Total Serum IgE concentration in Patients with Psoriasis: a Case-Control Study

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Abstract- Psoriasis is a chronic relapsing disorder that involves the skin, nails and joints. With regard to the role of the immune system in psoriasis, the current study compared serum IgE concentration in patients with psoriasis with control group. Current case-control study was conducted in Dermatology clinic of Razi hospital, Tehran University of medical sciences, Tehran, Iran in 2012. Fifty-eight patients with psoriasis e referred to the clinic were assigned as patient group and 58 healthy subjects with matched age and sex as a control group. Patient's history, family history and demographic characteristics such as age and sex, duration and severity of disease using PASI, were collected and entered into a form. Consent form was obtained from participants. Serum IgE concentrations of both study groups were measured by electrochemiluminescence assay in the laboratory A total number of 58 patients with psoriasis, mean age of 44.15 (19-76 years) and 58 controls with matched age and sex were studied. Mean average of serum IgE concentration in the control group was 115.13 versus 200/06 concentration in patients group (P=0.16). Serum IgE concentration in 22.4% of patients versus 17.2% in controls was greater than normal concentration (P=0.48). No significant correlation was between serum IgE concentration and disease severity using PASI (P= 0.11, r = 0.21), neither a significant correlation with disease duration, age and gender. According to the present study, serum IgE concentrations are not greater in patients with psoriasis. IgE concentration is also not associated with the severity of psoriasis based on the PASI score, therefore, the role of IgE in psoriasis can be considered insignificant as some previous studies indicate.

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Introduction

Psoriasis is a common skin disorder that is characterized by inflammation and abnormal epidermal proliferation (1). There is considerable evidence that indicates psoriasis is a T cell driven disorder and activated T cells has been found in plaques of psoriasis (2,3). Activated T cells can lead to secretion of two different sets of cytokines, those are stimulating the inflammatory response (Th1cytokines), and those regulate the release of Th2 cytokines that promote immunoglobulin E-mediated inflammatory reactions. In psoriasis, activated memory T cells primarily cause release of inflammatory Th1 cytokines, which leads to accelerated proliferation of keratinocytes in psoriasis lesions' (4).

Serum IgE concentrations are low in normal individuals, but they increase in atopy, parasitic infections, human immune deficiency virus infection and some types of cancers. An increased serum IgE concentration has been found in patients with systemic lupus erythematosis, allergic contact dermatitis and alopecia areata (2). Previous reports indicate different findings in patients with psoriasis, some studies reported higher concentrations of serum IgE in patients with psoriasis (2,5-9), and other studies showed no difference between serum IgE concentrations in patients with psoriasis and control subjects (11-13).

Studies regarding immunological changes and serum IgE in psoriasis, show conflicting results. Current study measured serum IgE concentration in patients with psoriasis and control subjects. The authors compared association of psoriasis severity with serum concentrations of IgE using psoriasis area severity index (PASI). The authors also evaluated the impact of serum IgE concentration in the pathogenesis of psoriasis.

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Materials and Methods

Patients and controls

Present case-control study was conducted in Dermatology clinic of Razi hospital, Tehran University of medical sciences, Tehran, Iran in 2012. Patients with psoriasis referred to the clinic were assigned as patient group. Subjects referred to the laboratory of Razi hospital, with no history of psoriasis, atopic dermatitis, allergic and parasitic diseases were assigned as control group. Patients with a history of taking topical or systemic corticosteroids in the past month and participants with no laboratory follow-up were excluded from the study. Finally, 58 participants with psoriasis 33 females and 25 males (aged 19-76 years) were assigned as case or patients' group and 58 healthy subjects with matched age and sex as a control group.

Demographic characteristics and serum immunoglobulin E concentrations

Patient's history, family history and demographic characteristics such as age and gender, duration and severity of disease using PASI (Psoriasis Area and Severity Index) were collected in a form Consent form was obtained from participants. Serum IgE concentrations were measured by electrochemiluminescence assay (normal range (0-200 IU/ml)). All tests were performed in a laboratory using Roche kit.

Data analysis

Data collected from patients', and controls' groups were entered into statistical software SPSS V.18. Descriptive analysis was performed to measure frequency, mean and standard deviation. Chi–square test used for gender variable and T-test used for age, duration of disease, and serum IgE concentrations variables of both groups. Correlation coefficient was used for determining association between age and PASI score. Statistical significance was considered less than 0.05.

Ethical considerations

Participants enrolled in the study after explaining the project and obtaining informed consent, Subjects were allowed to withdraw from the study. Nobody imposed any costs for preparing laboratory specimens and data. Participants who were not good candidates for blood sampling were excluded.

Results

Patients' mean age was 44.15years (SD=14.82). Mean age of the control group was 45.57years (SD=15.37). No significant statistical difference was between two groups (PASI 0.615). The two groups had no significant difference in gender (P=0.353). Psoriasis's duration varied from 6 months to 60 years (average 10/38 years).

