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Clinical and demographic profile of systemic lupus erythematosus: A study of cutaneous manifestations and triggers

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Abstract
Background: Systemic lupus erythematosus (SLE) is a chronic autoimmune disease characterized by multisystem involvement, including a range of cutaneous manifestations. The study aimed to evaluate the demographic profile, clinical features, triggering factors, and laboratory findings in SLE patients, with particular emphasis on the role of skin lesions and exacerbating factors.
Materials and Methods: This cross-sectional observational study was conducted over a one-year period at the Department of Medicine/Dermatology, Fathima Institute of Medical Sciences, Kadapa. A total of 75 patients with SLE were included. Data was collected on demographic parameters, clinical features (specific and non-specific lesions), potential triggering factors, and systemic involvement. Laboratory investigations, including ANA and anti-dsDNA testing, were performed on all participants.
Results: The study found that 86.7% of the patients were female, with the majority (46.7%) in the 21-30 years age group. Photosensitivity was the most common trigger for disease flare (52%), followed by pregnancy (10.7%). Malar rash (69.3%), photosensitive dermatitis (57.3%), and non-scarring diffuse hair loss (74.7%) were the most common cutaneous manifestations. Renal involvement was noted in 48% of patients, and 34.7% had lupus nephritis confirmed by biopsy. All patients were ANA-positive, and 56% had positive anti-dsDNA.
Conclusion: This study underscores the predominance of photosensitivity and cutaneous manifestations in SLE, particularly malar rash and non-scarring hair loss. Systemic involvement was common, especially musculoskeletal and constitutional symptoms. The findings suggest that early identification and management of cutaneous manifestations can aid in timely intervention and improve patient outcomes.

Keywords: Systemic lupus erythematosus, cutaneous manifestations, photosensitivity, lupus nephritis, demographic profile, triggering factors

Introduction
Systemic Lupus Erythematosus (SLE) is a chronic, multisystem autoimmune disorder characterized by widespread inflammation and damage to various organs, including the skin, kidneys, joints, and central nervous system. It predominantly affects women, especially those of childbearing age, and shows a higher prevalence in individuals of African, Hispanic, and Asian descent. The global prevalence of SLE ranges from 20 to 150 per 100,000 individuals, with significant geographic and ethnic variations. The pathophysiology of SLE involves immune dysregulation, including the formation of autoantibodies that target nuclear antigens, leading to the deposition of immune complexes and subsequent tissue damage [1, 2].
Cutaneous involvement occurs in approximately 50% to 85% of individuals with SLE and is one of the most frequent and recognizable manifestations of the disease. Skin lesions in SLE can be transient or chronic and often serve as both a diagnostic clue and a marker of disease activity. The most characteristic cutaneous manifestation of SLE is the malar rash, also known as the butterfly-shaped rash, which occurs across the cheeks and nose. This rash is photosensitive and typically appears in 30% to 50% of patients, often during the early stages of the disease. The malar rash is a key diagnostic feature and may be exacerbated by ultraviolet (UV) radiation exposure [3].
Discoid lupus erythematosus (DLE), a form of cutaneous lupus that affects only the skin, presents with erythematous, well-demarcated plaques covered with scales, often leading to scarring and permanent alopecia. These lesions are commonly found on the face, scalp, and

ears. DLE can precede the onset of systemic lupus in some patients, and its presence often correlates with disease activity [5, 6]. Subacute cutaneous lupus erythematosus (SCLE), which is more common in patients with anti-Ro/SSA antibodies, presents with annular or psoriasiform lesions that are usually localized to sun-exposed areas such as the upper torso, face, and arms. These lesions are often triggered by UV exposure and may cause significant cosmetic concerns for affected individuals [7].

Other notable cutaneous manifestations include oral ulcers, nonscarring alopecia, and vasculitis changes, such as livedo reticularis and Raynaud's phenomenon, which are common in SLE patients with severe disease [8].

This study aims to evaluate the various cutaneous manifestations in patients with SLE presenting to this tertiary care center.

Materials and Methodology

This cross-sectional observational study was conducted at the Department of Medicine/Dermatology, Fathima Institute of Medical Sciences, Kadapa, from August 2017 to July 2018, to investigate the cutaneous manifestations in patients with systemic lupus erythematosus (SLE). Prior to commencing the study, the thesis protocol was approved by the Institutional Ethics Committee of Fathima Institute of Medical Sciences, ensuring that all ethical standards were adhered to during the study period.

