

Original Research Article

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Study of paediatric systemic lupus erythematosus in tertiary care center in South India

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ABSTRACT

Background: Systemic lupus erythematosus (SLE) is a chronic autoimmune disease characterized by multisystem inflammation and the presence of circulating autoantibodies directed against self-antigens. The reported prevalence of SLE in children and adolescents (1-6/100,000) is lower than that in adults (20-70/100,000). The study among pediatric population were few and hence this study from south India was undertaken. Objective of this study was to study the clinical and immunological profile of children with systemic lupus erythematosus (SLE). To study the Distribution of Renal Lesions according to ISN/RPS Classification of Lupus Nephritis

Methods: Retrospective hospital based observational study in tertiary level centre in Bengaluru (BMCRI). Medical records of children with SLE admitted in Pediatric department from the period of 2010-2019 through the hospital information system were analyzed. Clinico pathological features and immunological profile were compared with other studies.

Results: Among 25 patients studied male to female ratio was 1:2.5. The mean patient's age at the time of presentation was 13.2 year, the youngest child being 7 year. The mean duration of disease before diagnosis was 1 year, most common systems involved were haematological (92%), followed by kidney (88%), GIT (72%), mucocutaneous (68%) cases. 19 (91%) cases were ANA positive and two ANA negatives. Anti-ds DNA was positive in 18(85%) patients, 5 were anti smith antibody positive. Diffuse proliferative glomerulonephritis (ISN/RPS class IV) was the most commonly seen histological pattern, seen in 9(56%) patients, 4(25%) patient had focal and segmental proliferative glomerulonephritis (ISN/RPS class III) and 2(12%) had membranous glomerulonephritis (grade ISN/RPS class V).

Conclusions: SLE can present with diverse, unpredictable clinical manifestations, the primary diagnosis can often be missed if the index of suspicion is not high, since childhood SLE does not present with classical manifestations.

Keywords: Auto antibodies, Lupus nephritis, Systemic lupus erythematosus

INTRODUCTION

Systemic lupus erythematosus (SLE) is a chronic autoimmune disease characterized by multisystem inflammation and the presence of circulating auto antibodies directed against self-antigens with flare-ups and remissions.^{1,2} The reported prevalence of SLE in children and adolescents (1-6/100,000) is lower than that in adults (20-70/100,000). SLE predominantly affects females, with reported 2-5:1 ratio before puberty, 9:1

ratio during reproductive years.^{3,4} Childhood SLE is rare before 5 year of age and median age at diagnosis of 11-12 year. Up to 20% of all individuals with SLE are diagnosed before age 16 year.

Due to the role of estrogen in etiopathogenesis of disease, SLE is more common in female as compare with male. Genetic factor superimposed on certain environmental factors plays a very pivotal role in manifesting abnormal immunological response.⁴ The first case of SLE in India

was reported in 1955.⁵ Among pediatric studies lupus nephritis is common manifestation of SLE at presentation than adults and severity varies from different studies. The study among paediatric population were few, here by authors report here the profile of cases in this centre.

This study was undertaken to study the clinical and immunological profile of children with systemic lupus erythematosus (SLE) and to study the Distribution of Renal Lesions according to ISN/RPS Classification of Lupus Nephritis.

METHODS

This was a retrospective hospital based observational single centre study in tertiary care centre.

Inclusion criteria

Those children who were diagnosed and treated as systemic lupus erythematosus were included in the study.

Methodology of this study are authors screened retrospectively all patients admitted in pediatric department from the period of 2010-2019 with discharge diagnosis of SLE and fulfilling the revised American College of Rheumatology (ACR) criteria (1997) for SLE were included in the study.⁶ Authors collected information with respect to demographic characteristics, duration of disease and assessment of various organs involvement like cutaneous, musculoskeletal, renal, gastrointestinal tract, nervous and cardiopulmonary.

Authors collected data regarding investigation including complete blood count, urine examination, serum creatinine, blood urea, chest radiograph and echocardiogram, renal biopsy, auto antibody profile in included patients mainly antinuclear antibodies (ANAs) and anti-double-stranded deoxyribonucleic acid (Ds DNA) antibodies.

Medical records of all SLE were collected in structured proforma. Clinico pathological features and immunological profile were compared with other studies.

Analysis

Authors did a descriptive analysis of clinical features present in SLE patients and calculated the mean and cumulative percentage frequency of all clinical features, systems involved and histo pathological type of nephritis in SLE patients. The data were analysed in Microsoft excel.

RESULTS

Among 25 patients, 18 patients were female and 7 were male. Male to female ratio was 1:2.5. The mean patient's age at the time of presentation was 13.2 years. The youngest child was 7 years, mean duration of symptoms

was 1 year and common presenting symptom was fever with mean duration was 5 weeks. Haematological manifestations seen in 23 (92%) cases. Anaemia was seen in 23 (92%) autoimmune haemolytic anaemia was found in 7 (23%), mild anaemia was found in 2 (8%), moderate anaemia in 16 (69%), severe anaemia was found in 5 (21%).⁷ Leucopenia was found in 6 (24%), thrombocytopenia in 7 (28%) cases.