Mean serum IgE concentrations in control groupwas 115/13 IU / ml (from 1to 1500 IU/ml) versus 200/60 IU / ml (from 3 to 2500 IU/ml) in patient group. No significant relationship was between two groups (P=0.16) (Figure 1).

With regard to the normal concentration of IgE in the human body, participants were divided into two groups: a group with normal serum IgE concentration and a group with abnormal concentration. Patients had 22/4% higher than normal serum IgE concentration and controls had 17/2%. No significant difference was between two groups (P= 0.48) (Figure 2).

PASI of patients was 0.7- 38 with a mean of 7.33. Statistically significant correlation between IgE concentration and disease severity using PASI score did not achieve, (P=0.11, r=0.21) neither significant relationship between IgE level and disease duration (P=0.46) or age (P=0.6) or gender of the patients (P=0.99) (Figure 3).

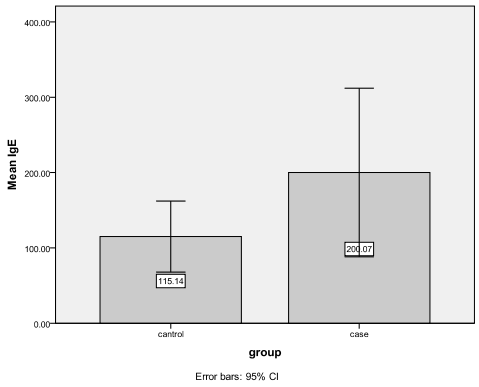

Figure 1. Serum IgE level in cases and controls (In IU/ml)

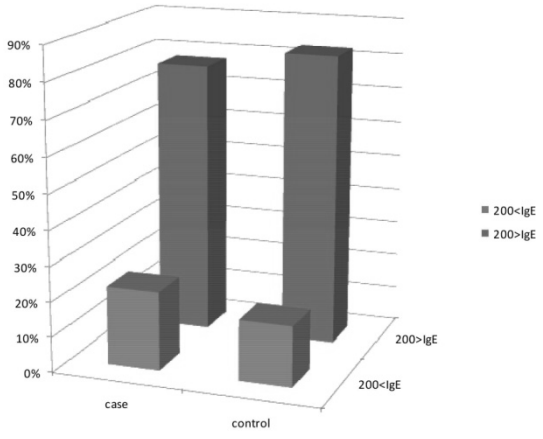

Figure 2. Comparison of IgE level higher than normal in

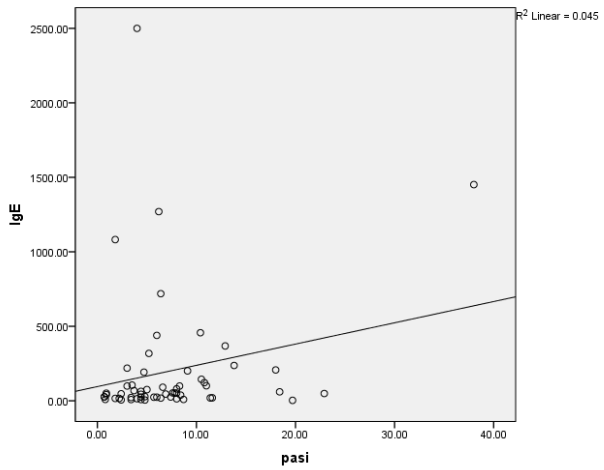

Figure 3. IgE distribution according to disease severity (PASI)

Discussion

Psoriasis may be because of disturbance of the immune system (adaptive T cells) and function of epidermal cell's innate immune system so we can call it an inflammatory disease of the epithelium (1). Causes of the activation of the immune system are infectious or noninfectious antigens that may be unknown to the skin. (14) Presentation of these antigens leads to activation of T lymphocytes, which can be, Th1 or Th2 type. T lymphocytes within the epidermis are the stimulator of keratinocytes' hyperproliferations. Cascade of cytokines secreted by different cells in the skin of patients may have a major role in the disease phenotype (15). Various humoral changes in the skin of psoriatic patients are reported, especially in those with severe disease. High serum concentrations of IgA, IgG and salivary IgA, even anti-nuclear antibodies, are reported (16,17).

Possible association of serum IgE concentration and psoriasis is reported in some studies (5-7), but the finding of IgE concentrations in psoriasis varies widely in different studies. In the current study, increased serum IgE concentrations in patients (22/4% versus 17/2% in controls) were observed, but this increase was not statistically significant consistent with several studies that had similar results (16,10-13). This is somewhat inconsistent with studies, that generally emphasize on a significant relationship between these serum IgE level and psoriasis (1,8-9).

Present study indicated no significant relationship between serum IgE concentration and disease severity (based on PASI score). A study in 2012, reported a higher concentration of serum IgE in patients with psoriasis and no statistical relationship between serum IgE concentrations and psoriasis severity (18). Another study that found the higher concentration of serum IgE concentration in patients with psoriasis than the normal population, however reported a higher concentration of serum IgE in more severe cases, it is worth mentioning in the latter study the PASI were not used to assess disease severity (1).

