http://jmscr.igmpublication.org/home/
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v12i08.15

IGM Publication Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

A Study on Clinical and Immunological pattern of Systemic Lupus Erythematosus patients in a Tertiary care Hospital – A Retrospective Study

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Introduction

Systemic Lupus Erythematosus (SLE) is a Chronic Multisystem Autoimmune disorder that exhibits a wide spectrum of clinical and immunological abnormalities ranging from localized cutaneous involvement to life-threatening systemic involvement. The heterogeneity of SLE manifestations is due to an interplay of genetic, environmental, and hormonal influences[1]. Onset occurs commonly in women of reproductive age, in the third and fourth decades of life, with a Male: Female ratio of about 1:10. The clinical course of the disease is unpredictable with periods of remission and flares.

Multiple organ involvement is common in SLE including the Skin, Joints, Central Nervous System and Kidneys leading to long-term morbidity and mortality [2]. Moreover, Lupus-specific Skin lesions (e.g., Malar rash and Discoid rash) serve primarily as important diagnostic clue, whereas Lupus nonspecific skin lesions (e.g., alopecia and purpura) are associated with more active disease and thus require more aggressive therapy and disease monitoring [3].

The wide spectrum of clinical manifestations in patients with SLE is partially caused by pathogenic autoantibodies. The autoantibodies may potentially target their corresponding autoantigens in the Cell Nuclei, Cytoplasm, Cell-surface membrane, Serum components, Extracellular matrix substances and miscellaneous molecules [3].

Some of these Autoantibodies such as Anti-dsDNA, Antiribosomal P, Anticardiolipin, and Anti-SSB/La are indeed pathogenic as they bind to surface-expressed cross-reactive antigens. These pathogenic autoantibodies not only directly damage the tissues to promote the release of more nuclear antigens, but derail innate and adaptive immune functions. The vicious cycle caused by these pathogenic autoantibodies sustains the chronic immunological and inflammatory abnormalities in patients with SLE[3]. In this study, the Clinical Spectrum of manifestations and Various Systems involved and Immunological pattern in Systemic Lupus Erythematosus patients is studied.

Materials & Methods

The study will be conducted on all patients who presented to General medicine OPD/ Emergency department and those who got admitted in General Medicine department of SMVMCH, with Immunological complaints satisfying inclusion and exclusion criteria as a part of the study.

Inclusion criteria: Adults (Male or Female) who were diagnosed as SLE (Systemic Lupus Erythematosus) inpatients by ACR diagnostic criteria in last 5 years with records of investigations and treatment.

Exclusion criteria: Those patients whose records are not available or incomplete.

The following parameters were studied which includes demographic data, brief history, anthropometric measurements, Various Clinical manifestation, Immunological profile.

Statistical Methods

Data were entered and analysis were done using STATA Software. Data are expressed as the means±standard deviations for normally distributed values, as geometric mean for non-normally distributed values,and as percentages.

Results

During this study period, 56 patients were identified with SLE. The study group comprises of 51 Females (91.1%) and 5 Males(8.9%) with a Female: Male ratio of 51:5. The most Common age group was Third decade Middle Aged Adults (44.6%) and 6 patients were in the First decade. 44 patients had skin manifestations at the time of presentation and 45 patients had Renal Involvement, 2 patients had Pleuritis and 8 patients had Neurological involvement.

Table 1,2: Demographic Characteristics of the study group of 56 SLE Patients

Age	Frequency	Percent
Child	6	10.7
Young Adult	15	26.8
Middle Aged	25	44.6
Old Aged	10	17.9

