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Research Article

PULMONARY SCREENING IN RHEUMATOID ARTHRITIS PATIENTS AT A TERTIARY HOSPITAL: AN OBSERVATIONAL STUDY FROM CENTRAL INDIA

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ABSTRACT

Background: Given that rheumatoid arthritis (RA) is an inflammatory systemic illness and that lung disease affects RA morbidity and mortality, it has been advised that asymptomatic RA patients be screened for pulmonary involvement.

Aims & objectives: In the current investigation, rheumatoid arthritis patients at a tertiary hospital underwent lung screening as part of an observational study.

Material and Methods: Patients who met the ACR EULAR (2010) criteria for rheumatoid arthritis and were older than 21 years old received pulmonary screening using physiological (a pulmonary function test) and radiographic methods in the current investigation, which was cross-sectional and observational in nature (chest X-ray, HRCT chest).

Results: 128 rheumatoid arthritis patients were assessed in the current study. 53.31 11.06 years was the average age. There were fewer male patients (26.6%) than female patients (73.4 percent). The majority of patients (60.9 percent) had RA illness for more than 10 years, had a normal BMI (45.3 percent), and did not smoke (59.4 percent). 14.1% of people smoked regularly. Cough (43.8 percent), shortness of breath (17.2%), sputum (14.1 percent), and wheeze were the most prevalent symptoms identified (7.8 percent). The majority of patients' X-ray chest findings (81.3%) were normal, followed by b/l lower zone haziness (14.1%) and significant pulmonary vasculature (4.7 percent).The majority of patients (73.4%) on HRCT exhibited normal findings, followed by ground glass pat (both lower lobes) (17.2%), sub pelural reticulations (10.9%), pleural thickening (3.1%), and pulmonary vascular prominence (3.1 percent). The majority of patients (65.6%) had normal results from pulmonary function tests, followed by patients who had restrictive changes (17.2%), obstructive changes (10.9%), and non-cooperative patients (6.3%).

Conclusion: Patients with rheumatoid arthritis who undergo pulmonary screening benefit from early diagnosis, treatment, and monitoring that lowers morbidity and death.

Keywords: Pulmonary screening, rheumatoid arthritis, chest X-ray, HRCT chest

INTRODUCTION:

The cause of rheumatoid arthritis (RA), a systemic inflammatory disease with severe morbidity and death that has a significant impact on both the use and cost of healthcare, is unknown[1]. Extra articular symptoms of RA can appear at any time, even before arthritis begins to develop. A prominent source of morbidity and mortality in this patient population is pleuropulmonary affection, which affects approximately 50% of RA patients[2]. Airways

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and pulmonary vasculature (bronchiolitis obliterans, vasculitis, and pulmonary hypertension) as well as respiratory tract infections are pulmonary manifestations of RA. Pulmonary parenchymal disease (Interstitial Lung Disease, Pulmonary Nodules), pleural inflammation (pleural effusion and thickening), and pleural inflammation are among these (RTI)[3,4]. Airway blockage, upper airway illness (Cricoarytenoiditis), bronchiectasis, and bronchiolitis obliterans are all examples of airway involvement. The typical respiratory signs of the patient are typically hidden by their poor functional status, which is a result of long-term systemic and articular inflammation and may lead to a delayed diagnosis[5]. Some specialists advise monitoring asymptomatic RA patients for pulmonary involvement due to the influence of lung illness on morbidity and death in RA[6].

Aims & objectives: In the current investigation, rheumatoid arthritis patients at a tertiary hospital underwent lung screening as part of an observational study.

MATERIAL AND METHODS

Present study was cross sectional, observational study, conducted in department of chest and tuberculosis at a medical college in Central India. A year was spent doing the study. The institutional ethical committee gave its clearance for the study.

Criteria for inclusion Patients who were willing to participate in the trial who were above 21 years old, of either sex, and who satisfied the ACR EULAR (2010) criteria for rheumatoid arthritis

Exclusion standards: Patients with a history of tuberculosis, inhalation exposure/occupational lung disease, obstructive pulmonary disease, cardiopulmonary illness, collagen vascular disease (SLE, scleroderma), viral infection (hepatitis B and C, HIV), hepatitis C, and scleroderma (asbestos, silica). respiratory disease sufferers those who suffer from coronary artery disease. those who have abnormalities in their thorax and spine. cases of rheumatoid arthritis in children. combined connective tissue disease patients.

