Clinical, Immunological & Haematological Profile Of Systemic Lupus Erythematous Patients attending Tertiary Care centre : A Cross-Sectional Study

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Abstract

Background & Aims: Systemic lupus erythematous (SLE) is a chronic autoimmune disease which affects females more than males. This study was aimed with the objectives to correlate the patterns and clinical characteristics of Systemic Lupus Erythematous patients. **Materials and Methods**: This was an observational cross-sectional study conducted at a tertiary care centre in Western Odisha. Patients who fulfilled the 1997 ACR (American College of Rheumatology) classification revised criteria of SLE were enrolled in the study from 24/02/19 to 26/2/21. After history & clinical examination these patients were subjected to various diagnostic procedures so as to confirm the diagnosis of SLE. The clinical and immunological profile of all these patients was mapped to have better understanding of the disease pattern. **Results**: *Over a period of 2 years,* a total number of 40 SLE patients were enrolled with a mean age of 30 years. Gender distribution was found to be all female patients. Patients had involvement of various systems like mucocutaneous (70%), renal (67.5%),musculoskeletal (52.5%), neurological(7.5%). The patients were positive for antibodies against dsDNA (47.5%), Ro (42.5%), nRNP (37.5%), nucleosomes (32.5%) followed by ribosomal P-protein (30%), Sm (30%), and histones (25%). **Conclusion**: The observations of present study suggests that SLE patients may present with a wide variety of clinical manifestations. The disease is more common in females especially during the second and third decade of life. Autoantibody profiling aids in supporting diagnosis. Vigilant evaluation of clinical pattern is required to diagnose the disease and for better treatment.

Keywords: Clinical profile, Hematological profile, SLE, SLEDAI, Autoantibody profile

Introduction

SLE is an autoimmune disease in which the body's immune system mistakenly attacks healthy tissue in many parts of the body . A review study conducted in Asia had shown that the prevalence rate of the disease ranges from 30 -50/1,00,000 population. [1] Another study conducted in rural India had shown a very low prevalence rate (3.2/1,00,000) of the populations. [2]

SLE is a disorder with a variety of clinical manifestations, and a profound sex bias, which mostly affects females more than males, but men with lupus show more severe symptoms and worse prognosis .[3] [4] [5] Gender variation is seen due to the role of estrogen in etiopathogenesis of disease which is more common in females of childbearing age group. [6] Although sex hormones are considered to be essential factors for the development of clinical differences and gender bias in SLE, genetic, immunologic, hormonal and environmental factors could also affect the clinical features, disease outcomes and severity of SLE. [7,8,9]

Clinical features of SLE has been described from different geographical regions in the world with some

clinical difference among different racial groups. [10]
Malar rash, arthritis, renal and haematological manifestation were reported in higher proportions among North and West Indian SLE patient. [11,12] In contrast serositis and haematological manifestations were reported to be more frequent among East India patients. [13] Arthritis and haematological manifestations were common in SLE patients from South India. [14]
Autoantibodies found in SLE patients are antinuclear antibody (ANA), anti-ds-DNA antibody, and anti-extractable nuclear antigen (ENA) antibody. Anti-ENA antibodies include anti-smith (Sm), anti-ribonucleoprotein (RNP), anti-Ro and anti-La antibodies. [15]
Inadequate data on correlation of clinical and immunological manifestation create a major barrier to understand the disease SLE.
A lot of studies are being conducted to assess the clinical and immunological manifestation of SLE ; so the current study is being conducted with an objectives 1) To determine the clinical , immunological and haematological features in SLE patients attending tertiary care set-up of western Odisha . 2) To compare the features with National data on SLE patients.