Psoriasis is speculated as a Th1-predominant disease; therefore patients are not expected to have higher concentrations of IgE than the general population (16, 10-13). Because of reports of increasing the concentration of IgE in some skin diseases such as erythroderma (1,19,20), it is somewhat expected to have a higher serum IgE concentration in some types of psoriasis associated with erythroderma. Moreover, Th1 to Th2 shift in T lymphocytes exposed to an antigen, can also cause increased serum IgE concentration in some patients, but is unlikely to remain sustained in the long-term period. Most patients are estimated to have serum IgE levels consistent with normal population. The lack of correlation between serum IgE level and severity of disease based on PASI could be explained by that the results of studies show the relationship between serum IgE levels and disease severity (1,19,20) may due to selection of patients with psoriasis erythroderma, not because of their severity of the disease.

Results of the current study do not indicate an association between serum level of IgE and severity of psoriasis based on the PASI score and also we do not expect significantly elevated serum level of IgE in patients with psoriasis. Consistent with previous studies, the present study confirms predominance of Th1 to Th2 in the pathogenesis of psoriasis that justifies the lack of a meaningful increase in serum IgE level in psoriasis.

References

1. Ovcina-Kurtovic N, Kasumagic-Halilovic E. Serum Levels of Total Immunoglobulin E in Patients with Psoriasis: Relationship with Clinical Type of Disease. Med Arh 2010;64(1):28-9.
2. Detmar M, Brown LF, Claffey KP, et al. Overexpression of vascular permeability factor/vascular endothelial growth factor and its receptors in psoriasis. J Exp Med 1994;180(3):1141-6.
3. Schlaak JF, Buslau M, Jochum W, et al. T cells involved in psoriasis vulgaris belong to the Th1 subset. J Invest Dermatol 1994;102(2):145-9.
4. Charlesworth EN. Immunomodulation in dermatology: Lessons learned in the treatment of psoriasis. Dermatologic Immunology. Allergy Asthma Proc 2006;27(2):123–5.

5. Negosanti M, Fanti PA, Gasponi A, et al. IgE serum concentrations in psoriasis. Dermatológica 1981;163(6):474-5.
6. Przybilla B, Ring J, Volk M. Total IgE concentrations in the serum in dermatologic diseases. Hautarzt 1986;37(2):77-82.
7. Pigatto PD. Atopy and contact sensitization in psoriasis. Acta Derm Venereol Suppl (Stockh) 2000;211(Suppl):19-20.
8. Chen ZY, Ainsworth SK, Khan T, et al. Immunoglobulin E in psoriasis evaluated by paper radioimmunosorbent and paper enzyme-immunosorbent tests. Acta Derm Venereol 1985;65(1):14-8.
9. Li LF, Sujan SA, Yang H, et al. Serum immunoglobulins in psoriatic erythroderma. Clin Exp Dermatol 2005;30(2):125-7.
10. Arslanagic N. Serumski imunoglobulini kod oboljelih od psorijaze.Med Arhiv1988;42(4):187-92.
11. Gebhardt M, Wenzel HC, Hipler UC, et al. Monitoring ofserologic immune parameters in inflammatoryskin diseases. Allergy 1997;52(11):1087-94.
12. .Weigl BA. The significance of stress hormones (glucocorticoids, catecholamines) for eruptions and spontaneous remission phases in psoriasis. Int J Dermatol 2000;39(9):678-88.
13. .Michaelsson G, Kraaz W, Gerden B, et al. Patients with psoriasis have elevated s of serum eosinophil cationic protein and increased numbers of EG2 positive eosinophils in the duodenal stroma. Br J Dermatol 1996;135(3):371–8.
14. .Lee MR, Cooper AJ. Immunopathogenesis of Psoriasissis. Aust J Dermatol 2006;47(3):151-9.
15. Ghosh N, Kumar V. Novel immunobiology for psoriasis. Indian J Pharmacol 2008;40(3):95-102
16. Guilhou JJ, Clot J, Meynadier J, et al. Immunological aspects of psoriasis. Br J Dermatol 1976;94(5):501-7.
17. Kulick KB, Mogavero H Jr, Provost TT, et al. Serologic studies in patients with lupus erythematosus and psoriasis. J Am Acad Dermatol 1983;8(5):631-4.
18. Del Puerto C, De la Cruz C, Avello E. Psoriasis and IgE plasma levels: Lack of correlation with disease severity. J Am Acad Dermatol 2012;66(4 Suppl 1):AB199.
19. Hasan T, Jansen CT. Erythroderma: a follow-up of fifty cases. J Am Acad Dermatol 1983;8(6):836-40.
20. Frenk E, Gueissaz F, Vion B. Senile erythroderma with serum hyper-IgE. Dermatologica 1991;183(1):72-3.