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ANALYSIS OF THE CLINICAL PROGRESSION CHARACTERISTICS OF THE DISEASE IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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Abstract

Systemic lupus erythematosus (SLE) is a chronic autoimmune disease characterized by heterogeneous clinical manifestations and variable disease progression. This study aimed to analyze the clinical progression characteristics of SLE and evaluate gender-related differences in clinical and immunological profiles. A total of 98 patients fulfilling the American College of Rheumatology classification criteria were included in the study, comprising 78 females and 20 males. Demographic, clinical, and laboratory data were assessed, and disease activity was evaluated using standardized indices. Although the overall number of involved organs did not significantly differ between genders, variations were observed in the pattern of organ involvement. Renal manifestations were significantly more frequent in male patients, while joint involvement was more common among females. Logistic regression analysis demonstrated a significant association between male gender and renal involvement as well as oral ulcer occurrence. Immunological assessment revealed that anti-dsDNA antibodies were the most frequently detected autoantibodies. Anti-SSA and anti-Ro52 antibodies were less common in males, and anti-SSB antibodies were absent in male patients. Renal involvement was associated with higher anti-dsDNA positivity and lower anti-SSA/anti-SSB frequency. These findings indicate notable gender-based differences in clinical manifestations and immunological characteristics, particularly regarding renal involvement, which may influence disease progression and prognosis in SLE patients.

Keywords: systemic lupus erythematosus; clinical progression; renal involvement; autoantibodies; gender differences; disease activity; immunological profile

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Introduction

Systemic lupus erythematosus is a chronic autoimmune inflammatory disorder characterized by the production of autoantibodies directed against nuclear antigens. These autoantibodies, either directly or through immune complex formation, trigger inflammatory processes that result in multisystem organ involvement and variable clinical manifestations [1]. Due to its heterogeneous nature, SLE presents with a broad spectrum of symptoms, ranging from mild mucocutaneous involvement to severe damage affecting renal, cardiovascular, neurological, and hematological systems.

The clinical course of SLE is influenced by a complex interaction of genetic, immunological, hormonal, and environmental factors. It is widely recognized that sex-related differences play a significant role in disease expression. Although SLE predominantly affects females, male patients often demonstrate a more severe disease course and poorer prognosis [2]. Hormonal influences, particularly the effects of sex hormones on immune regulation, are considered important contributors to these differences. Furthermore, ethnic, racial, and socio-economic factors may impact disease severity, clinical presentation, and outcomes [3].

Given the variability in clinical manifestations and disease progression, a comprehensive evaluation of the clinical characteristics of SLE patients remains essential. Understanding the patterns of disease development and progression can improve early diagnosis, optimize management strategies, and contribute to better prognostic assessment [4]. Therefore, this study aims to analyze the clinical progression characteristics of systemic lupus erythematosus in affected patients.

Literature Review

Systemic lupus erythematosus has been extensively studied as a heterogeneous autoimmune disease with variable clinical progression and multisystem involvement. Numerous investigators have emphasized that the clinical course of SLE is characterized by periods of exacerbation and remission, with considerable interindividual variability in severity and organ damage.

According to Tsokos G.C. (2011), SLE represents a prototypic systemic autoimmune disease in which immune dysregulation leads to persistent inflammation and progressive tissue injury. The author highlights that disease progression depends on genetic susceptibility, environmental triggers, and

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abnormalities in both innate and adaptive immunity. Similarly, Rahman A. and Isenberg D.A. (2008) reported that SLE demonstrates a broad clinical spectrum, and its progression is closely associated with cumulative organ damage, particularly renal and neuropsychiatric involvement.

Sex-related differences in disease manifestation and progression have also been widely documented. Tan E.M. et al. (1982) established the clinical and immunological classification criteria for SLE, emphasizing variability in disease expression. Later, Petri M. et al. (2012) updated classification standards and noted that clinical heterogeneity significantly affects disease activity assessment and long-term prognosis. Studies by Lu L.J. et al. (2010) demonstrated that although SLE predominantly affects females, male patients often experience a more severe clinical course and higher rates of organ damage, suggesting differences in disease progression patterns.