Material & Methods

It was a hospital based , cross sectional study conducted at VSS institute of medical science college & Research, Burla of western Odisha for a period of 2 years i.e (24/02/2019 to 26/2/2021)
The 1997ACR (American College of Rheumatology) classification revised criteria of SLE was taken to diagnose patient as it is the most acceptable one.Patients who fulfilled this criteria were included in the study. So total 40 patients diagnosed with Systemic Lupus Erythematosus (SLE) both from OPD & IPD during the period from 24/02/19 to 26/2/21 form the study group.
We collected the detailed information of all the SLE patients. Clinical assessment include duration of diseases, chief complain and detection of various organs involvement like mucocutaneous, musculoskeletal, renal, gastrointestinal , nervous and cardiopulmonary.
Routine investigation include complete blood count, random blood glucose, lipid profile, urine analysis(routine microscopy and 24 hour urine analysis), liver function tests, , ECG, X ray (chest), 2D Echo were done in all the patients to know the cardiopulmonary involvment. Autoantibody profile of each patients was determined by using AESKUBLOTS ANA17 Pro kit.All the tests were performed in thee VIMSAR medical college itself. The study was approved by the ethical committee of VIMSAR,Burla with number19-1-F-O-159/158/ dt.19.11.19 and written consent was obtained from the study groups.

Results

In our study 40 lupus patients were studied over a period of two years .All the patients in our study were females (100%). The mean age of disease onset was 30 years with (range 11- 60 years).

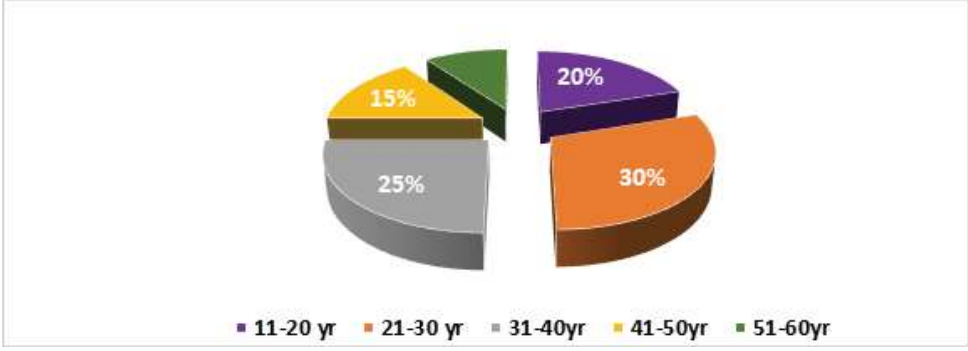

Figure 1: Age wise distribution of SLE Patients (n=40)

Age wise prevalence of SLE patients were shown in Fig 1. 75% of the subjects were less than 40 years in age. Majority of study participants belongs to age group of 21-30 years. Mean duration of disease was 18 months.