SEX	Frequency	Percent
Male	5	8.9
Female	51	91.1

Pie Chart 1: SLE specific Cutaneous Lesions

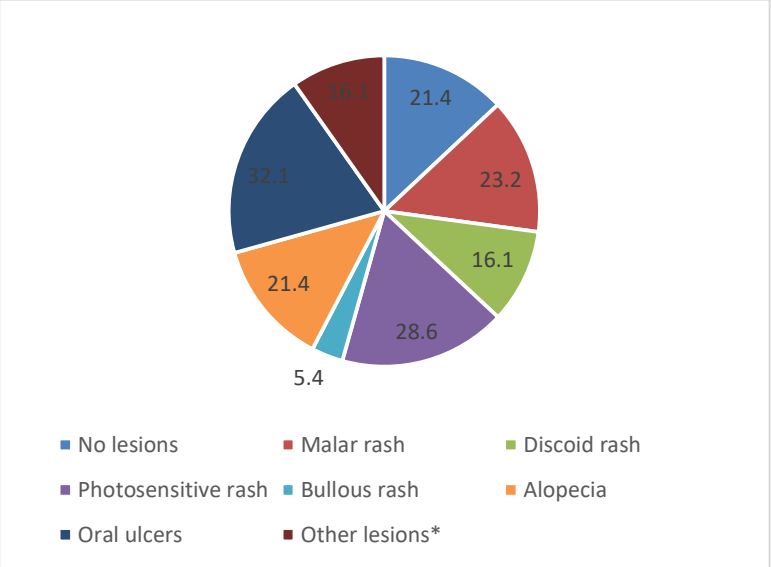
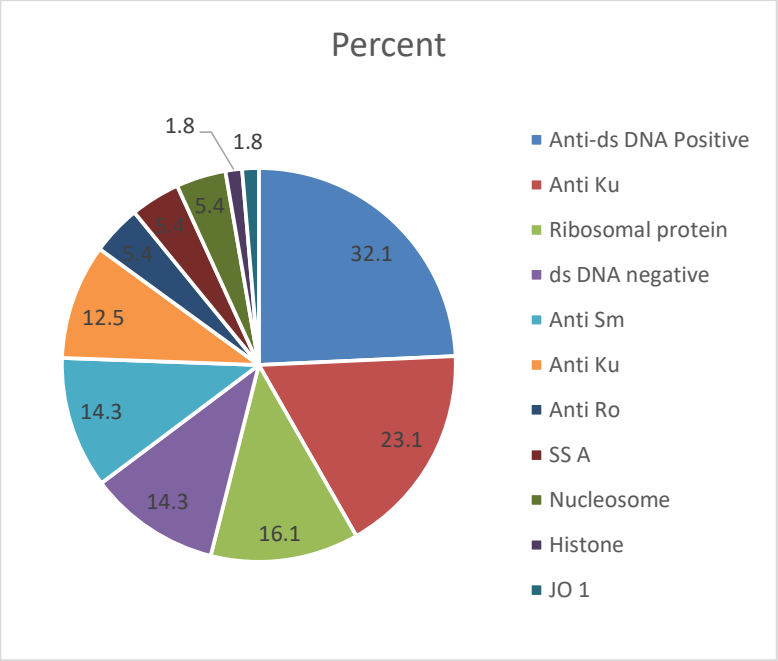


Table 2: Systemic Involvement in 56 SLE Patients

SYSTEMIC INVOLVEMENT	FREQUENCY	PERCENTAGE
Serositis	2	3.6
Renal Involvement	45	80.4
Musculocutaneous	25	44.6
Neuropsychiatry	8	14.3
Hemolytic Anaemia	4	7.1

Pie Chart 2: Autoantibodies profile of 56 SLE Patients



Discussion

In a study involving 56 patients, the mean age of onset for SLE was identified as Middle Aged Adults, with a predominant Female to Male Ratio of 51:5. The most common clinical presentations included Oral Ulcers (32.1%), Photosensitive Rash (28.6%), Malar Rash (23.2%), and Arthritis (41.1%). Fever and Fatigue were prevalent, reported in 66.1% and 48.2% of patients, respectively. Uncommon manifestations such as Discoid Rash (16.1%), Bullous Rash (5.4%), and Myositis (3.6%) were also observed. Complications encompassed Proteinuria (76.8%) and less frequently Hematuria (3.6%), Pleuritis (3.6%), and Recurrent Abortion (3.6%). Laboratory findings revealed Leukopenia (35.7%), Thrombocytopenia (30.4%), Elevated ESR, Elevated Serum Creatinine (14.3%), and Positive Coomb's Test (5.4%). Antinuclear antibody (ANA) patterns varied, with Homogeneous (17.9%), Nuclear Coarse Granular (7.1%), and Cytoplasmic (6%) patterns noted. Autoantibodies included Anti-dsDNA (32.1%), Anti-Ku (23.1%), Ribosomal Protein (16.1%), and Anti-Sm (14.3%). Additionally, associated autoimmune conditions comprised Hypothyroidism (16.1%), Hyperthyroidism (1.8%), and Hemolytic Anemia (7.1%). These findings contribute to a comprehensive understanding of the clinical spectrum, complications, and immunological aspects of the disease, aiding in its diagnosis and management.

In the male subset of the study, comprising 5 patients, notable features include a range of clinical manifestations such as oral ulcers (4 cases), arthritis (2 cases), photosensitive rash (2 cases), pleuritis (1 case), and myositis (1 case). Laboratory findings revealed elevated inflammatory markers with all patients showing elevated ESR, and a significant proportion experiencing leukopenia (3 cases) and thrombocytopenia (2 cases). Renal involvement was observed with all patients exhibiting proteinuria, and

one case demonstrating hemolytic anemia. Immunological investigations indicated a homogenous pattern in antinuclear antibodies (ANAs) for 2 patients, and a positive presence of anti-double-stranded DNA (Anti-dsDNA) antibodies in 3 cases. Additionally, 2 patients had antibodies against ribosomal proteins. The therapeutic approach in this subset involved high-dose steroid treatment for 3 patients.