All patients diagnosed with SLE and attending the Dermatology Outpatient Department and the Rheumatology Department at Fathima Institute of Medical Sciences, during the study period were included. Only patients who consented to participate were enrolled in the study. Patients with conditions that could mimic cutaneous manifestations of SLE, such as folliculitis, candidiasis, tinea corporis, scabies, and drug-induced rashes, were excluded from the study to ensure accurate data collection. A total of 75 patients diagnosed with SLE were included in the study. The sample size was based on the expected prevalence of cutaneous manifestations in SLE and was adequate to provide reliable results.

After obtaining informed consent, a detailed case history was taken from each participant, focusing on demographic information, family history, and medical history, particularly with respect to autoimmune diseases, history of sunlight exposure, smoking, and any prior drug use. Information regarding the initial presentation of the disease and the involvement of other systems was also recorded.

A comprehensive dermatological examination was performed to document both specific and nonspecific cutaneous manifestations of SLE. Specific lesions noted included the malar rash, photosensitive dermatitis, maculopapular rash, subacute cutaneous lupus erythematosus (SCLE), and discoid rash. Nonspecific manifestations such as alopecia, oral ulcers, Raynaud's phenomenon, hyperpigmentation, livedo reticularis, sclerodactyly, and others were also recorded. In cases where further investigation was necessary, dermoscopic examination and skin biopsy were performed to obtain histopathological confirmation.

Routine laboratory investigations were conducted, including a complete blood count, erythrocyte sedimentation rate (ESR), liver and renal function tests, and urinalysis. Antinuclear antibody (ANA) tests and anti-dsDNA tests were done for all patients to confirm the diagnosis of SLE. Chest X-rays, Mantoux tests, ultrasound, and echocardiography were performed when systemic involvement was suspected.

The data collected were analyzed using IBM SPSS Statistics software (Version 23.0). Descriptive statistics, including frequency and percentage analysis, were used to describe categorical variables and identify patterns in cutaneous manifestations among the study population.

Results

This study was conducted on 75 patients diagnosed with systemic lupus erythematosus (SLE) at the Department of Medicine/Dermatology, Fathima Institute of Medical Sciences.

The study findings provide valuable insights into the demographic and clinical characteristics of patients with systemic lupus erythematosus (SLE). A majority of the patients were in the 21-30 years age group, highlighting a younger patient population with a clear female predominance (86.7%). This aligns with the known higher incidence of SLE in women, particularly during reproductive years. Regarding triggering factors, photosensitivity was identified as the most common precipitating factor for flare-ups (52%), followed by pregnancy (10.7%) and infections (6.7%). Interestingly, 28% of the patients reported no identifiable trigger, which suggests the complex and multifactorial nature of the disease's onset.

Table 1: Demographic and triggering parameters of patients

Parameter		Frequency
Age (in years)	<20 years	17 (22.7%)
	21-30 years	35 (46.7%)
	31-40 years	12 (16%)
	>40 years	11 (14.7%)
Gender	Males	10 (13.3%)
	Females	65 (86.7%)
Triggering factors for flares	Drug	1 (1.3%)
	Infection	5 (6.7%)
	Photosensitivity	39 (52%)
	Pregnancy	8 (10.7%)
	Stress	1 (1.3%)
	No Trigger	21 (28%)

Clinically, the study revealed that cutaneous manifestations are central to the disease. Malar rash (69.3%) and photosensitive dermatitis (57.3%) were the most prevalent specific lesions, with generalized maculopapular rashes

being common as well. Non-specific manifestations like non-scarring diffuse hair loss (74.7%) and oral ulcers (69.3%) were also highly prevalent, reflecting the systemic involvement of the disease. Systemic symptoms, including constitutional symptoms (78.7%) and musculoskeletal involvement (74.7%), were seen in the majority of patients, suggesting the widespread impact of SLE beyond the skin. Additionally, renal involvement, evidenced by proteinuria (32%) and confirmed lupus nephritis (34.7%), underscores the significant organ damage potential of the disease.