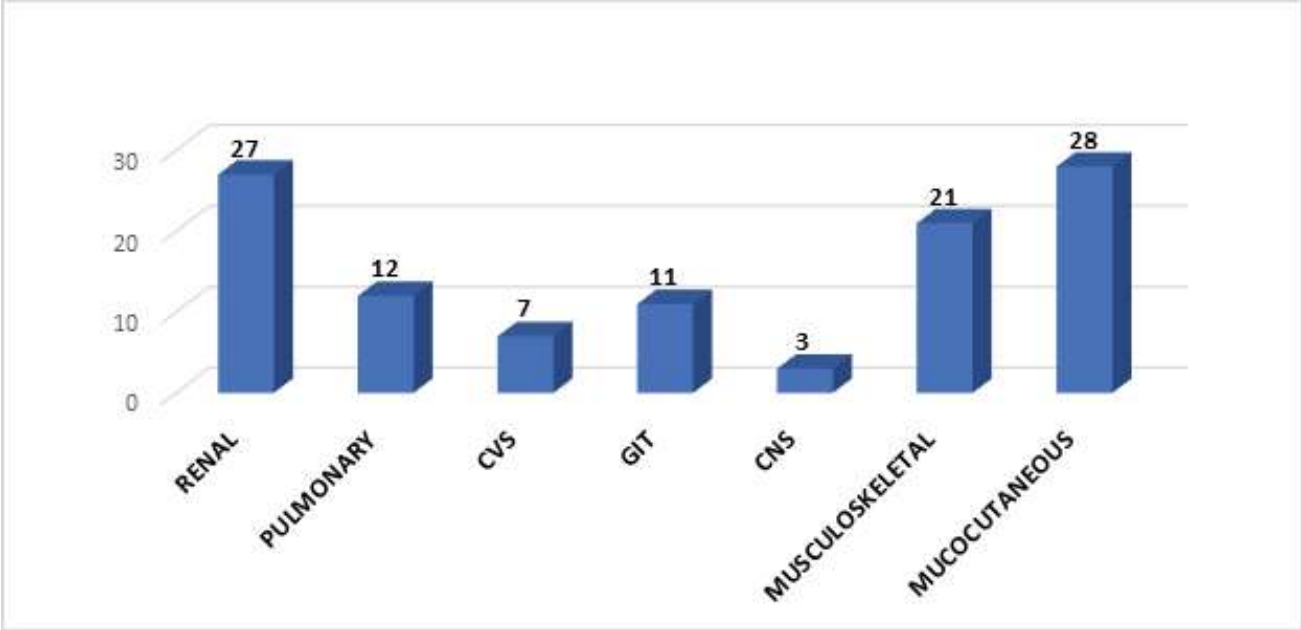

Figure 2: Distribution of various organs involvement among SLE patients(n=40)

Various organ involvement pattern among SLE patients were demonstrated in Figure 2. It was seen that the 28 patients (70%) noted to have muco-cutaneous features which is the most common manifestation or the most common organ being affected by SLE which is followed by renal , musculoskeletal, pulmonary, Gastro-intestinal & cardiovascular involvement, which was noted to be 27 patients (67.5%), 21 patients (52.5%), 12(30%) ,11 patients(27.5%) & 7(17.5%) respectively . Neuropsychiatric abnormalities were seen in only 3(7.5%) patients.

Table 1: Haematological Profile Of SLE Patients(n=40)

Profiles	Frequency (%)
HEMATOLOGICAL PROFILE:	
ANEMIA	28(70%)
LEUCOPENIA	11(27.5%)
LEUCOCYTOSIS	4(10%)
THROMBOCYTOPENIA	25(62.5%)
PANCYTOPENIA	11(27.5%)

Haematological profile of SLE patients were observed in table 1 which suggests that out of 40 patients, Anaemia was seen in 28 patients i.e (70%) which is the most common haematological manifestation . Among 28 anaemic patients; Autoimmune haemolytic anaemia was found to be the most common type of anaemia i.e 18 patients (45%) followed by 6 patients (15%) had normocytic normochromic anaemia, & 4 (10%) had microcytic hypochromic anaemia respectively. (27.5%) had leucopenia and leucocytosis in 4(10%). Thrombocytopenia in 25 patients (62.5%). Pancytopenia was featured in 11 (27.5%) patients.

Table 2(a) : Clinical and Immunological Profiles Of SLE Patients (n=40)

1.Mucocutaneous features	**Frequency (%)**	**2.Musculoskeletal features**	**Frequency (%)**
Malar Rash	28 (70)	Myalgia	18 (45)
Raynauds Phenomenon	21 (52.5)	Polyarthritis	10 (25)
Vasculitic Rash	10 (25)	Monoarthritis	7 (17.5)
Photosensitivity	9 (22.5)	Oligoarthritis	4 (10)
Oral ulcer	5 (12.5)		
3.Renal Involvement	**Frequency (%)**	4.**Pleuropulmonary Involvement**	**Frequency (%)**
Proteinuria	24 (60)	Pleural Effusion	12 (30)
Elevated serum Creatinine	19 (47.5)	Pneumonia	11 (27.5)
5.Cardiovascular Involvement	**Frequency (%)**	**6.Gastrointestinal Involvement**	**Frequency (%)**
Valvular Involvement	7 (17.5)	Ascites	11 (27.5)
Pericardial Effusion	3 (7.5)	Hepato splenomegaly	5 (12.5)

Table 2(b) : Clinical and Immunological Profiles Of SLE Patients (n=40)