Approximately 12.5% of the individuals exhibited a very high SLEDAI activity and 26.8% of the population, presented with a high SLEDAI activity.

In the subset of patients with very high activity as indicated by the SLEDAI score (Systemic Lupus Erythematosus Disease Activity Index), involving 7 individuals, the clinical profile is characterized by a constellation of symptoms. Fever (4 cases), headache (3 cases), and fatigue (3 cases) were prominent, along with various other manifestations such as leg swelling (2 cases), arthritis (2 cases), oral ulcers (5 cases), malar rash (2 cases), alopecia (2 cases), photosensitive rash (2 cases), myositis (2 cases), pleuritis (1 case), and proteinuria (7 cases). Hematuria was noted in 2 cases, along with elevated ESR (7 cases) and deranged renal function tests (2 cases). Hematological abnormalities included leukopenia (5 cases) and thrombocytopenia (3 cases). Immunological features comprised a homogenous pattern (3 cases), cytoplasmic pattern (2 cases), and nucleolar pattern (1 case) in antinuclear antibodies (ANAs). Autoantibodies included ribosomal P (2 cases), RNP (1 case), and dsDNA (3 cases). Additionally, all patients exhibited low levels of C3 and C4. Other associated conditions encompassed hypothyroidism (1 case), hemolytic anemia (1 case), and a seizure disorder (1 case). The therapeutic strategy for this high activity subgroup involved high-dose steroid treatment in 5 cases, highlighting the complexity and severity of the disease in these individuals.

In the subset of patients with a high activity SLEDAI score (Systemic Lupus Erythematosus Disease Activity Index), comprising 15 individuals, the clinical presentation is marked by significant disease activity. Prominent symptoms include fever (10 cases), fatigue (9 cases), arthritis (8 cases), oral ulcers (8 cases), and various dermatological manifestations, including malar rash (3 cases), alopecia (5 cases), photosensitive rash (6 cases), discoid rash (2 cases), and bullous rash (2 cases). Gastrointestinal involvement was indicated by hematemesis in one case, and respiratory symptoms such as breathlessness were noted in four cases. Renal involvement included proteinuria (10 cases) and hematuria (1 case), along with elevated ESR (13 cases) and deranged renal function tests (2 cases). Hematological abnormalities comprised leukopenia (2 cases) and thrombocytopenia (5 cases). Immunological features included a variety of ANA patterns, such as homogenous pattern (2 cases), cytoplasmic pattern (2 cases), coarse granular pattern (1 case), and fine granular pattern (1 case). Autoantibodies detected included ribosomal protein (5 cases), RNP (5 cases), dsDNA (5 cases), anti-Ku (4 cases), and anti-Sm (2 cases). Low levels of C3 and C4 were observed in 4 cases. Associated conditions involved hypothyroidism (3 cases), hyperthyroidism (1 case), psychosis (2 cases), hemolytic anemia (2 cases), and rheumatoid arthritis (1 case). The therapeutic approach in this group included high-dose steroid treatment in 9 cases

Conclusion

In contrast to a prior study indicating a lower age at onset and a high prevalence of photosensitivity, anemia, and alopecia in systemic lupus erythematosus (SLE), the current investigation focuses on middle-aged individuals. This cohort exhibits a middle age at onset and presents with a distinctive clinical profile, including a heightened prevalence of oral ulcers, photosensitive rash, leukopenia, thrombocytopenia, and proteinuria. Notably, there is a reduced occurrence of bullous rash and pleuritis. The study identifies associations with autoimmune diseases such as thyroid disorder and hemolytic anemia. The most frequently detected autoantibodies are AntidsDNA and AntiKu. A gender-based comparison reveals that male patients

manifest with high disease activity, experience complications, and receive high-dose steroids. Remarkably, patients treated with high-dose steroids demonstrate a lower incidence of flares, decreased disease activity, and fewer organ-threatening conditions. Furthermore, the study underscores the significance of a positive immunological profile in patients presenting solely with cutaneous involvement. This profile provides caregivers with an opportunity to identify the disease process before systemic manifestations become evident. These findings contribute to a more nuanced understanding of the varied clinical manifestations, treatment outcomes, and prognostic indicators in middle-aged SLE patients.

Limitation of this study includes: Medical Records are not available for some patients and Follow up of the patients can not be done.

Acknowledgement: We acknowledge the Medical Record Department for allowing in getting old records.

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