Original Article

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# Assessment of Inflammatory Markers in Psoriatic Patients

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## Abstract

**Background:** Assessment of level of inflammatory markers in psoriatic patients. **Subjects and Methods:** Seventy- five psoriatic patients of either genders was selected and were divided according to PASI score into three groups (mild, moderate, and severe) each containing 25 patients. Twenty- five healthy subjects of age and sex matched were included as control. Correlations of ADA, hsCRP, SUA, and ESR with PASI scores were done. **Results:** There were 15 males and 10 females I mild group, 12 males and 13 females in moderate group, 14 males and 11 females in severe group and 13 males and 12 females in control group. The mean ADA level was 21.5 U/L in group I and 9.4 U/L in group II. The mean hsCRP level was 54.8 ng/ml in group I and 10.2 ng/ml in group II. The mean SUA level was 5.4 mg/dl in group I and 4.1 mg/dl in group II. ESR level was 28.6 mm/h in group I and 13.9 mm/h in group II. The difference was significant (P< 0.05). No significant correlation between PASI score and ADA, hsCRP, SUA, and ESR was found (P> 0.05). **Conclusion:** Serum ADA, hsCRP, SUA, and ESR showed higher levels among psoriatic patients than healthy controls.

**Keywords:** Psoriasis, C-reactive protein, PASI, ESR

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## Introduction

Psoriasis is a chronic systemic disease with an immune-inflammatory etiology, affecting approximately 2%–3% of the world's population, and characterized by T-cell-mediated hyperproliferation of keratinocytes.[1]

Psoriasis affects both males and females, with earlier onset in females and those with a family history. Its age of onset shows a bimodal distribution with peaks at 30–39 years and 60–69 years in men, and 10 years earlier in women.[2]

Psoriasis manifests in several ways: plaque, flexural, guttate, pustular or erythrodermic psoriasis. The most common form is plaque psoriasis, which presents as well-demarcated salmon pink plaques with silvery-white scale, typically in a symmetrical distribution and affecting the extensor surfaces (especially elbows and knees), trunk and scalp.[3]

C-reactive protein (CRP) is an important laboratory parameter for tissue damage, infection, and inflammation.[4] High-sensitive CRP (hsCRP) can detect lower levels of CRP than the standard CRP measurement. Increased hsCRP is found in many skin diseases including allergic contact dermatitis, mycosis fungoides, hidradenitis suppurativa, and psoriasis. Increased CRP in psoriatic patients was correlated with active arthritis, psoriasis area severity index (PASI) score, and with an increased.[5] Erythrocyte sedimentation rate (ESR) increases with the severity of psoriasis pointing out the chronic inflammatory nature. It was found as a strong predictor for the presence of psoriatic arthritis (PsA).[6] The present study was conducted to assess inflammatory markers in psoriatic patients.

## Subjects and Methods

A sum total of seventy- five psoriatic patients of either genders was selected for this prospective, observational study. All selected patients agreed to participate in the study. Ethical approval was taken before starting the study.

Demographic data such as name, age, gender etc. was recorded. Patients were divided according to PASI score into three groups (mild, moderate, and severe) each containing 25 patients. Twenty- five healthy subjects of age and sex matched were included as control.

8 ml venous blood sample was withdrawn in a test tube. One milliliter added to tube containing K2EDTA for complete blood count (CBC) and 1.6 ml blood was added to sodium citrated tube for ESR determination. The rest of the blood sample was allowed to clot for 15 min, centrifuged, and the serum was separated into two aliquots; one used for determination of SUA, and the other was stored at −20°C for assay of both ADA and hsCRP. Correlations of ADA, hsCRP, SUA, and ESR with PASI scores were done. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

## Results

**Table 1: Distribution of patients**

| Groups | Mild | Moderate | Severe | Control |
|---|---|---|---|---|
| M:F | 15:10 | 12:13 | 14:11 | 13:12 |

There were 15 males and 10 females I mild group, 12 males and 13 females in moderate group, 14 males and 11 females in severe group and 13 males and 12 females in control group [Table 1].

**Table 2: Assessment of inflammatory markers**

| Markers | Group I | Group II | P value |
|---|---|---|---|
| ADA (U/L) | 21.5 | 9.4 | 0.01 |
| hsCRP (ng/ml) | 54.8 | 10.2 | 0.01 |
| SUA (mg/dl) | 5.4 | 4.1 | 0.05 |
| ESR (mm/h) | 28.6 | 13.9 | 0.02 |

The mean ADA level was 21.5 U/L in group I and 9.4 U/L in group II. The mean hsCRP level was 54.8 ng/ml in group I and 10.2 ng/ml in group II. The mean SUA level was 5.4 mg/dl in group I and 4.1 mg/dl in group II. ESR level was 28.6 mm/h in group I and 13.9 mm/h in group II. The difference was significant (P< 0.05) [Table 2].