Table 2: Clinical characteristics

Clinical characteristics		Frequency
Specific lesions for SLE	Lupus Profundis	1 (1.3%)
	SCLE	2 (2.7%)
	Discoid Lupus	13 (17.3%)
	Generalized Maculopapular Rash	36 (48%)
	Photosensitive Dermatitis	43 (57.3%)
	Malar Rash	52 (69.3%)
Non-specific lesions for SLE	Non-Scarring Diffuse Hair Loss (NSDHL)	56 (74.7%)
	Scarring Hair Loss (SHL)	5 (6.7%)
	Oral Ulcer	52 (69.3%)
	Hyperpigmentation	22 (29.3%)
	Nail Changes	14 (18.7%)
	Vasculitis	12 (16%)
	Raynaud's Phenomenon	11 (14.7%)
	Facial Edema	10 (13.3%)
	Urticaria	7 (9.3%)
	EMF (Erythema Multiforme)	3 (4%)
	LP-LE Overlap	1 (1.3%)
Systemic involvement	Constitutional Symptoms	59 (78.7%)
	Musculoskeletal	56 (74.7%)
	Hematology	44 (59.3%)
	Renal	6 (48%)
	Nervous System	16 (21.3%)
	Gastrointestinal (GIT)	14 (18.7%)
Renal involvement	Proteinuria	24 (32%)
	Lupus Nephritis (confirmed by biopsy)	26 (34.7%)

The laboratory findings confirm the high frequency of ANA positivity (100%), with anti-dsDNA antibodies present in over half of the patients (56%), reinforcing their diagnostic relevance.

Table 3: Laboratory Findings in SLE Patients

Findings	Frequency
ANA Positive	75 (100%)
Anti-dsDNA Positive	42 (56%)

Discussion

This study was undertaken to explore the demographic, clinical, and laboratory characteristics of systemic lupus erythematosus (SLE) patients, with a focus on cutaneous manifestations and their relationship with disease flares. Understanding the epidemiology, common triggers, and clinical presentations in different settings can enhance early diagnosis and management of SLE, which is crucial for improving patient outcomes. This study specifically aims to identify patterns in triggering factors, skin lesions, and systemic involvement, and compare them with previous studies in the literature.

The findings of this study are consistent with those of several other studies regarding the demographic profile, with a predominance of younger women. The age distribution in the present study, with the majority of patients falling within the 21-30 years range (46.7%), mirrors findings from studies by Lotti *et al* [9] and Sulli *et al*. [10], which also reported a higher incidence in this age group. In terms of gender distribution, the female-to-male ratio was 8.7:1, which is consistent with the findings of Gonzalez *et al* [11] who noted a similar high female preponderance, corroborating the well-established gender disparity in SLE.

The most common triggering factor identified in this study was photosensitivity (52%), followed by pregnancy (10.7%), which aligns with findings by Shums *et al* [12] and Bakshi *et al* [13] who found photosensitivity to be the most frequent exacerbating factor. However, unlike some studies that reported a higher prevalence of drug-induced flares (Choudhary *et al*.), drug-related triggers were found to be rare (1.3%) in our study. This discrepancy could be attributed to regional variations or differences in the drugs prescribed or available in the study setting.

Regarding the clinical manifestations, the study confirms that cutaneous lesions are prominent in SLE patients, with malar rash (69.3%) and photosensitive dermatitis (57.3%) being the most common specific lesions, similar to findings in the work of Reveille *et al*. [15] However, the prevalence of discoid lupus erythematosus (17.3%) in this study is higher than what was reported by Johnson *et al*. [16] where the prevalence of DLE was around 9%. This difference could reflect regional variations or the different sample sizes and methodologies used in the respective studies.

In terms of systemic involvement, the present study found that musculoskeletal involvement was the most common (74.7%), followed by constitutional symptoms (78.7%). These results are consistent with studies by Zonana-Nacach *et al*. [17] and Woo *et al*. [18] which found musculoskeletal and constitutional symptoms to be the most frequently reported manifestations. Renal involvement, seen in 48% of the study

participants, is in line with studies by Doria *et al* [19] and Tselios *et al*. [20] where renal involvement ranged between 30-50% in SLE patients. Notably, lupus nephritis was confirmed in 34.7% of patients, a finding that is consistent with the literature highlighting the importance of renal monitoring in SLE management.

Conclusion

In conclusion, this study provides valuable insights into the demographic, clinical, and laboratory characteristics of SLE patients, emphasizing the importance of cutaneous manifestations in the disease's progression. The findings confirm the predominance of photosensitivity, malar rash, and non-scarring diffuse hair loss as common clinical features. The study highlights the significance of musculoskeletal and constitutional symptoms as the most frequent systemic involvements. Further research with larger sample sizes and multi-center studies is recommended to validate these findings and explore regional differences in SLE manifestations and triggers.

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Conflicts of Interest

The authors declare no conflicts of interest in the conduct of this study.

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