Original Article

Study of pulmonary manifestations in systemic lupus erythematosus cases

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Abstract

Objectives: To Study the pulmonary manifestations in systemic lupus erythematosus cases observed in tertiary care institute. **Materials and Method:** The patients attending outpatient departments or admitted to wards during the period, who fulfilled the revised ACR criteria for classification of SLE were included in the study. Detailed medical history including age, sex, age of onset, duration of illness and various clinical presentations especially pulmonary manifestations (e.g. cough, chest pain, dyspnea and cyanosis) was recorded in a preformed proforma. Thorough clinical examination with special attention to chest examination was performed in all the study patients. Plain X-ray chest and HRCT was performed in all the patients. Pulmonary function tests also performed in all the patients and the findings observed were recorded. **Results:** The proportion of female was more as compared to male. 28% patients presented with symptom of pulmonary manifestations. The most common symptom observed was cough followed by exertional dyspnoea and chest pain. On chest X ray it was observed that 32% patients showed positive X-ray findings. Pulmonary function test with decreased diffusion lung capacity was observed in 86% patients. HRCT is found to have interstitial lung pattern in 72% patients. **Conclusion:** Pulmonary manifestations on clinical presentation were positive in 28% patients whereas on X-ray chest it was positive in 32% patients. PFT and HRCT showed pulmonary manifestations in 68% and 72% patients. Thus HRCT detected pulmonary involvement in a significant number of patients who are often asymptomatic

Key Words: Systemic lupus erythematosus cases, pulmonary manifestations.

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INTRODUCTION

Systemic lupus erythematosus (SLE) is a clinical syndrome with a complex, multifactorial aetiology, characterized by inflammation and involvement of multiple organ systems. In a study conducted near Delhi, the prevalence of SLE was found to be 3.2 per 1, 00,000 populations.[1] Systemic lupus erythematosus (SLE) is an autoimmune disease that primarily affects women of childbearing age with 10:1 female to male ratio.[2] Any organ can be affected by SLE; pulmonary involvement is usually in the latter course of the disease.[3,4,5] Any part of the pulmonary system can be affected including airways, lung parenchyma, pulmonary vasculature, pleura and diaphragm.[3-8] If SLE develops after age 49 years, it has a higher incidence of serositis, pulmonary involvement and mortality.[9] It is difficult to find out the true prevalence of pulmonary complications of SLE since many cases are due to infections.[7] A recent autopsy study of 90 patients diagnosed with SLE, according to the American College of Rheumatology, pleuropulmonary involvement occurred in 98% of the autopsies.[5] The most frequent findings were pleuritis (78%), bacterial infections (58%), alveolar hemorrhage (26%), followed by distal airway alterations (21%), opportunistic infections (14%) and pulmonary thromboembolism (8%), both acute and chronic.[5] In a larger series, 25% of patients with SLE had clinical and/or radiographic evidence of pulmonary involvement.[10] Pulmonary and pleural involvement in

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patients with systemic lupus erythematosus (SLE) has been reported with incidence ranging from 7% to 100%[4]. Primary associations include pleural effusions, alveolitis, interstitial fibrosis, lupus pneumonitis, bronchiolitis obliterans organizing pneumonia, obliterative bronchiolitis, pulmonary vasculitis and hemorrhage, pulmonary arterial hypertension, and pulmonary thromboembolic disease[11-14]. Secondary effects include atelectasis due to diaphragmatic dysfunction, opportunistic pneumonia, drug toxicity, and the pleuropulmonary consequences of cardiac and renal failure[11-14]. The present study was conducted to evaluate the pulmonary involvement among the patients of systemic lupus erythematosus cases.

MATERIALS AND METHOD

This study was conducted in the department of Medicine, ABC Medical College. All Patients attending outpatient departments or admitted to wards during the period, who fulfilled the revised ACR criteria for classification of SLE were included in the study. Patients who were Pregnant or suffering from occupational lung diseases or known case of hypertension, diabetic mellitus and cardiac diseases were excluded from the study. Thus total 25 cases were selected in the preset study. Detailed medical history including age, sex, age of onset, duration of illness and various clinical presentations especially pulmonary manifestations (e.g. cough, chest pain, dyspnea and cyanosis) was recorded in a preformed proforma. Thorough clinical examination with special attention to chest examination was performed in all the study patients. Necessary laboratory investigations were performed accordingly. Plain X-ray chest and HRCT was performed in all the patients. Pulmonary function tests also performed in all the patients and the findings observed were recorded. The collected data was entered in Microsoft excel and was analysed and presented with appropriate tables and graphs.