1.Neurologic Involvement	**Frequency (%)**	**2.Menstrual Irregularity**	**Frequency (%)**
Cerebro-Vascular Accident	3 (7.5)	Menorrhagia	11 (27.5)
Seizure	1 (2.5)	Recurrent Abortion	7 (17.5)
		Oligo-menorrhea	6 (15)
3.Immunological Profile	**Frequency (%)**	**4.Association with other disorder**	**Frequency (%)**
Anti ds DNA	19 (47.5)	Hypothyroidism	17 (42.5)
Anti RO	17 (42.5)	Hyperthyroidism	5 (12.5)
AntiRNP	15 (37.5)	Lymphadenopathy	5 (12.5)
Antinucleosome	13 (32.5)	Pulmonary Tuberculosis	4 (10)
Anti Ribosome	12 (30)		
Anti Sm	12 (30)		
Anti histone	10 (25)		

Clinical and Immunological Profiles Of SLE Patients is presented in Table 2(a) and 2(b) It had observed that in **Musculoskeletal features:** Arthritis was the second common manifestation and was seen in 21 patients

(52.5%). Symmetrical, non-erosive, polyarthritis was noticed in 10 patients. Oligo-arthritis was found in 4 patients and mono-arthritis in 7 patients. Generalised myalgia was noted in 18 patients.

Pleuro-pulmonary features: Pulmonary involvement was noticed in 12(30%) patients. Pleuritic rub was present in 2 patients. Pleural effusion was found in 12 patients who responded to steroid therapy. Pneumonia was seen in 11 (27.5%)patients.

Cardiovascular features: Cardiac involvement was seen in 7 SLE patients (17.5%). 3 had pericardial effusion without any sign of tamponade. 4 patients had both mitral and aortic regurgitation, whereas 3 patient had only mitral regurgitation on 2D-Echo. No significant ECG changes were found in cardiac patients.

Renal Involvement: Renal involvement was noted in 27 patients (67.5%). Proteinuria (> 0.2 gm/24 hours) was found in all 24 patients (60%). Serum creatinine (> 1.5 mg/dl) was elevated in 19(47.5%). ALL the patient with nephritis were positive for dsDNA.

Neurological features: Neuropsychiatric abnormalities were seen in 3(7.5%) patients. Stroke is clinically found in 3(75%) .SLE patients may involve small, medium or large vessels. Seizure was found in 1 patients. No other neuropsychatric feature was not found in patients.

GIT involvement: Hepatosplenomegaly was present in 5 patients. 11 patients had ascites, 9 were transudative due to proteinuria , whereas 2 were exudative. Patients with exudative ascites were followed-up monthly by USG, and they responded well to steroids . Ascites occurs in SLE patients were usually secondary to cardiac, hepatic or renal disorders.

Menstrual abnormality : Among 40 females, 7 had history of recurrent abortions of which 2 were positive of antiphospholipid antibodies in diagnostic history. Menstrual irregularity was seen in 27 patients (67.5%) in the present study. Oligomenorrhoea was the most common irregularity, seen in 16 patients (40%). 11 patients experienced menorrhagia (27.5%), among these three were having hypothyroidism.

Associated disorders: Family history of SLE or other connective tissue disorders was present in 3 SLE patients. Out of 40 SLE patients, 17patients (42.5%) were having hypothyroidism and 5 patients (12.5%) was having hyperthyroidism. Pulmonary tuberculosis was developed during the disease course, in 4 patients (10%) in the present study, lymphadenopathy was noticed in 5 patients.

Immunological profile : In this study, antibodies against nuclear antigens (IgG) were analyzed using immunoblot strips coated with different antigens .It showed that autoantibodies were found against dsDNA (47.5%), Ro (42.5%) ,nRNP (37.5%),nucleosomes (32.5%), followed by, ribosomal P-protein (30%), Sm (30%), and histones (25%).

Table 3: Compares the cumulative incidence of clinical manifestations of SLE in our study as compared to other Indian studies.

