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Pulmonary Manifistation of Systemic Lupus Erthymatosus Sle.

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Abstract

Background

Systemic lupus erythematosus is a rare complex autoimmune disease with multisystem involvement. SLE may affect all components of the respiratory system alveoli, airway, interstitum and respiratory muscle.

Aim of study

Assessment of pulmonary manifestation in systemic lupus erythematosus using clinical evaluation, radiological studies, and spirometer.

Patient and method

Study conducted at Diwaniyah teaching hospital where data taken from 1st October 2021 to 25th April 2022 Cross-sectional study. All pt send for a chest x-ray and spirometer.

Result

Lung involvement was assessed in 50 patients with systemic lupus erythematosis, not selected by respiratory symptoms, the history was taken regarding respiratory symptoms, chest X-ray, and spirometer.

24 of our patients has respiratory symptoms.
23 has abnormal CXR.
35 has a restrictive spirometer.
4 has an obstructive spirometer.

Conclusion

Assessment of pulmonary manifestation in SLE shows spirometer related to higher abnormalities rather than clinical history and radiology.

Keywords: pulmonary manifestation; Systemic lupus erythematosus (SLE); HCV; and Diwaniyah Teaching Hospital.

Introduction

Systemic lupus erythematosus (SLE) is a chronic autoimmune inflammatory disease with a wide spectrum of clinical and serological manifestations caused by: [1,2]

- Autoantibody production, complement activation, and immune complex deposition.
- The etiopathogenesis of SLE is not entirely clear, but it is believed that it results from the complex interaction between genetic and hormonal factors, and environmental exposure.

Environmental factors include:

- Ultraviolet light

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- Chemical hydrazine's
- Drug trimethoprim
- Infection: - CMV, HCV, Parvovirus

SLE has an unpredictable course that represents a challenge in the understanding of this disease. Hence, efforts have been directed toward the identification of its different pathogenic pathways, which in turn allows evaluating of the activity and progression of the disease and its responses to the different therapeutic approaches, all this through pre-established scores. The incidence of SLE varies among ethnic groups and by geographic location, sex, and age. The reported prevalence of SLE in the general population is approximately 20 to 150 cases per 100,000 persons. [3,4]

A report submitted by the National Arthritis Data Working Group estimated that SLA affects 250,000 Americans. The prevalence of SLE in the U.S. demonstrates a distinct elevation among Asian, Afro-American, Afro-Caribbean, and Hispanic Americans compared with Americans of Eastern European descent. For example, the prevalence of SLE among Caucasian patients in Rochester, Minn [5]., is approximately 40 cases per 100,000 persons, compared with Hispanic patients in Nogales, Arizona, where the rate is 100 cases per 100,000 persons. Black persons in Africa have a much lower incidence of SLE than African Americans in the U.S. The incidence of SLE in various populations. Also, a topic in need of further investigation. Epidemiologic data utilizing lupus registries point to the need for larger, population-based studies with a large patient base. Such data are currently lacking because of potential obstacles such as differing case definitions, small-source populations, and varying demographic group targets. [6]

SLE is more common in women, particularly those of child-bearing age. This increased incidence may be attributed to hormones, namely estrogen, as studies have shown women who had early menarche or who used oral contraceptives or hormonal therapies had an increased risk of SLE. The lower risk in men is like that in prepubertal or postmenopausal women. Klinefelter's syndrome [7], which features an extra X chromosome in males, is linked to an elevated incidence of SLE, thereby providing further support for the association between SLE and possible hormonal pathogenesis. [8]

Most common manifestation of pulmonary disease. Often asymptomatic but may have pleuritic pain due to pleuritis with a pleural rub, pleuritis is found in 30% – 50% of patients. Pleural effusions are found in 50% of patients, which may cause breathlessness. [9]

