INFLAMMATORY MARKERS IN PSORIATIC DISEASE

FLORINA CLAUDIA NEAGU*, TEODORA ANDRONIC**, RODICA OLTEANU*,**

Summary

Psoriasis is a chronic inflammatory disease, with a strongly expressed immunological component and a wide range of associated comorbidities. The involvement of inflammatory markers in the pathogenesis of the disease has led to increased interest in identifying serum biomarkers that reflect clinical severity and systemic risk.

The present study aims to highlight the correlation between the PASI score and a series of inflammatory markers (ESR, NLR, leukocytes, platelets, eosinophils, basophils) in a group of 55 patients diagnosed with psoriasis vulgaris.

The results of the research indicate a significant association between increased levels of ESR and NLR and moderate/severe forms of the disease. Thus, serum markers of inflammation may represent useful tools in the objective assessment of psoriasis activity and in adjusting therapeutic strategies.

Keywords: *psoriasis vulgaris, inflammatory markers, ESR, NLR, PASI, systemic inflammation.*

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Introduction

Psoriatic disease is a chronic systemic inflammatory condition that, in addition to skin and joint involvement, frequently associates comorbidities such as cardiovascular disease, metabolic syndrome, and psychiatric disorders. In this context, understanding the immunological mechanisms underlying the disease – in particular the activation of the Th17/IL-23 axis and the production of proinflammatory cytokines such as IL-17, TNF-α, and IL-6 – becomes essential for the development of effective and personalized therapeutic strategies [1,4].

Inflammatory markers are essential tools in this approach, with potential for use both in assessing disease severity and in predicting systemic complications and monitoring therapeutic response. These markers include C-reactive protein (CRP), serum amyloid A (SAA), neutrophil/lymphocyte ratio (NLR) [1], as well as a wide range of cytokines, chemokines and acute phase proteins [1,2,3,4]. Recent research shows that these molecules not only reflect the inflammatory status, but can also signal cardiovascular or metabolic risk, being involved in processes of atherogenesis, insulin resistance or endothelial dysfunction [5,6,7].

Increasingly, there is a trend towards identifying emerging biomarkers – such as chemerin, osteopontin, fetuin-A or microRNAs – that can provide a more accurate picture of the inflammatory and metabolic substrate associated with psoriasis [5,6,7]. These new research directions open up relevant perspectives for an integrated approach to the disease, allowing both better targeted therapeutic interventions and an effective prevention of associated comorbidities. The integration of these markers into complex clinical algorithms could radically transform the way the disease is assessed and managed in dermatological practice [8].

* Titu Maiorescu University, Bucharest.
** Dermatology Clinic 2, Colentina Clinical Hospital, Bucharest.

Research methodology

To investigate the correlation between serum inflammatory markers and psoriasis severity, the study was built on an observational, cross-sectional approach with an analytical component, carried out within a dermatology department of a university hospital. The research aimed to identify significant relationships between common biological parameters and the clinical status of patients diagnosed with psoriasis vulgaris. A rigorous methodology for the selection, processing and interpretation of clinical and paraclinical data was used, with an emphasis on the clinical relevance and applicability of the results in medical practice.

The study sample consisted of 55 patients diagnosed with moderate-severe psoriasis vulgaris (PASI over 10, according to the inclusion criteria for biological therapy in Romania), consecutively selected during the period established for monitoring inflammatory markers: 2022-2024. The diagnosis was confirmed clinically and histopathological. Patients were initiated on anti-IL 17 and anti-IL23 therapy (depending on the patient profile) and assessments were performed at 3 and 6 months according to the national protocol.

The inclusion criteria were: patients over 18 years of age, with moderate-severe psoriasis vulgaris, without acute intercurrent conditions or recent systemic treatments that would significantly influence inflammatory markers.

Exclusion criteria included patients with other concomitant inflammatory diseases, autoimmune diseases, oncological diseases, acute infections or immunosuppressive treatments in recent weeks, to reduce the risk of bias and ensure the homogeneity of the study group.

Blood samples were collected for each patient to determine routine inflammatory markers, such as: erythrocyte sedimentation rate (ESR), neutrophil/lymphocyte ratio (NLR), absolute leukocyte count, platelets, eosinophils, basophils and monocytes (which are also part of the Biological Therapy Administration Protocol). The values obtained were correlated with the severity of the disease, clinically assessed by the PASI score (Psoriasis Area and Severity Index), considered the reference standard in assessing psoriasis activity. Clinical data were supplemented with information on disease history, comorbidities, age, sex and other relevant factors.

Statistical analysis was performed using SPSS software, using descriptive and inferential methods. Correlation tests (Pearson and Spearman), comparative analyses (t-test for independent samples and Mann–Whitney test), as well as logistic regression and ROC (Receiver Operating Characteristic) analyses were applied to evaluate the predictive value of the selected markers. AUC (Area Under Curve) values were calculated to determine the sensitivity and specificity of the markers in predicting moderate and severe forms of the disease. The statistical significance level was set at $p < 0.05$.

