

## A STUDY OF PULMONARY MANIFESTATIONS IN THE PATIENTS OF SYSTEMIC LUPUS ERYTHEMATOSUS IN A TERTIERY CARE HOSPITAL

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### ABSTRACT

#### BACKGROUND

Systemic lupus erythematosus is an autoimmune disorder characterised by multisystem involvement. Pulmonary involvement is common in SLE. Pulmonary manifestations include pleuritis, pleural effusion, interstitial lung disease and shrinking lung syndrome. There are few such studies in India. Hereby, we studied pulmonary manifestations of SLE in a tertiary centre in South India.

#### MATERIALS AND METHODS

50 patients diagnosed to have SLE with disease duration more than 5 years were included in the study. Detailed clinical history and examination was conducted. They were subjected to chest x-ray, high-resolution CT scan, pulmonary function test and sputum examination was done. These patients were screened for various respiratory symptoms. The radiological features and pulmonary function test features were analysed for both symptomatic and asymptomatic patients. Pulmonary manifestations in patients of lupus nephritis was also studied.

#### RESULTS

Out of 50 patients, 8% were males and 92% were females. 44% patients were symptomatic and 56% were asymptomatic. In our study, pleuritis with effusion were present in 12 patients (24%), consolidation with effusion were present in 2 patients (4%), asymptomatic pleural effusion were present in 2 patients (4%), symptomatic interstitial lung disease was seen in 3 patients (6%), asymptomatic interstitial lung disease was seen in 10 patients (20%), pneumonitis were present in 3 patients (6%) and asymptomatic mediastinal lymphadenopathy in 2 patients (4%). 50% of the patients having lupus nephritis had pulmonary manifestations.

#### CONCLUSION

Pleural effusion and interstitial lung disease were common manifestations. Pleural effusion was slightly more common. Even in asymptomatic patient with normal chest x-ray and pulmonary function, HRCT chest detected pulmonary involvement in significant number of cases. Thus, it is important to do HRCT chest even with subtle clinical respiratory symptoms to detect early respiratory involvement in the patients of SLE.

#### KEYWORDS

SLE, Pulmonary Manifestations, HRCT Chest, Lupus Nephritis.

**HOW TO CITE THIS ARTICLE:** Narayanaswamy YN, Kulkarni A, Kumar TA. A study of pulmonary manifestations in the patients of systemic lupus erythematosus in a tertiary care hospital. J. Evid. Based Med. Healthc. 2017; 4(94), 5866-5869. DOI: 10.18410/jebmh/2017/1181

#### BACKGROUND

Systemic Lupus Erythematosus (SLE) is a clinical syndrome with a complex, multifactorial aetiology characterised by inflammation and involvement of multiple organ systems.<sup>1</sup> SLE is a chronic autoimmune disease characterised by microvascular inflammation with the generation of autoantibodies that can affect almost any organ system. Its presentation and course are highly variable SLE and

*Financial or Other, Competing Interest: None.*

*Submission 25-11-2017, Peer Review 29-11-2017,*

*Acceptance 06-12-2017, Published 16-12-2017.*

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*DOI: 10.18410/jebmh/2017/1181*

pulmonary manifestations. The majority of patients with SLE develop pleural or pulmonary disease. Lung manifestations were frequent in SLE patients from Saudi Arabia with pleural effusion, consolidation and atelectasis being the most common. Low complement levels, high anti-dsDNA levels and disease activity were significantly associated with abnormal HRCT findings.<sup>2</sup> The pleuropulmonary manifestation of Systemic Lupus Erythematosus (SLE) are pleuritis, acute lupus pneumonitis, chronic interstitial lung disease with fibrosis, alveolar haemorrhage, respiratory muscle and diaphragmatic dysfunction, atelectasis, bronchiolitis obliterans, pulmonary vascular disease with pulmonary hypertension and pulmonary embolism.<sup>3</sup> The pleura are the most common thoracic localisation of SLE. Record studies with the use of imaging techniques like HRCT chest suggest that not only pleural diseases are common,



but airway disease, lymphadenopathy and interstitial lung diseases are also common than previously thought. HRCT will also be useful in permitting invasive procedures like lung biopsy and bronchodilator lavage to specific site of interest.

**Aim of the Study-** To study various pulmonary manifestations in patients of systemic lupus erythematosus.

### **MATERIALS AND METHODS**

The study was conducted from May 2012 to May 2013 in Rajiv Gandhi Government Hospital in Chennai. The patients attending the outpatient department and getting admitted to Department of Medicine and Rheumatology were included in the study.

#### **Inclusion Criteria-**

Patient known case of SLE fulfilling ACR criteria with disease duration more than 5 years were taken into the study.

#### **Exclusion Criteria-**

- Childhood lupus.
- Pregnancy.
- Overlap syndrome.
- Mixed connective tissue disorder.
- ILD due to occupational lung disease and other non-lupus causes.