Renal involvement was noted in 22 (88%) patients. Proteinuria of nephrotic range was seen in 21 (84%) patients and elevated serum creatinine was seen in 8(32%). Renal biopsy was performed in 16 patients having indication for biopsy. 3 children succumbed before doing biopsy. Graph 2 shows frequency of renal involvement, Diffuse proliferative glomerulonephritis (class IV) was the most commonly seen histological pattern, seen in 9(56%) patients. 4 (25%) patients had focal and segmental proliferative glomerulonephritis (class 3) and 2 (12%) had membranous glomerulonephritis (class 5). The different classes of lupus nephritis according to ISN/RPS classification is graphically depicted (Figure 1).

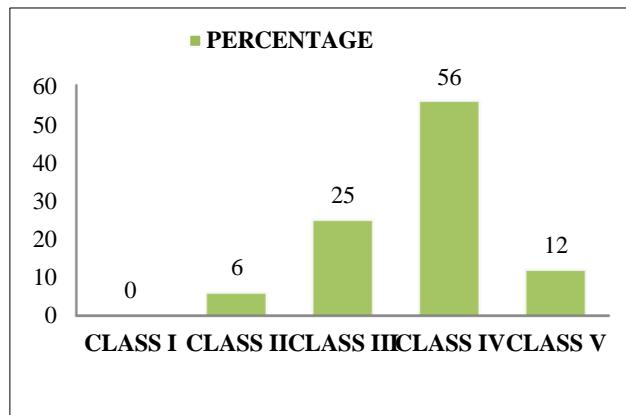


Figure 1: Frequency of histopathology lesions of kidney according to ISN/RPS classification.



Figure 2: Cutaneous manifestation of SLE.

These patients were treated with Glucocorticoids, Cyclophosphamide, Azathioprine, Mycophenolate mofetil depending on response. Hepatomegaly and splenomegaly were seen in 14 (56%) and 4 (16%) patients respectively. Twelve (48%) patients had ascites which was secondary to nephritis associated with flare.

Dermatologic manifestations noted in 17 (68%) patients. Photosensitivity seen in 15 (60%), rashes over the body in 12 (48%) malar rash in 11 (44%), alopecia in 3 (12%), oral ulcers in 13 (52%) and one patient had cellulitis and gangrene of toes. The skin manifestations are shown in Figure 2 (Discoid lupus) and Figure 3 (Nonscarring alopecia (A) and ulcer over hard palate (B).



Figure 3: (A): Non scarring alopecia, (B): Ulcer over hard palate.

Musculoskeletal features were seen in 13 (52%) cases, Arthritis was the commonest initial manifestation was

seen in 10 patients (40%). Symmetrical, nonerosive, non-deforming polyarthritis and Generalised myalgia was seen in 10 (40%) patients.

Cardiac involvement was seen in 8 patients (32%), 4 (16%) had pericardial effusion without any sign of tamponade. Two patients had mitral regurgitation with valvular involvement. 3 patients had vasculitis, no patient had significant ECG changes.

Neuropsychiatric abnormalities were seen in 6 (24%) patients. Headache was the most common symptom was seen in 5 (20%) patients, followed by seizures were seen in 3 patients (12%), 2 (8%) patients had peripheral neuropathy, 2 (8%) suffered from ischemic stroke, 1 (4%) had psychosis and Chorea was not seen in any patients. Pleuro-pulmonary involvement was noticed in 5 (20%) patients.

Pleural effusion was present in 2 (8%) patients and interstitial pneumonitis was seen in 2 (8%) patients. Moderate pulmonary hypertension was seen in one case. 2 patients (8%) had hypothyroidism and type 1 diabetes mellitus.

Menstrual irregularity was observed in one patient presented with menorrhagia and oligomenorrhoea. Two patients were having family history of SLE or other connective tissue disorders.

The frequency of occurrence of various organ involvement described above is graphically depicted (Figure 4) and the same is depicted in detail according to number and percentage of involvement in tabular form (Table 1).

Table 1: Various clinical manifestation in SLE.