Data analysis and interpretation

First, Pearson correlation analysis was performed in the study, which revealed a statistically significant association between the PASI score at the initiation of therapy and the previous PASI ($r = 0.464$, $p = 0.003$), as well as between the initial PASI and the NLR ($r = 0.292$, $p = 0.031$), suggesting that the neutrophil/lymphocyte ratio may reflect the level of initial skin inflammation. No significant correlations were observed between the current PASI score and the analyzed markers, which may indicate an influence of the treatment on the inflammatory response.

Following the analysis of the relationship between the NLR ratio and the PASI score at the initiation of therapy, a correlation is observed between PASI values and higher NLR values, a statistical correlation ($r = 0.292$, $p = 0.031$). Cases with lower NLR (below 1.2) generally present lower PASI scores, which suggests lower systemic inflammatory activity and less severe clinical forms.

The relationship between neutrophil values and PASI score at the initiation of therapy does not indicate a consistent pattern. PASI scores are randomly distributed across the entire range of neutrophil values, with no clear association between their increase and clinical severity of the

Results

Correlation Matrix

Correlation Matrix

		Scor PASI La inițierea terapiei	Scor PASI precedent	Scor PASI actual	VSH	NLR	Neutrofile	Limfocite
Scor PASI La inițierea terapiei	Pearson's r	—						
	df	—						
	p-value	—						
Scor PASI precedent	Pearson's r	0.464	—					
	df	36	—					
	p-value	0.003	—					
Scor PASI actual	Pearson's r	0.086	0.095	—				
	df	47	36	—				
	p-value	0.559	0.570	—				
VSH	Pearson's r	0.064	-0.085	0.249	—			
	df	50	33	44	—			
	p-value	0.652	0.629	0.095	—			
NLR	Pearson's r	0.292	0.283	-0.118	0.015	—		
	df	53	36	47	50	—		
	p-value	0.031	0.086	0.418	0.913	—		
Neutrofile	Pearson's r	0.148	0.144	0.001	0.157	0.598	—	
	df	53	36	47	50	53	—	
	p-value	0.280	0.388	0.995	0.265	<.001	—	
Limfocite	Pearson's r	-0.199	-0.123	0.126	0.181	-0.527	0.262	—
	df	53	36	47	50	53	53	—
	p-value	0.146	0.463	0.387	0.200	<.001	0.053	—

Figure 1. Correlation between inflammatory markers and PASI score at the time of therapy initiation.

disease. At low and medium neutrophil counts (between 2.5 and 3.3), PASI ranges from low scores to over 20, and in the higher ranges (over 3.3), the same lack of homogeneity is observed.

Following the analysis of the relationship between the NLR ratio and the PASI score at the initiation of therapy, a correlation between PASI values and higher NLR values is observed, a statistical correlation ($r = 0.292$, $p = 0.031$). Cases with lower NLR (below 1.2) generally present lower PASI scores, which suggests lower systemic inflammatory activity and less severe clinical forms.

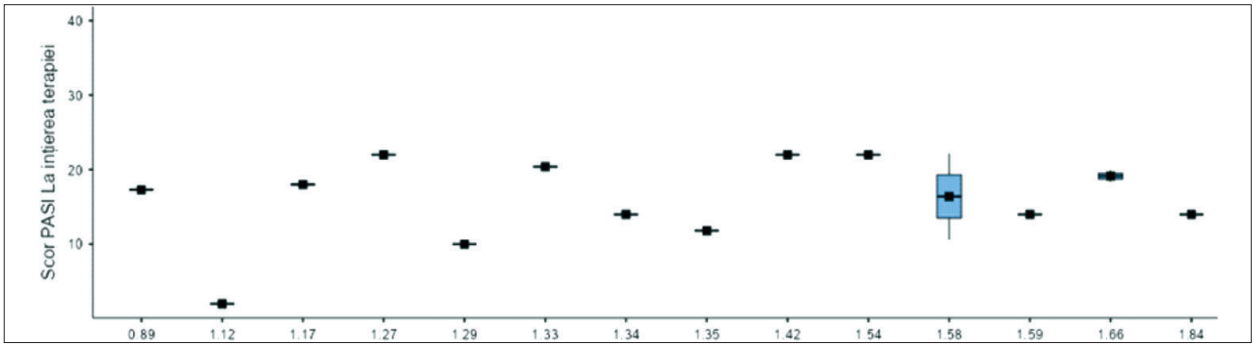

Figure 2. Relationship between NLR ratio and PASI score at the initiation of therapy.