Detailed history was taken from patient and subjected to thorough clinical examination and investigations. History regarding presence of lupus nephritis was also taken. 50 patients were included in the study after studying inclusion and exclusion criteria. Both symptomatic and asymptomatic were taken into study patients were subjected to the following investigation, chest x-ray, HRCT chest, pulmonary function tests, complete haemogram, renal and liver function tests, sputum analysis, urine analysis, immunological investigations on need for basis are done such as CRP, ANA, RF anti-dsDNA ACL (IgM) and IgG and various finding like with pleuritis with or without pleural effusion, alveolitis, interstitial fibrosis, lupus pneumonitis, shrinking lung syndrome, intra-alveolar haemorrhage, pulmonary thromboembolism and pulmonary arterial hypertension, secondary effects are atelectasis due to diaphragmatic weakness, pneumonia, drug side effects and pleura-pulmonary consequences of cardiac failure and renal failure. Institutional ethical committee clearance was obtained. Informed consent was obtained from all patient.

#### **Statistical Analysis-**

Statistical analysis done using SPSS software.

### **RESULTS**

A total of 50 patients who were known case of SLE according to ACR criteria were included in the study. The duration of the disease was more than 5 years. We observed that 70 percent of patients of SLE were in 3<sup>rd</sup> and 4<sup>th</sup> decade. 92 percent were females and 8 percent were males. The duration distribution of the present study were as follows,

38 percent of patients were between 5 to 10 years of duration, 30 percent of patients were between 11 to 15 years of duration, 10 percent of patient were between 16 to 20 years of duration, 18 percent of patients were between 21 to 25 years of duration and 4 percent of patients were between 26 to 30 years of duration. In our study, among 50 patients, symptomatic were 22 patients (44%) and asymptomatic were 28 patients (56%). In the present study, cough was present in 8% of patients, cough with expectoration was present in 4% of patient, dyspnoea was present in 16% of patients, pleurisy was present in 26% of patients and 32% of patients were asymptomatic. In our study, various pulmonary manifestation were distributed as follows, pleuritis with effusion were present in 12 patients (24%), consolidation with effusion were present in 2 patients (4%), asymptomatic pleural effusion were present in 2 patients (4%), symptomatic interstitial lung disease was seen in 3 patients (6%), asymptomatic interstitial lung disease was seen in 10 patients (20%), pneumonitis were present in 3 patients (6%) and asymptomatic mediastinal lymphadenopathy in 2 patients (4%). In our study, total patients presenting with dyspnoea were 8 patients due to interstitial lung disease 6 patients and in 2 patients due to other causes like anaemia, nephritis and others. Lupus nephritis was present in 6 patients (12%) and absent in 44 patients (88%). Out of these 6 patients, pulmonary manifestations like consolidation with effusion was seen in 1 patient (16.6%), pleural effusion in 2 patients (33.3%) and 3 patients (50%) had no pulmonary manifestation. In our study, x-ray findings were present in 26 percent of patients (130). Abnormal x-ray findings were seen in 13 patients like pleural effusion in 8 patients (61.54%), reticular opacity in 3 patients (23.07%) and consolidation with effusion in 2 patients (15.38%). In this study, HRCT showed positive results in 20 patients who were symptomatic (40%), and among asymptomatic, 14 patients had positive HRCT findings (28%) and rest of 16 patients who were asymptomatic showed normal HRCT. HRCT findings were pleuritis with pleural effusion was seen in 14 patients (41.17%), interstitial lung disease in 13 patients (38.23%), pneumonitis was seen in 3 patients (8.82%), consolidation with effusion in 2 patients (5.88) and mediastinal lymphadenopathy in 2 patients (5.88). Pulmonary function test was positive in 7 patients (14%), all of which were restrictive patterns and no case of obstructive pattern seen in pulmonary function test. HRCT alone were positive in 21 patients (42%), x-ray chest and HRCT both positive in 13 patients (26%) and both HRCT and x ray chest negative in 16 patients (32%). In this study, HRCT alone positive in 27 patients (54%), both HRCT and PFT positive in 7 patients (14%) and both HRCT and PFT negative in 16 patients (32%). Male patients with pulmonary manifestations are pleural effusions in 2 patients, pneumonitis in 1 patient and consolidation with effusion in 1 patient. Among females, pleural effusions was present in 12 patients, consolidation with effusion in 1 patient, pneumonitis in 2 patients, interstitial lung disease in 13 patients and mediastinal lymphadenopathy in 2 patients. In the present study, ILD in

respect to duration are as follows in 11 to 15 years of duration of disease, 2 patients had ILD between 16 to 20 years, 1 patient had ILD and duration of 21 years and above ILD present in 10 patients.

