocyte recruitment [1,4-6].

Recently, a soluble form of E-selectin (sE-selectin) has been identified and is regarded to be an adequate marker of psoriasis disease activity [7] but this finding needs more modificaton. The present study was undertaken to evaluate sE-selectin and sP-selectin serum levels in psoriatic patients and to correlate sE-selectin and sP-selectin values with the intensity of psoriasis to determine whether these markers could be used as a marker of disease activity in psoriatic individuals.

Patients and Methods

A total of 58 patients with psoriasis (32 men and 26 women, mean age: 37.52±16.8 yr) participated in this study. The serum levels of P-selectin and E-selectin were determined using ELISA method using a commercially available kit (Diaclone,France). Severity of psoriasis was assessed using the Psoriasis Area and Severity Index (PASI) score (median 19.69; range 0.9-55.8). Mean duration of the disease was 6.5 year. Our

control group consisted of 24 healthy individuals (10 men and 14 women, mean age: 52.67± 16.24). None of the patients or control subjects had received topical or oral medications during the 2 months before the study. By using Fisher's exact test and Chi-square, we found no significant difference between cases and controls in the following parameters: history of smoking, alcohol consumption, hypertension, diabetes, hyperlipidemia and BMI score. Differences in patients with psoriasis and controls were analyzed by the Mann-Whitney U-test and T-test. The correlation between the clinical scores and parameters were calculated by Pearson's correlation coefficient. P-value <0.05 was considered statistically significant.

The study was conducted according to the principles of the declaration of Helsinki and was approved by the Medical Ethics Review Board of the Skin Research Center of Shahid Beheshti University of Medical Science. An informed written consent was obtained from each participant.

Results

The average serum level of sE-selectin in psoriatic patients was 34.63 ng/mL; but was not significantly different (P-value: 0.240) from the values in healthy individuals (24.93 ng/mL). A significant positive correlation (R = 0.302, P=0.02) was demonstrated between sE-selectin serum levels and PASI scores. The average serum level of sP-selectin in psoriatic patients was 213.78 ng/mL which was not significantly higher than healthy individuals (359.25 ng/mL). There was no significant correlation between sP-selectin values and PASI score.

Discussion

Chronic T-cell stimulation by still unknown antigens is mediated by antigen presenting cells (APCs) in psoriasis lesions [8,9]. Upon capture of the antigen, APCs mature and migrate to the skin-draining lymph nodes where they can activate antigen-specific naive T-cells. TNF-alpha released by T-cells is one of the most potent proinflammatory cytokines (inciting agents for the disease) prevalent in psoriatic lesions [10-14]. TNF-alpha has many effects in the induction of an inflammatory response such as stimulating production of pro-inflammatory chemokine and adhesion molecules (e.g. sE-selectin, sP-selectin, sICAM-1). Leukocyte adhesion molecules play a major role in cutaneous inflammatory events by directing leukocyte trafficking and also by their impact on antigen presentation. Skin biopsies taken from psoriatic lesions revealed up-regulation of endothelial cell expression of P-selectin and E-selectin [1,4-7].

A number of studies have reported increased serum levels of soluble E selectin (sE-selectin) in psoriatic patients compared to healthy controls [1,7,15]. Elevated levels of E-selectin were also observed in our study, but were of no statistical significance. Szepietowski et al [7] found a correlation between disease activity and sE-selectin although this finding was negated by Czech et al[15]. In contrast to the Borska et al [1] and Tamagava-Mineoka et al [16], sP-selectin level was not increased in our patients and there was no correlation between this marker and disease activity. These contradictory results signify the complex pathogenesis of psoriasis and emphasize the fact that more studies are necessary to make a definite conclusion.

Some limitation exist in this study: 1) the average age of our control group was almost 15 years higher than the patients and 2) we did not measure serum sE-selectin and sP-selectin after therapy.

In conclusion, serum levels of sE-selectin could be used as a marker of disease activity but this finding needs further modification.

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