Manifestations	Kosaraju et al(South India);2010	Saigalel et al(Western India);2011	Agrawal et al(Central India)2013	Talukdar et al(North East India);2020	Present(East India);2021
Fever	58.33	6.7	82.8	NA	NA
arthritis	64.58	86.7	52.9	50.34	52.5
Malar rash	35.41	43.3	71.3	46.21	70
photosensitivity	27.08	75	63.2	55.17	22.50
Oral ulcer	25	61.7	42.53	25.52	12.5
Renal involvement	20.83	56.7	69	58.03	67.50

Neurological	8.33	13.3	46	20	7.5
pulmonary	12.5	11.7	12.6	8.28	37.5
cardiovascular	NA	6.7	2.3	10.34	20
Hemolytic anaemia	0.0002	25	8.1	61.24	57.5
leukopenia	NA	33.3	14.9	7.81	27
Thrombocytopenia	NA	43.3	18.4	8.55	52.5
ANA	62	98.3	73	100	95
Anti dsDNA	43	65	42	62.6	47.5

Discussion

The study was conducted to document the clinical, hematological and immunological profile of SLE patients in the tertiary care center VIMSAR of Eastern India.

In our study it was noticed that the disease was more common in female. These findings were similar with another study carried out in Northern Kerala by Binoy et al in which, out of the 75 patients evaluated,70 were females .[16]

The Mean age of incidence was 30 years (age range11-60 years). In a study conducted by Kosaraju et al found that out of the 48 patients being studied, mean age of onset was 34.25 years (range 12-70 years) which is similar to this study in which mean age is 30 years .[17]. These findings were consistent with the study by Kishor N et al which shows mean age of onset 29.8 years (range 9-69 years) .[18]

In the present study mucocutaneous manifestation was the commonest clinical presentation (70%) which is comparable to the Agrawal et al series.[19] However the studies conducted by Binoy et al ,Saigal et al shows less mucocutaneous manifestation .[11,17]

Incidence of arthritis in our study (52.5%) is same as compared to the study by Binoy et al. Study from South India by Kosaraju et al showed 64.58% and the Western India by Saigalel et al shows 86.7% cases of arthritis. [16,11]Renal involvement is a serious complication of SLE, which is often observed to be a cause of mortality in SLE patients.[20] Incidence of Renal involvement is very high as compared to the series from other side of India. This is similar with the study carried by Talkudar et al where renal involvment is very common.[21] All the nephritis patients were positive for dsDNA confirming anti ds DNA are strongly associated with renal involvement.

Incidence of cardiac and pleuro-pulmonary features was also higher compared to other Indian series. During recent years, it has become clear that the risk of cardiovascular disease (CVD) is very high in a prototypic autoimmune disease, systemic lupus erythematosus (SLE). SLE-related CVD and atherosclerosis are important clinical problems. A combination of risk factors, like dyslipidaemia, inflammation, antiphospholipid antibodies (aPL) and lipid oxidation are related to CVD in SLE.

Incidence of haemolytic anaemia (57.5%) was found in our study which is same as the North East Indian study being conducted by Talukdar et al[21] Incidence of leucopenia(27%), and thrombocytopenia (52.5%) was high in our study which is similar to the study by Saigel et al[19] Genetic susceptibility for autoimmune haematological involvement may explain this higher incidence.

In this study Antibody against nuclear antigen (IgG) was analysed. Antinuclear antibody (ANA)are common in all patients which are in line with other published research work. It showed that autoantibodies were found against dsDNA (47.5%), Ro (42.5%) ,nRNP (37.5%),nucleosomes (32.5%), followed by, ribosomal P-protein (30%), Sm (30%), and histones (25%). However, because of low specificity it cannot be used for confirmation of disease. The most common is dsANA which is same as Talkudar et al, contradictory to study by Saigal etal. .[21,19]

Conclusion

The observation of present study suggest that SLE patients are mostly females of childbearing age group. They presented with a wide variety of manifestation involving various organs mostly muco-cutaneous, renal, musculoskeletal involvement including fever, skin rash, arthritis and anaemia to severe systemic involvements. The patients were positive for antibodies like ANA, Anti Sm, Anti Ro, Anti Ro,Anti dsDNA etc .Although immunological findings are highly variable AntidsDNA was the most frequent Ab in the Eastern India.

Recommendations- High level of suspicion is needed to diagnose the disease at its initial stages and proper autoantibody profiling should be done to support the diagnosis and to determine the prognosis and prevent it from further progression.

Limitations- Sample size is less in number and mostly female were the participants. So further extensive studies must be conducted including both the gender.

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Conflict of interest- Nil

Ethics Committee Approval-Present

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