## DISCUSSION

The present study was conducted in 50 cases of SLE to study the various pattern of pulmonary involvement. In the present study, 22 patients (44%) were symptomatic and 28 patients were asymptomatic (56%). In study by S Kakati et al, out of 40 patients, 9 were symptomatic (23.68%) and 31 patients were asymptomatic (77.5%).<sup>1</sup> In study by H M Fenlon et al, 26 patients (77%) were asymptomatic and 8 patients (23%) were symptomatic.<sup>2</sup> In the present study, pleurisy was seen in 12 patients, dyspnoea in 8 patients, cough in 4 patients and cough with expectoration in 2 patients. In study by S Kakati et al, out of 40 patients, 6 had cough, 4 had dyspnoea and 3 had pleurisy.<sup>1</sup> In study by Donato Alarcon Segovia, cough was present in 21 patients, dyspnoea in 18 patients, cough with expectoration in 14 patients, pleurisy in 12 patients and haemoptysis in 5 patients. In our study, pleuritis with effusion were present in 14 patients (28%), consolidation with effusion in 2 patients (4%), ILD in 13 patients (26%), pneumonitis in 3 patients (6%) and lymphadenopathy in 2 patients (4%). In study by S Kakati et al, pleural effusion in 4 patients (10.53%), ILD in 15 patients (39.47%), consolidation in 2 patients (5.26%), lymphadenopathy in 2 patients (5.26%) and bronchiectasis in 3 patients (7.8%).<sup>1</sup> In study by Fenlon et al, 11 patients (33%) had ILD, pleural effusion in 7 patients (21%), lymphadenopathy in 6 patients (18%), bronchiectasis in 7 patients (21%) and consolidation in 2 patients (6%).<sup>4</sup> In our study, lupus nephritis was present in 6 patients (12%) and absent in 44 patients (88%). In S Kakati et al study, lupus nephritis was present in 23 patients (69%).<sup>1</sup> In our study, x-ray finding were present in 13 patients (26%). HRCT findings were present in 34 patients (68%). PFT was restrictive pattern in 7 patients (14%) and obstructive pattern in none. In study S Kakati et al, x-ray findings were positive in 7 patients (18.42%). PFT had abnormality in 11 patients (28.95%); 10 had restrictive pattern (26.32%) and 1 had obstructive pattern (2.63%).<sup>1</sup> HRCT findings were present in 21 patients (55.26%).<sup>1</sup> In our study, HRCT was abnormal in 34 patients (68%), out of which, 20 were symptomatic and 14 were asymptomatic. Chest x-ray was abnormal in 13 patients and all were symptomatic. PFT was abnormal in 7 patients, out of which, 3 patients were symptomatic and 4 were asymptomatic. In S Kakati et al study, 21 patients had abnormal HRCT findings (55.26%), out of which, 9 were symptomatic and 12 were asymptomatic. Chest x-ray was abnormal in 7 patients who were symptomatic. PFT was abnormal in 11 patients, out of which, 7 were symptomatic and 4 were asymptomatic.<sup>1</sup> In our study, pleural effusion was seen in 14 patients, consolidation with effusion in 2 patients, interstitial thickening in 13 patients, ground-glass opacity in 11 patients, parenchymal bands in 2 patients and lymphadenopathy in 2 patients. In S Kakati et al study,

pleural effusion was seen in 4 patients, thickened pleura in 1 patient, subpleural band in 2 patients, lymphadenopathy in 2 patients, interstitial thickening in 15 patients, ground-glass opacity in 10 patients, airspace consolidation in 2 patients and bronchiectasis in 3 patients.<sup>1</sup>

According to Haupt et al, pleuritis and pleural effusions were attributed to SLE in 22 of 36 (61 percent) and three of 28 (11 percent) patients, respectively. The findings suggest that many nonspecific pulmonary lesions previously attributed to SLE, such as alveolar haemorrhage, alveolar wall necrosis, oedema and hyaline membranes are probably secondary to intercurrent infection, congestive heart failure, renal failure or oxygen toxicity.<sup>5</sup>

A review of all SLE patients from 1984-1986 with interstitial pneumonitis revealed that 10 of the 12 patients had antibodies to Ro (SS-A). The frequency of anti-Ro (SS-A) with interstitial pneumonitis in SLE patient suggests a possible association between the two.<sup>6</sup>

The clinical course of chronic diffuse Interstitial Lung Disease (ILD) was studied in 14 patients with SLE. The mean duration of followup was 7.3 years. All patients had dyspnoea on exertion, pleuritic chest pain, chronic cough and basilar rales. Chest roentgenogram showed diffuse or basilar infiltrates, pleural disease and elevation of both diaphragms.<sup>7</sup>

## CONCLUSION

Pleural effusion with or without pleuritis and interstitial lung disease were of almost equal incidence still pleural effusion was slightly more common. Even in asymptomatic patient with normal chest x-ray and pulmonary function, HRCT chest detected pulmonary involvement in significant number of cases. Thus, it is important to do HRCT chest even with subtle clinical respiratory symptoms to detect early respiratory involvement and aggressively treat the respiratory manifestation without allowing it to develop into irreversible changes. Pulmonary manifestations can coexist with lupus nephritis. Hence, the lung manifestations has to be monitored, while tapering the dose of immunosuppressants.

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