The respiratory system received particular attention throughout the thorough clinical examination and history. A thorough medical history was obtained, including information on the length of the illness, different risk factors like smoking, gender, age, high RF and anti-CCP titres, and the clinical severity of the disease (as measured by the Clinical Disease Activity Index, or CDAI). Clinically, patients were assessed for respiratory symptoms and signs. Physiological (pulmonary function test) and radiographic techniques were used to further evaluate patients for pulmonary symptoms (chest X-ray, HRCT chest). CBC, urine microscopy, serum creatinine, serum electrolytes, LFTs, serum total proteins, and serum calcium are examples of routine studies. Sputum microscopy, C-reactive protein, ASO tires, and rheumatoid arthritis factor testing were performed. A chest x-ray, HRCT chest, and pulmonary function tests were completed. According to the ATS criteria, those with a FEV1/FVC ratio of less than 70% were classified as having obstructive disease; the severity of the condition was based on FEV1 decline. Restrictive disease was identified in patients with normal FEV1/FVC and decreased FVC (80%); the severity of the disease was based on the decrease in FVC. Sputum was tested for AFB in patients who had a clinical suspicion of tuberculosis to rule out pulmonary tuberculosis. To rule out pulmonary fibrosis secondary to viral infections, patients exhibiting evidence of pulmonary fibrosis on HRCT chest underwent further testing for HBsAg, anti-HCV, and HIV. Microsoft Excel was used to compile the data, and descriptive statistics were used for the statistical analysis.

RESULTS

128 rheumatoid arthritis patients were assessed in the current study. 53.31 11.06 years was the average age. There were fewer male patients (26.6%) than female patients (73.4 percent). The majority of patients (60.9 percent) had RA illness for more than 10 years, had a normal BMI (45.3 percent), and did not smoke (59.4 percent). 14.1% of people smoked regularly. Cough (43.8 percent), shortness of breath (17.2%), sputum (14.1 percent), and wheeze were the most prevalent symptoms identified (7.8 percent).

Table 1: Patient characteristic

	No. of patients / Mean±SD	Percentage
Age (years)	53.31 ± 11.06	
Gender		
Male	34	26.6%
Female	92	73.4%
Working status		
Work	74	57.8%
Non-work	54	42.2%
BMI (kg/m2)		
Normal	58	45.3%
Overweight	50	39.1%
Obese	20	15.6%
Smoking status		
Current smoke	18	14.1%
Ex-smoke	34	26.6%
Non-smoke	76	59.4%
Duration of the RA disease (years)		
<5	14	10.9%
05-10	36	28.1%
>10	78	60.9%
Any symptoms		
Cough	56	43.8%
Breathlessness	22	17.2%
Sputum	18	14.1%
Wheezing	10	7.8%

The majority of patients' X-ray chest findings (81.3%) were normal, followed by b/l lower zone haziness (14.1%) and significant pulmonary vasculature (4.7 percent). The majority of patients (73.4%) on HRCT exhibited normal findings, followed by ground glass pat (both lower lobes) (17.2%), sub pelural reticulations (10.9%), pleural thickening (3.1%), and pulmonary vascular prominence (3.1 percent). The majority of patients (65.6%) had normal results from pulmonary function tests, followed by patients who had restrictive changes (17.2%), obstructive changes (10.9%), and non-cooperative patients (6.3%).

Table 2: X-Ray chest, HRCT and pulmonary function test finding in RA patient.

Characteristics	No. of patients	Percentage
X-Ray chest		
Normal	104	81.3%
B/L Lower zone haziness	18	14.1%
Prominent Pulmonary vasculature	6	4.7%
HRCT		
Normal	94	73.4%
Ground glass pat (both lower lobes)	22	17.2%
Sub pelural reticulations	14	10.9%
Pleural thickening	4	3.1%
Pulmonary vascular prominence	4	3.1%
PFT		
Normal	84	65.6%
Restrictive	22	17.2%
Obstructive	14	10.9%
Not Cooperative	8	6.3%

DISCUSSION

Joints are severely affected by rheumatoid arthritis (RA), which can lead to physical function loss and potential deformity. Due to the disease's amelioration or exacerbation, RA symptoms can be unpredictable and have a big impact on patients' everyday life[7,8]. Because RA imposes restrictions that make physical exertion difficult, clinical signs of pulmonary insufficiency occur less frequently than the histological alterations; hence, respiratory involvement may remain silent. However, RA patients have a twice as high mortality rate from lung disease as the overall population. Since the majority of instances are discovered months or years after RA diagnosis and treatment beginning, the start of lung impairment and its association with rheumatic disease or potential drug toxicity remain debatable[9].Therefore, it is unclear if established fibrotic symptoms are present at diagnosis in the majority of interstitial lung disease (ILD)-RA cases. Previous research has revealed a link between RA activity and inflammation and the onset of lung disease[10]. In order to improve lung screening for RA patients, it may be helpful to identify the predictive indicators of pulmonary involvement. High titres of Rheumatoid factor (RF) and anti-cyclic citrullinated peptides (anti-CCP) are known risk factors for extra-articular symptoms of rheumatoid arthritis, including ILD. Age and smoking have also been found to be risk factors for the development of ILD. Regular interstitial pneumonia and nonspecific interstitial pneumonia are the most prevalent types of RA-associated ILD (RA-ILD). 33 of the 122 patients assessed for the study by Ganga B et al. had RA[11].