RESULTS

Table 1: Age and sex distribution

Variable		Number of Patient	Percentage
Age	15-30	12	48%
	31-45	11	44%
	>46	2	8%
Sex	Male	3	12%
	Female	22	88%

In the present study total 25 cases of systemic lupus erythematosus and it was observed that majority of the patients were in the age group of 15-30 years of age (48%) followed by 31-45 years of age (44%). The proportion of female was more as compared to male with female to male ratio of 7.33:1.

Table 2: Distribution according to symptomatic lung involvement

Symptomatic lung involvement	Number of patient	Percentage
Positive	7	28%
Negative	18	72%

It was seen that 7 (28%) patients in the study were presenting with symptom of pulmonary manifestations. Out of them 6 were female patients and 1 was male. The most common symptom observed was cough followed by exertional dyspnoea and chest pain.

Table 3: Distribution according to chest x-ray findings

chest x-ray findings	Number of patient	Percentage
Positive	8	32%
Negative	17	68%

On chest X ray it was observed that 8 (32%) patients showed positive X-ray findings. The most common finding on chest X-ray was pleural effusion followed by reticular opacity or atelectasis. Majority of the patients with positive x-ray findings were female patients.

Table 4: Distribution according to positive pulmonary function test

PFT	Number of patient	Percentage
Positive	17	68%
Negative	8	32%

Pulmonary function test with decreased diffusion lung capacity is suggestive of restrictive lung pattern was observed in 17 (86%) patients out of the 25 patients.

Table 4: Distribution according to HRCT findings

HRCT	Number of patient	Percentage
Positive	18	72%
Negative	7	28%

HRCT is found to have interstitial lung pattern in 18 (72%) patients out of the 25 patients.

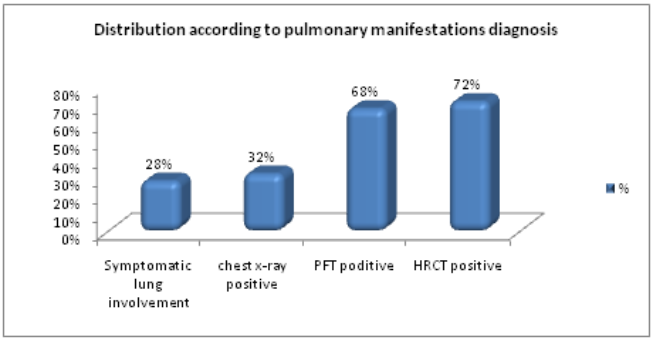

Figure 1

DISCUSSION

Systemic lupus erythematosus (SLE) is a multi-system autoimmune disease. The wide range of organ system involved in the disease includes musculoskeletal, cutaneous, haematological, neurological, cardiac, pulmonary, renal, gastrointestinal, vascular and ocular systems. Lungs are involved in almost half of the patients during the disease course. Pulmonary manifestations may be the presenting symptoms in 4–5% of patients. The early demonstration of lung involvement in SLE patients is difficult. The pulmonary manifestations in SLE vary from patient to patient but usually include cough with or without sputum, dyspnea, hemoptysis and chest pain.[15] SLE may affect all the components of the respiratory system, including upper airways, lung parenchyma, pulmonary vasculature, pleura and respiratory muscles.[16]