Ethnic and geographic variations in clinical manifestations have been reported by Pons-Estel G.J. et al. (2010), who observed that disease severity and organ involvement differ across populations, influenced by genetic background and socio-environmental factors. Furthermore, Bertsias G., Cervera R., and Boumpas D.T. (2012) emphasized that early identification of high-risk patients is crucial for preventing irreversible organ damage and improving disease outcomes.

Longitudinal cohort studies have provided valuable insights into the dynamic nature of SLE progression. Urowitz M.B. et al. (2000) demonstrated that cumulative organ damage increases with disease duration, even in patients receiving standard therapy. Their findings underline the importance of continuous monitoring of disease activity and timely therapeutic intervention to control progression.

Materials and Methods

This study was conducted to evaluate the clinical progression characteristics of patients diagnosed with systemic lupus erythematosus. The research included consecutively selected patients who fulfilled the revised classification criteria of the American College of Rheumatology (ACR) [5]. Patients were recruited over the defined study period from a specialized clinical center, and all participants provided written informed consent prior to enrollment. The study protocol was approved by the institutional ethics committee.

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Study Population

Inclusion criteria comprised: (i) newly diagnosed SLE patients prior to initiation of immunosuppressive therapy; (ii) patients in clinical remission receiving low-dose maintenance therapy (prednisolone ≤10 mg/day and/or hydroxychloroquine ≤200 mg/day); and (iii) patients presenting with active major organ involvement who were evaluated before initiation of high-dose corticosteroids or cytotoxic treatment [6]. Patients with drug-induced lupus or overlap autoimmune syndromes were excluded from the study.

Clinical and Laboratory Assessment

All patients underwent comprehensive demographic, clinical, and laboratory evaluation. Clinical data were obtained through detailed medical history, physical examination, and assessment of disease activity using the Systemic Lupus Erythematosus Disease Activity Index (SLEDAI). Organ involvement was defined according to established SLE classification criteria.

Laboratory investigations included the determination of autoantibody profiles. Autoantibodies against nuclear and extractable nuclear antigens such as anti-dsDNA, anti-Sm, anti-RNP, anti-SSA, anti-SSB, anti-Ro-52, anti-CENP-B, anti-Jo-1, anti-Scl-70, anti-nucleosome, anti-histone, and anti-Rib-P antibodies were analyzed using standardized immunoblot techniques according to the manufacturer's protocol. The presence and titers of autoantibodies were evaluated to determine their association with specific clinical manifestations and disease progression patterns [7].

Statistical Analysis

Statistical analysis was performed using appropriate statistical software. Categorical variables were compared using the Chi-square test or Fisher's exact test when necessary. Continuous variables were analyzed using Student's t-test or the Mann–Whitney U test depending on data distribution. Multivariate analysis was conducted using logistic regression models to identify independent predictors of disease progression [8]. Results were expressed as odds ratios with 95% confidence intervals. Adjustments were made for potential confounding variables including age and sex at the time of evaluation.

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This methodological approach allowed for a comprehensive assessment of clinical progression characteristics and their association with immunological parameters in patients with systemic lupus erythematosus.

Results

A total of 98 patients diagnosed with systemic lupus erythematosus were included in the study, of whom 78 were female and 20 were male. The mean age was comparable between groups, measuring 27.5±7.9 years in females and 27.0±8.0 years in males.