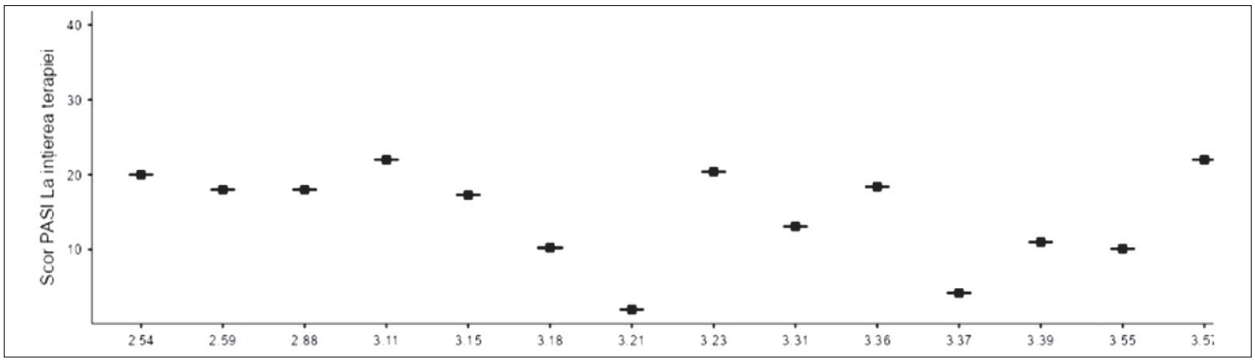

Figure 3. Relationship between Neutrophil ratio and PASI score at initiation of therapy.

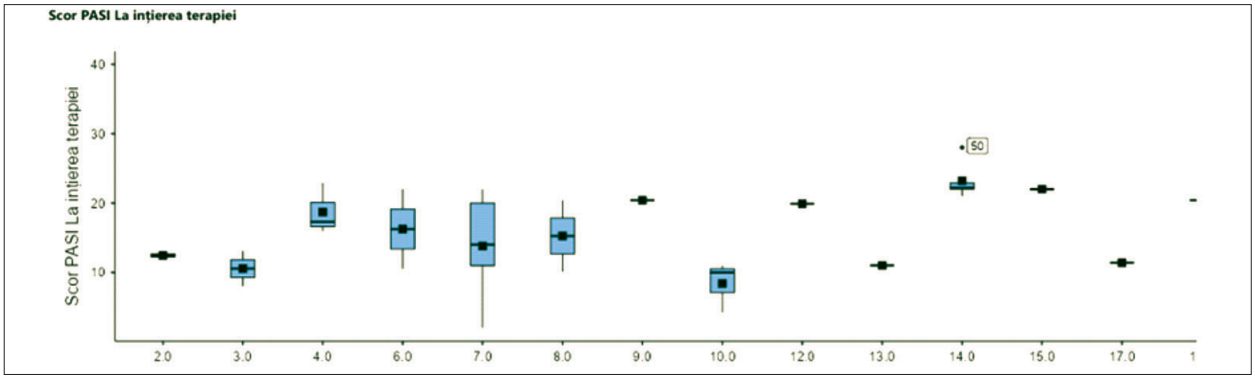

Figure 4. Relationship between ESR and PASI score at initiation of therapy.

Conclusions

The central role of inflammatory markers in the diagnosis and monitoring of psoriasis is highlighted, providing new insights into clinical management. Based on this analysis, the following relevant conclusions can be drawn:

1. Chronic inflammation in psoriasis: Psoriasis is characterized by a disproportionate inflammatory response, dominated by the activation of pro-inflammatory cytokines IL-17, TNF-α, IL-23, IL-22, IL-6 and interferon-gamma (IFN-γ), which contribute to the perpetuation of skin lesions and systemic inflammation. IL-23 plays a central role in the activation and maintenance of Th17 cells, amplifying the production of IL-17 and IL-22, which are directly involved in keratinocyte hyperproliferation [4,8]. In parallel, IL-6 and IFN-γ promote systemic inflammation and the attraction of inflammatory cells to the skin, emphasizing the chronic nature of the disease. Thus, the imbalance of these cytokines is fundamental in the pathogenesis of psoriasis and represents a major target of modern biological therapies.
   Therefore, targeting these proinflammatory cytokines leads to the control of systemic inflammation, relevant by decreasing inflammatory markers.
2. Relevance of inflammatory markers: Inflammatory markers, such as CRP, ESR, and neutrophil/lymphocyte ratio (NLR), play an essential role in assessing disease severity and monitoring clinical progress of patients.
3. Impact of biological therapy: The introduction of IL-17 and IL-23 inhibitors into clinical practice has revolutionized the treatment of psoriasis, demonstrating high

efficacy in reducing inflammation and improving patients' quality of life [4,8].
4. Age-related variations: Inflammatory markers, such as ESR and NLR, show significant variations depending on the age of the patients, reaching maximum values in the middle and advanced age categories, which indicates an intensification of inflammation with the progression of the disease.

The limitations of the study consist in the fact that there was no differentiation of the evolution of inflammatory markers in the two treatment groups taken into the study, as well as the need to increase the follow-up interval of these patients taken into the study.

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Conflict of interest
NONE DECLARED

Correspondance address: Florina Claudia Neagu
Titu Maiorescu University, Bucharest