**Table 3: Correlations of psoriasis area severity index score with inflammatory markers**

| Markers | variables | Mild | Moderate | Severe |
|---|---|---|---|---|
| ADA | R | 0.19 | 0.14 | 0.15 |
| | p | 0.43 | 0.52 | 0.57 |
| hsCRP | R | 0.18 | -0.22 | -0.12 |
| | p | 0.47 | 0.35 | 0.65 |
| SUA | R | -0.05 | 0.18 | -0.069 |
| | p | 0.81 | 0.46 | 0.78 |
| ESR | R | 0.37 | 0.20 | 0.048 |
| | p | 0.12 | 0.41 | 0.81 |

No significant correlation between PASI score and ADA, hsCRP, SUA, and ESR was found (P> 0.05) [Table 3].

## Discussion

Psoriasis is a chronic, immune-mediated skin disease that affects approximately 3% of the US population and an estimated 125 million people worldwide.[7] Plaque psoriasis is the most common variant, accounting for more than 80% of the psoriasis cases.[8] Plaque psoriasis is characterized by erythematous scaly patches or plaques that occur commonly on extensor surfaces, but it can also affect the intertriginous areas, palms, soles, and nails. Psoriasis affects men and women equally, and it affects adults more than children.[9] Flexural psoriasis presents without much scaling and may affect the axillae, sub-mammary and genital areas. Guttate psoriasis causes an acute symmetrical eruption of drop-like papules/plaques mainly involving the trunk and limbs, that is classically but not always preceded by streptococcal infection.[10] Patients with guttate psoriasis may later develop plaque psoriasis. In rare cases of severe uncontrolled disease, psoriasis causes a widespread erythematous rash (erythroderma) that is life-threatening due to potential complications including hypothermia, risk of infection, acute kidney injury and high-output cardiac failure.[11] Koebner phenomenon describes the appearance of psoriasis at skin areas affected by trauma. Psoriasis is assessed by the extent of skin involvement (body surface area (BSA)) and the severity of erythema, induration and scaling.[12] In secondary care, validated scores such as Psoriasis Area Severity Index (PASI) and Physician Global Assessment Scale are routinely used along with patient reported outcome measures such as Dermatology Life Quality Index (DLQI).[13] The present study was conducted to assess inflammatory markers in psoriatic patients.

Our results showed that there were 15 males and 10 females I mild group, 12 males and 13 females in moderate group, 14 males and 11 females in severe group and 13 males and 12 females in control group. Moustafa et al.[14] evaluated serum ADA, hsCRP, SUA, and ESR in psoriatic patients and their correlation with PASI score. This study included 60 psoriatic patients divided according to PASI score into three groups (mild, moderate, and severe) each containing 20 patients. PASI score 20 severe. Twenty healthy subjects of matched age and sex were included as control. Serum ADA, hsCRP, SUA, and ESR were evaluated for patients and controls. Correlations of ADA, hsCRP, SUA, and ESR with PASI scores were done. Results: While ADA, hsCRP, SUA, and ESR showed a significant increase in psoriatic patients compared with that of the controls (P0.05) and no correlations with PASI score (P>0.05). The frequency of joint affection increased with increasing severity of psoriasis (5%, 10%, and 25% in mild, moderate, and severe psoriasis, respectively).

Our results showed that the mean ADA level was 21.5 U/L in group I and 9.4 U/L in group II. The mean hsCRP level was 54.8 ng/ml in group I and 10.2 ng/ml in group II. The mean SUA level was 5.4 mg/dl in group I and 4.1 mg/dl in group II. ESR level was 28.6 mm/h in group I and 13.9 mm/h in group II. Kwon et al.[15] assessed association between SUAC and clinical features of psoriasis. The average uric acid concentration of patients with psoriasis was not significantly different from that of the healthy population, for both genders. There was a positive correlation between SUAC and Psoriasis Area and Severity Index (PASI) and BMI in patients with psoriasis. There was no association with age of disease onset, family history of psoriasis, or other laboratory values in either gender. Of the other factors of disease severity, the extent of body surface involvement was correlated with uric acid concentration although there was no significant relationship with activity of individual lesions. The mean PASI and extent of psoriasis were increased in hyperuricaemic compared with normouricaemic patients.

Our results showed that there was no significant correlation between PASI score and ADA, hsCRP, SUA, and ESR (P> 0.05). Bukulmez et al.[16] assessed the significance of serum ADA activity in psoriasis and its relevance to disease activity. ADA activity was determined with an enzymatic method in 25 patients with psoriasis and in 15 healthy subjects. These measurements were repeated for 10 patients after either PUVA or cyclosporin A treatment. Disease activity was estimated by the PASI scoring system. Serum

ADA level was significantly elevated in patients with psoriasis compared to healthy subjects ($p<0.05$). There was a significant decrease in the ADA levels after treatment compared to pre-treatment values in the same patients ($p<0.05$). There was no correlation between ADA levels and PASI scores. These results support the evidence that T cell activation is involved in the pathogenesis of psoriasis and that ADA may be valuable in the assessment of disease activity in psoriasis.
The limitation the study is small sample sizese.

## Conclusion

Authors found that serum ADA, hsCRP, SUA, and ESR showed higher levels among psoriatic patients than healthy controls. The increased ADA in psoriatic patients supported the role of T-cell activation in the pathogenesis of psoriasis.

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