The PFT displayed both a restrictive and obstructive pattern, with a mean age of 40–50 years and a higher prevalence of women. The most frequent finding in all patients' HRCT patterns was a nonspecific interstitial pneumonia pattern. After 6MWT, the patients'desaturation and dyspnea worsened. The length of the disease is correlated with the extent of pulmonary involvement in RA. Early detection techniques that combine the PFT, 6MWT, and clinical assessment are economical[12]. A better understanding of the pattern of pulmonary involvement in RA is provided by HRCT. Cough was a more enduring symptom of RA with pulmonary involvement, affecting around half of the patients with pulmonary involvement (dry cough in 25 percent and productive cough in 21.4 percent).According to the findings of our study, lung crepitations were present in 64.3% of patients with ILD, indicating that they can be a very sensitive marker used to predict ILD in RA patients. 34 percent of the 100 individuals evaluated by Banotra P et al. exhibited lung involvement. On HRCT, ILD was found in 34% of the patients. The most frequent lung RA symptom was ILD. Males were twice as likely as females to have lung involvement. Longer sickness duration had a substantial effect. Smoking, clinically severe RA, high RF titres, and high anti-CCP titres were among the additional risk variables that our study revealed to be significant. In our investigation, UIP was the most typical ILD found in RA.

Progressing to pulmonary involvement is correlated with past cigarette smoking, male sex, the presence of rheumatoid factor, duration of sickness, and clinical severity of illness. Fatima N et al. studied 62 RA patients, finding that 40.3% of them had some pulmonary symptoms, including exertionaldyspnea (21%), cough with expectoration (17.7%), fine respiratory rales (11.3%), and bilateral lower zone haziness on X-rays of the chest (16%) and prominent pulmonary vasculature (3.2%)[13]. Restrictive, obstructive, and mixed PFT patterns were abnormal in 43 percent of the population, respectively. The most frequent abnormalities identified by HRCT were ground glass patterns in both lower lobes (19.3%), subpleural reticulations (9.6%), pleural thickening (3.2%), and pulmonary vascular prominence (1.6%).

Out of 50 cases in the study by Ravikumar P et al., the majority (70 percent) of cases were involving women who were between the ages of 31 and 40. (44 percent). The most prevalent respiratory symptom was dyspnoea (20%), followed by cough (14%) and wheezes (3%). (10 percent each). Rheumatoid factor and anti-CCP positivity were found in 76 and 82 percent of patients, respectively, with substantial correlation to PFT abnormalities. PFT abnormalities were seen in areas with substantial disease activity. Hyperinflation (36%) and interstitial pattern (28%) as well as volume loss were found on chest X-rays (08 percent). According to HRCT, the most prevalent findings in 86 percent of patients were bronchiectasis (34 percent), rheumatoid nodules (26 percent), and air trapping (20 percent).28 (56%) of the RA patients had

normal lungs, 8 (16%) had obstructive lungs, and 14 (28%) had restrictive lungs. In the current investigation, similar results were found[14]. 160 RA patients were evaluated by Nermeen S et al., with a mean age of 37.8 11.3 years and a disease duration of 4.98 5.53 years. Of these patients, 85% were female and 15% were male. Chest symptoms indicative of ILD were present in 50% of individuals. PFT showed abnormalities in 60% and HRCT showed abnormalities in 63.75%. Reticulation (66.6%) and a ground-glass look (64.7%) were the most prevalent HRCT findings, followed by bronchiectasis (50.9%) and honeycombing (46 percent). The most frequent HRCT subtype was typical interstitial pneumonia (UIP) (49 percent) [15-17].

Patients with RA-ILD exhibited significantly higher DAS28 and Sharp scores, longer disease duration, more frequent arthritis, significantly higher rheumatoid factor, and anti-citrullinated protein antibody levels than non-RA patients (ACPA)[18]. Interstitial lung disease (ILD), a progressive fibrotic illness of the lung parenchyma, is the most prevalent and major of the many pulmonary symptoms and considerably increases morbidity and death[19]. Rheumatic disorders may negatively impact lung functioning and aerobic capacity.

CONCLUSION

Patients with rheumatic disease frequently experience lung problems, which can significantly increase morbidity and mortality. Patients with rheumatoid arthritis who undergo pulmonary screening benefit from early diagnosis, treatment, and monitoring that lowers morbidity and death. The importance of physical activity in rheumatic diseases is demonstrated by the negative effects of the musculoskeletal system limitations and the positive reflections of functional wellness on the pulmonary system, which shows that aerobic exercises should be emphasized especially in RA patients with low aerobic capacity.

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