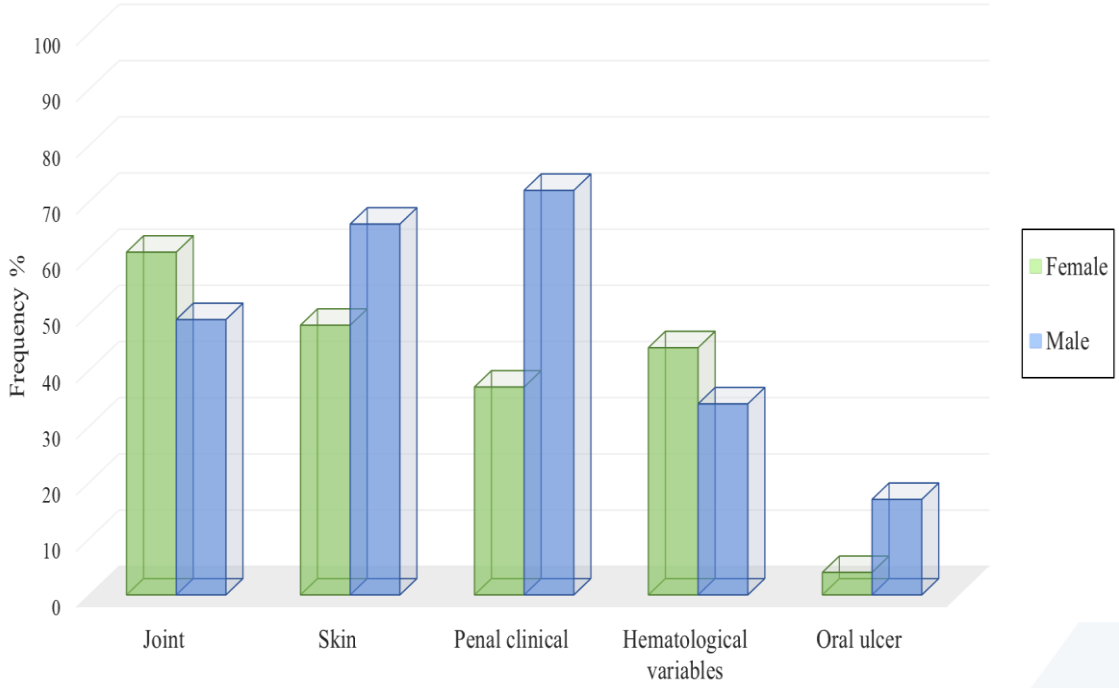

Figure 1. Gender-based differences in clinical manifestations of systemic lupus erythematosus

The average disease duration among males in remission was 4.9±4.1 years, while in females it was 4.3±3.5 years. Regarding place of residence, 41.8% of patients were from rural areas and 58.2% were from urban regions [9]. The analysis demonstrated that although the total number of involved organs did not significantly differ between male and female patients, renal involvement was more frequent in males and joint manifestations were more common in females, as shown in Table 1.

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Table 1. Clinical and demographic characteristics of male and female patients with systemic lupus erythematosus

Clinical variables	Female (%)	Male (%)	OR	95% CI, Lower	95% CI, Upper
Joint involvement	48 (60.8)	9 (47.4)	2.1	0.80	5.8
Skin involvement	36 (45.6)	12 (63.2)	0.74	0.27	2.0
Renal involvement	29 (36.7)	13 (68.4)	0.31	0.11	0.87
Haematological involvement	35 (44.3)	6 (31.6)	2.0	0.70	5.8
Psychiatric involvement	17 (21.5)	2 (10.5)	2.4	0.51	11.7
Oral ulcer	1 (1.3)	3 (15.8)	0.06	0.006	0.7

No statistically significant difference was identified between male and female patients in terms of the total number of organs involved. However, variations were observed in the pattern of clinical manifestations. Renal involvement was the most frequent manifestation among male patients, whereas arthritis was more commonly observed in females [10]. The frequency of kidney involvement was significantly higher in males compared to females (OR=0.31; 95% CI=0.11–0.87). Oral ulcerations were also more prevalent among male patients (OR=0.06; 95% CI=0.006–0.7). The immunological analysis showed that anti-dsDNA was the most frequently detected autoantibody, while anti-SSA and anti-Ro52 antibodies were less common in male patients compared to females, as presented in Table 2.

Table 2. Immunological findings in patients with systemic lupus erythematosus

Variable	Female (%)	Male (%)	P value
Antinuclear antibodies (ANA)	33 (97)	388 (97)	NS
High anti-dsDNA	29 (85)	360 (90)	NS
Anti-Ro (SSA)	5 (14)	82 (20)	NS
Anti-La (SSB)	2 (5)	26 (6)	NS
Anti-U1-snRNP	4 (11)	50 (12)	NS
Anti-Sm	4 (11)	49 (12)	NS
Rheumatoid factor	2 (5)	51 (12)	NS
IgG anticardiolipin antibodies	10 (29)	50 (13)	0.017
IgM anticardiolipin antibodies	6 (18)	34 (9)	NS