In the present study total 25 patients of systemic lupus erythematosus admitted to the study institute were evaluated. Out of 25 patients 22 were females and only 3 were male, i.e.88% were female which showed that the disease is commoner in females with female to male ratio of 7.33:1. Majority of the female were of chid bearing age group. Samiha Samuel[17], Al Abbad *et al*,[18] and Omer S.B *et al*[19] also observed similar findings in their study. It was seen that 7 (28%) patients in the study were presenting with symptom of pulmonary manifestations. Out of them 6 were female patients and 1 was male. The most common symptom observed was cough followed by exertional dyspnoea and chest pain. Similar findings were also reported by Samiha Samuel[17], Al Abbad *et al*,[18] and Omer S.B *et al*[19] in their study. Samiha Samuel[17] observed exertional dyspnea, productive cough and chest pain as commonest presenting symptom. Delgado *et al*[20] also observed similar symptoms in their study. Any part of the pulmonary system can be affected including airways, lung parenchyma, pulmonary vasculature, pleura and diaphragm.[3-8] If SLE develops after age 49 years, it has a higher incidence of serositis, pulmonary involvement and mortality.[9] It is difficult to find out the true prevalence of pulmonary complications of SLE since many cases are due to infections.[7] On chest X ray it was observed that 8 (32%) patients showed positive X-ray findings. The most common finding on chest X-ray was pleural effusion followed by reticular opacity or atelectasis. Majority of the patients with positive x-ray findings were female patients. Sant SM[21], Fenlon HM[22] and Samiha Samuel[17] observed chest X-ray abnormalities in 34%, 24% and 18.42% patients. Kim JS, Lee KS[23] proved that primary intrathoracic manifestations include pleural disease, acute lupus pneumonitis, subacute interstitial lung disease including bronchiolitis obliterans organizing pneumonia and non-specific interstitial pneumonia with fibrosis, chronic interstitial lung disease of usual interstitial pneumonia, pulmonary haemorrhage, pulmonary vascular disease, small airway disease of bronchiolitis obliterans, and pulmonary arterial hypertension. Secondary intrathoracic manifestations include atelectasis due to diaphragmatic dysfunction, opportunistic pneumonia, drug and oxygen toxicity, aspiration, and pleuropulmonary consequences of cardiac and renal failure. Pulmonary function test with decreased diffusion lung capacity is suggestive of restrictive lung pattern was observed in 17 (86%) patients out of the 25 patients. Samiha Samuel[17] and Karim *et al*[24] also observed similar findings in their study. HRCT is found to have interstitial lung pattern in 18 (72%) patients out of the 25 patients. The findings were comparable with various authors. Fenlon HM *et al*[25] reported 70% patients to have interstitial lung pattern diagnosed on HRCT. Ooi GC *et al* reported HRCT abnormalities in 60% patient.[26] Incidence of HRCT abnormality in study by S Kakati *et al*[27] was 55.26% which is lower than the present study. Sant SM *et al*[21]assessed the nature of pleuropulmonary abnormalities, with particular reference to interstitial lung disease (ILD), in patients with systemic lupus erythematosus (SLE). Total 29 patients were evaluated using high resolution computed tomography (HRCT), plain chest radiography (CXR) and pulmonary function tests (PFTs). The HRCT was abnormal in 72% (20/29) of patients, while 34% (10/29) had an abnormal CXR. The most frequently detected primary HRCT abnormality was suggestive of ILD and was noted in 11 patients (38%). Kakati *et al*[28] studied thirty-eight patients fulfilling the ACR criteria for SLE using chest X-ray, PFT and HRCT chest to find out the pulmonary involvement. Thirty-five out of 38 patients were females. Clinical signs and symptoms referable to pulmonary involvement were present in 9 patients. HRCT showed abnormalities in 21 patients in contrast to pulmonary function abnormalities in 11 patients and chest X-ray abnormalities in 7 patients. The abnormalities on HRCT included interstitial lung disease in 15 patients, bronchiectasis in 3, pneumonia in 2, and pleural abnormalities in 7 patients. The overall pulmonary involvement was observed in 22 patients of whom HRCT detected abnormalities in 21 patients. Pulmonary involvement is present in a significant number of SLE patients as detected by HRCT. However, in the majority, it is asymptomatic.

CONCLUSION

Thus we conclude that pulmonary manifestations on clinical presentation were positive in 28% patients whereas on X-ray chest it was positive in 32% patients. PFT and HRCT showed pulmonary manifestations in 68% and 72% patients. Thus HRCT detected pulmonary

involvement in a significant number of patients who are often asymptomatic.

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