Sl. No	Component	No (Percentage)	Sl. No	Component	No (Percentage)
1	Fever	16 (64%)	6	Mucocutaneous	17 (68%)
2	Lymphadenopathy	5 (20%)		Photosensitivity	15 (60%)
				Malar rash	11 (44%)
3	Haematological	23 (92%)		Oral ulcer	13 (52%)
	Anaemia	23 (92%)		Alopecia	3 (12%)
	Leucopenia	6 (24%)	7	Cardiovascular	8 (32%)
	Thrombocytopenia	7 (27%)		Pericardial effusion	4 (16%)
4	Musculoskeletal	13 (52%)		Valvular involvement	2 (8%)
	Polyarthralgia	10 (40%)	8	Pleuropulmonary	5 (20%)
	Myalgia	10 (40%)		Pleural effusion	2 (8%)
5	Neurological	6 (24%)		Interstitial pneumonitis	2 (8%)
	Seizure	3 (12%)	10	Gastro-Intestinal	18 (72%)
	Neuropathy	2 (8%)		Hepatomegaly	14 (56%)
	CVA	2 (8%)		Ascitis	12 (48%)
	Psychosis	1 (4%)		Splenomegaly	4 (16%)
6.	Renal	22 (88%)	11	Endocrine	4 (16%)
	Proteinuria	21 (84%)		Hypothyroidism	2 (8%)
	Elevated serum creatinine	8 (32%)		Diabetes mellitus	2 (8%)

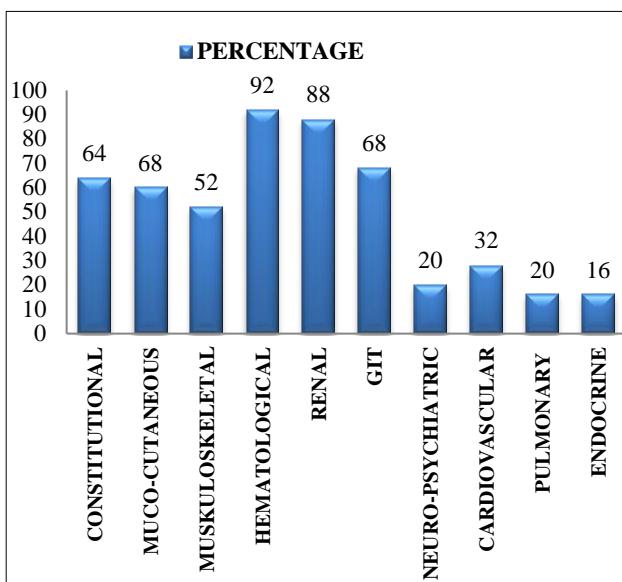


Figure 4: Frequency of various system involvement in SLE.

Immunological profile

Anti-nuclear antibodies (ANA) done in 21 cases among which 19 (91%) cases had positive and two ANA negatives.

Anti-ds DNA was positive in 18 (85%) patients, anti-smith antibody, anti-rib nucleosome antibody was positive in 5 cases each, anti Ro/La antibody and anti-histone antibodies were positive in 2 and 1 case respectively.

DISCUSSION

With increasing awareness and easy availability of immunological investigations, childhood SLE is now more often and more readily diagnosed even in the first decade of life. We encountered 25 cases diagnosed within a year of their initial manifestations. The mean duration of illness prior to diagnosis was one year in our study similar to observation of Singh S et al.⁸ The mean age at the time of onset of symptoms is 12.1 years which was similar to other studies, there were 4 cases below 10 years all were presented with nephrotic syndrome.⁸⁻¹⁰ The female to male ratio in this series was much lower than other studies but concordance with study by Siti Khadhija et al.¹¹⁻¹³

The most common clinical manifestation was haematological with anaemia in 92% cases, haemolytic anaemia was found in 33% of cases similar to other studies.⁸⁻¹⁰ The second most common features was renal manifestation seen in 88% of the cases similar to observations made by Perfumo F et al, Indira Agarwal et.al, 77.1%. Ali et al, and Singh et.al, reported it in 75% and 56%, respectively.^{8,14-16} The most common histopathological lesion observed was consistent with

Class IV lupus nephritis (56%) followed by Class III lupus nephritis (25%) similar to the observations in Ilias M et al, and other studies.^{9,15,17}

Cardiovascular (CVS) manifestations involving pericardium, myocardium and endocardium are known to occur in up to 30% of children.^{1,2} 32% cases had CVS involvement in our study. Similar observation was noted in Dubois et al, however other studies from India,¹⁸⁻²⁰ reported less cardiovascular manifestation. The incidence of neuropsychiatric manifestations (24%) was similar to other studies and lower than the Singh S et al, study.^{8,18,21}

ANA positivity was seen in 91% of our patients 9% of cases were ANA negative similar to Mondal R et al, whereas Pradhan S V et al, described no ANA negative pediatric SLE cases.^{22,23} Anti dsDNA antibody titers were positive in 85% of the cases. Hypocomplementemia, noted in 92% of our cases was similar to other two series from India.^{16,24}

CONCLUSION

To conclude, SLE can present with diverse, unpredictable clinical manifestations with variable disease activity at different age. The primary diagnosis can often be missed if the index of suspicion is not high, since childhood SLE does not present with classical manifestation.

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Conflict of interest: None declared

Ethical approval: Not required

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