Among patients diagnosed with lupus nephritis (n=42), 73.8% exhibited proteinuria greater than 0.5 g/day, 26.2% presented with urinary cellular casts, and nephritis was confirmed by renal biopsy in 42.9% of cases. Patients with

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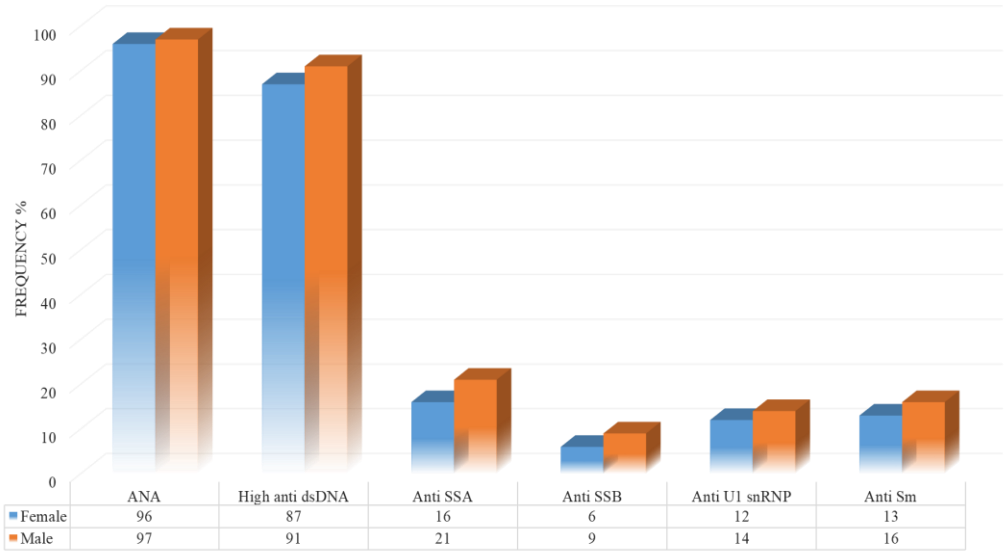
urinary cellular casts were included in the nephritis group following biopsy confirmation or in the presence of concurrent proteinuria.



	ANA	High anti dsDNA	Anti SSA	Anti SSB	Anti U1 snRNP	Anti Sm
Female	96	87	16	6	12	13
Male	97	91	21	9	14	16

Figure 2. Comparative analysis of autoantibody frequency in male and female SLE patients

Immunological assessment demonstrated that anti-dsDNA antibodies were the most frequently detected autoantibodies at the time of sampling. Anti-SSA (OR=3.7; 95% CI=1.1–12.3) and anti-Ro52 (OR=7.3; 95% CI=1.5–34.2) antibodies were significantly less frequent in male patients compared to females, and none of the male patients tested positive for anti-SSB antibodies [11].

In male patients with renal involvement, the prevalence of anti-dsDNA antibodies was significantly higher than in males without renal damage (P=0.009). In contrast, anti-SSA and anti-SSB antibodies were significantly less frequent in males with kidney involvement (P=0.035 and P=0.028, respectively) [12]. Among female patients with renal involvement, anti-SSB antibodies were not detected (OR=0.14; 95% CI=0.01–1.2).

Conclusion

The present study demonstrated that systemic lupus erythematosus exhibits heterogeneous clinical progression patterns with notable gender-related differences in both clinical manifestations and immunological profiles. Although the overall burden of organ involvement did not significantly differ between male and female patients, the pattern of organ damage varied considerably. Renal involvement was significantly more frequent among male patients, whereas joint

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manifestations were more prevalent in females. These findings suggest that gender may influence the clinical course and severity of organ-specific complications in SLE.

Immunological assessment revealed that anti-dsDNA antibodies were the most commonly detected autoantibodies and were strongly associated with renal involvement, particularly in male patients. In contrast, anti-SSA and anti-SSB antibodies were less frequent in males and showed an inverse association with kidney damage. The observed differences in autoantibody distribution highlight the importance of immunological profiling in predicting organ involvement and disease progression.

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