These are often bilateral and exudative, which is neutrophilia, or lymphocytosis if the effusion is chronic. Can be haemorrhagic. Rarely develops into fibrothorax. Pleural biopsy findings are non–specific. Need to exclude other causes for effusion such as empyema or malignancy [10]. If symptomatic may need treatment with NSAIDs or steroids. Occurs in up to 70% of patients, but is usually mild and asymptomatic. Radiologically like rheumatoid lung fibrosis. Only 5% develop a clinical disease like UIP, with dyspnea [11], cough, and basal crackles. May be associated with pleuritic pain. PFTs show restrictive defects with reduced Kco [12]. Rarely, progressive, and severe. In < 2%, severe illness with mortality rate > 50%. Cough, dyspnea [13], fever, pleuritic pain, and hypoxia. Widespread crackles. CXR shows infiltrates, which may be widespread. Histologically, non–is a specific acute alveolar wall injury [14]. Need to exclude infection and pulmonary oedema. Treatment: steroids and cytotoxic drugs may be necessary, and may have a good response. Can progress to chronic interstitial pneumonitis [15,16]. This study aims to Assess of pulmonary manifestation in a patient with systemic lupus erythematous, using clinical evaluation, radiological studies (chest X-ray), and a spirometer.

Patients and Methods:

Study conducted at Diwaniyah Teaching Hospital.

Type of Study

Cross-sectional study

Data collection

Data was collected from 1st October 2021 to 25th April 2022.

Data was taken from the respiratory clinic – internal medicine clinic. All patients fulfilled one or more of the American Rheumatism Association criteria for SLE. Their sex, age, duration at disease, and types of medication were recorded. A detailed history was taken, including smoking history and drug history. Physical examination was performed to each patient.

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Specifically looking for features related to the respiratory system.
All patients send for: -

- Chest X-ray
- Spirometry

Statistical Analysis

- All data analyses were performed using a statistical package for social sciences. Means with standard deviations were calculated for quantitative data. Chi-square test was used to assess the association between categorical variable. A level of P-value less than 0.05 was considered significant.

Results

A total of 50 systemic lupus erythematosis patients were reviewed. Regarding table (2):
Mean age of the study was 25.9 ± 10.2 regard females and 31.1 ± 9.5 regard males.
Mean duration per year is 4.8 ± 2.9 regarding females and 2.1 ± 1.9 regarding males.

Table .1: Age, Gender & duration of illness for 50 patients.

	Mean ± S. D.	
	Female n = 42	**Male n = 8**
Age (yr)	25.9 ± 10.2	31.1 ± 9.5
Duration (yr)	4.8 ± 2.9	2.1 ± 1.9

Table. 2: Distribution of Patients according to Pul (clinical and radiological manifestations).

Pul. Manifestation	**No. & Percentage of Patients**				**Total**	**%**
Clinical Features	**Male**	**%**	**Female**	**%**		
Asymptomatic (N)	6	12 %	20	40 %	26	52 %
Dyspnea	-	-	10	20 %	10	20 %
Cough	1	2 %	6	12 %	7	14 %
Pleuritc chest pain	-	-	2	4 %	2	4 %
Sputum	1	2 %	3	6 %	4	8 %
Heamoptysis	-	-	1	2 %	1	2 %
Radiological Features						
(Normal	4	8 %	30	60 %	34	68 %
Plueral effusion	3	6 %	11	22 %	14	28 %
Basal pulmonary infiltrate	1	2 %	3	6 %	4	8 %
Shrinkage lung disease	-	-	1	2 %	1	2 %
(Uoremic pulmonary odema	-	-	1	2 %	1	2 %
Heald TB	1	2 %	1	2 %	2	4 %
Atlactasis	1	2 %	-	-	1	2 %

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Table 3: Show the distribution of patients according to the presence of pulmonary manifestation in both sexes.

I. There is 22 females with pulmonary manifestation and 2 males.
II. There is 20 females without pulmonary manifestation and 6 male.

Table 3: Distribution of patients according to presence pul. manifestation in both gender.

Sex	No. of P with pul. Manif.	No. of without pul. Manif.	Total	P. Value
Female	22 (52%)	20 (48%)	42	< 0.05 Significant
Male	2 (25%)	6 (75%)	8	
Total	24 (48%)	26 (52%)	50	

- Mean ESR with pulmonary manifestation was 65.10 ± 32.8 while in a patient without pulmonary manifestation was 69.84 ± 34.01.

