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Original Research Article

ANALYSING HEMATOLOGICAL PARAMETERS AND INFLAMMATION IN PATIENTS WITH PSORIASIS: A RETROSPECTIVE STUDY

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ABSTRACT

Background: Psoriasis is a chronic inflammatory skin condition associated with systemic immune activation and comorbidities, including hematological alterations. Investigating hematological parameters can help understand underlying inflammation and disease severity. **Objective:** This retrospective study aimed to analyze hematological and inflammatory markers in patients with psoriasis attending Medical college and Hospital, Tertiary care centre, Samayapuram, Tiruchirapalli.

Materials and Methods: A total of 420 patients diagnosed with psoriasis between April 2021–November 2022 and June 2024–March 2025 were included. Data on complete blood count (CBC), erythrocyte sedimentation rate (ESR), and C-reactive protein (CRP) were extracted. Parameters were compared across mild, moderate, and severe psoriasis categories based on PASI scores. Statistical analysis was conducted using SPSS version 25.0.

Results: The mean age of participants was 43.6 ± 11.2 years; 58.3% were male. Mean hemoglobin (Hb) was significantly lower in severe psoriasis (11.2 ± 1.5 g/dL) compared to mild cases (13.6 ± 1.1 g/dL; $p < 0.001$). Total leukocyte count (TLC) was elevated in severe cases (10.3 ± 2.1 $\times 10^9$/L) versus mild (7.4 ± 1.6 $\times 10^9$/L; $p = 0.002$). Neutrophil-to-lymphocyte ratio (NLR) increased with disease severity (severe: 4.8 ± 1.3; mild: 2.1 ± 0.9; $p < 0.001$). ESR and CRP levels were elevated in moderate and severe groups (CRP: 12.6 ± 4.2 mg/L in severe, $p < 0.001$). Platelet counts also showed a rising trend with severity.

Conclusion: Psoriasis severity correlates with significant alterations in hematological and inflammatory parameters. Monitoring these markers can aid in assessing systemic inflammation and disease progression.

Keywords: Hematological Parameters, Inflammation, Psoriasis.

INTRODUCTION

Psoriasis is a chronic, immune-mediated skin disorder characterized by erythematous plaques and scaling, affecting approximately 2–3% of the global population.[1] Beyond cutaneous manifestations, psoriasis is increasingly recognized as a systemic disease linked to multiple comorbidities including cardiovascular disease, metabolic syndrome, and systemic inflammation.[2]

Recent studies have highlighted hematological alterations in psoriasis, particularly involving markers such as hemoglobin, leukocyte count, platelet indices, and inflammatory markers like CRP and ESR.[3,4] The neutrophil-to-lymphocyte ratio (NLR) and platelet-to-lymphocyte ratio (PLR) have emerged as potential indicators of inflammation and disease activity.[5]

Despite these insights, there is limited regional data correlating hematological profiles with psoriasis severity, especially in southern India. Additionally, temporal trends spanning different clinical periods have not been comprehensively explored.

The present retrospective study aimed to evaluate hematological and inflammatory parameters in patients with psoriasis treated at Medical college and

Hospital, Tertiary care centre, Samayapuram, Tiruchirapalli. It seeks to correlate these parameters with disease severity and explore their potential as accessible biomarkers for clinical monitoring.

MATERIALS AND METHODS

Study Design and Setting

This was a retrospective observational study conducted at the Department of Dermatology, Medical college and Hospital, Tertiary care centre, Samayapuram, Tiruchirapalli. Data were collected from medical records spanning two durations: April 2021–November 2022 and June 2024–March 2025.

Sample Size and Selection

A total of 420 psoriasis patients were included using purposive sampling. Inclusion criteria involved adult patients aged 18–70 years diagnosed clinically with psoriasis vulgaris. Exclusion criteria included patients with concurrent infections, autoimmune diseases, hematological disorders, or recent steroid/immunosuppressive therapy.

Data Collection

Demographic data (age, gender), disease severity (based on Psoriasis Area and Severity Index [PASI]), and laboratory parameters were retrieved. Laboratory investigations included:

- Hemoglobin (Hb)
- Total leukocyte count (TLC)
- Neutrophil and lymphocyte counts
- Platelet count
- ESR
- CRP
- Derived indices: NLR and PLR

Statistical Analysis

Data were analyzed using SPSS v25.0. Continuous variables were expressed as mean ± SD. ANOVA and post-hoc tests were used for comparing hematological parameters across severity groups (mild, moderate, severe). A p-value <0.05 was considered statistically significant.

RESULTS

Demographics and Clinical Profile

Among the 420 patients, 245 (58.3%) were male and 175 (41.7%) female. Mean age was 43.6 ± 11.2 years. Disease severity distribution was as follows: mild (n = 152, 36.2%), moderate (n = 178, 42.4%), and severe (n = 90, 21.4%).

Table 1: Hematological and Inflammatory Parameters

Parameter	Mild (n=152)	Moderate (n=178)	Severe (n=90)	p-value
Hemoglobin (g/dL)	13.6 ± 1.1	12.4 ± 1.3	11.2 ± 1.5	<0.001
TLC (×10⁹/L)	7.4 ± 1.6	8.5 ± 1.8	10.3 ± 2.1	0.002
Neutrophil (%)	61.1 ± 6.4	66.8 ± 7.2	72.3 ± 8.0	<0.001
Lymphocyte (%)	30.8 ± 5.3	25.5 ± 4.9	19.6 ± 4.2	<0.001
NLR	2.1 ± 0.9	3.6 ± 1.2	4.8 ± 1.3	<0.001
Platelet Count (×10⁹/L)	271.5 ± 42.1	294.2 ± 49.6	317.6 ± 54.3	0.006
ESR (mm/hr)	17.4 ± 7.2	25.9 ± 8.1	35.3 ± 9.6	<0.001
CRP (mg/L)	6.8 ± 2.7	9.5 ± 3.4	12.6 ± 4.2	<0.001

Significant differences were observed across all parameters, with inflammatory markers and derived ratios increasing with disease severity.

DISCUSSION

The current study observed a significant correlation between psoriasis severity and hematological/inflammatory parameters, notably decreased hemoglobin and increased TLC, NLR, ESR, and CRP.

Lower hemoglobin levels in severe psoriasis may reflect chronic inflammation and the anemia of chronic disease, corroborating earlier findings by Saleh et al.[6] Elevated leukocyte and neutrophil counts indicate active systemic inflammation, consistent with results from Kocabas et al.[7]

Our study also supports the utility of NLR as a sensitive marker of disease activity. A study by Kim et al. showed that NLR significantly correlated with PASI scores and systemic inflammation in psoriatic patients.[8] Similarly, the progressive elevation of CRP and ESR with increasing disease severity aligns with findings by Liew et al,[9] who emphasized the role of CRP in monitoring psoriatic flares.

Platelet count, often elevated due to inflammation-induced thrombopoiesis, was significantly higher in our moderate and severe groups. This complements the results of Uysal et al., who noted similar hematological changes in active psoriasis.[10-15]

These findings reinforce the concept of psoriasis as a systemic inflammatory disorder and highlight the role of simple hematological indices in disease assessment.

CONCLUSION

This retrospective study demonstrates that hematological and inflammatory parameters, including Hb, TLC, NLR, ESR, and CRP, significantly correlate with psoriasis severity. Routine evaluation of these markers may aid in the clinical monitoring and prognostication of psoriatic patients. Further prospective studies are warranted to validate their role in therapeutic decision-making.

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