Table 4: Distribution of p according to ESR Value, duration of illness & age of p with & without pull. Manifestations.

	Patient with pul. Manifestation	Patient without pul. Manifestation	P. VALUE
ESR (MM/HR)	65.10 ± 32.8	69.84 ± 34.01	Not Significant
DURATION O; F ILLNESS (YR)	4.3 ± 3.5	3.8 ± 2.99	Not Significant
AGE (YR)	24.82 ± 9.02	29.21 ± 13.12	Not Significant

Distribution of patients regarding the pattern of spirometers. There are 35 patients has restriction patterns from a total of 50 patients. 4 patients have an obstructive pattern from a total of 50 patients.

Table. 5: Distribution of patients according to the pattern of. spirometry.

Pattern of spirometery	Male	Female	Total	P. Value
Restrictive spirometery				

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+	32	3	35	< 0.05 Significant
-	10	5	15	
Total	42	8	50	
Obstructive spirometery				
+	2	2	4	< 0.05 Significant
-	40	6	46	
Total	42	8	50	

38 patients have positive spirometers.
12 patients have negative spirometers.

Table 6: Distribution of patients with or without pul. Manifestations according to abnormal spirometry.

Abnormal spirometery	**No. of P W Pul. Manifestations**	**No. of P W out Pul. Manifestations**	**Total**	**P. Value**
+	18	20	38	< 0.05 Significant
-	6	6	12	
Total	24	26	50	

Discussion

In our study, we found (48 %) of patients had respiratory symptoms. Shortness of Breath is the commonest symptom in 20% of patients in our study this was in agreement with other study of Gibson [17] who showed that shortness of breath is the commonest symptom in their study (53%) and Hellmont [18]. 60 % of the patient has shortness of breath. While Grennan and Holgat (19,20) found pleurtic chest pain was the commonest symptom in their patient (50%) of their patient. While other Iraqi study [Al – Izzi et al study [21] found pulmonary symptoms were reported in (46.3%) and the commonest pulmonary symptom were dyspnea and pleuritic chest pain each noted in (38.8%). 46% of our patients had abnormal CXR. 28% of our patients had pleural effusion. While Gibson et al [22] found 50 % of patients had abnormal CXR and high diaphragm was the commonest and abnormality at 28%. Also, Al – Izzi et al (21) found 39% of their patients had abnormal CXR and high diaphragm was a common abnormality at 20.4%.

In our study, there was no statistically significant difference in ESR, duration of illness, age of the patient, gender, and abnormal spirometry between those having pulmonary manifestation and those who are free of such manifestation. Also, there is no statistically between the two sexes regarding age, duration of illness, and pattern of spirometry this was in agreement with other study of Andrew Andonopoules. VC is significantly abnormal in form of predict value P < 0. 05. This is agreed with a stud of Andrew Andonoponls. [23]

The most common pattern of spirometry in our patient was a restrictive pattern in (35 patients) and this in consist with other studies of Grennon et al [23]. 63 % of their patients had a restrictive pattern. While Andrew Andonoponls found restrictive patterns uncommon (5.1 %) in their patient.

The reason why pulmonary abnormalities develop in patients with no overt symptoms or signs of lung disease remains unclear. Possible mechanisms include alveolar atelectasis perhaps due to a deficiency in surface film lining the alveoli resulting in hyaline membrane formation, diffuse interstitial fibrosis pleural disease, a

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primary myopathy of the diaphragm, and pulmonary vascular disease. Some or all of these mechanisms may be involved in an individual patient.

The triggering factor for all these mechanisms which are responsible for pulmonary abnormalities was immunological mediated by immune complex (and complement) mediated type III hypersensitivity reaction.

Conclusion

Most common pulmonary manifestations in systemic lupus erythematosis are dyspnea and pleural effusion. Abnormal spirometer results are more common in SLE than in the development of clinical and radiological manifestations. Restrictive patterns are more commen than obstructive ones.

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