
PLEUROPULMONARY COMPLICATIONS OF RHEUMATOID ARTHRITIS

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ABSTRACT

Rheumatoid Arthritis (RA) is a chronic systemic disease with decreased physical function. It is characterised by both articular and extra-articular manifestations. Pulmonary involvement is common and its complications are a leading cause of death in patients with RA. The present study was undertaken with the objective of analysing the incidence and severity of pleuro pulmonary complications in RA. A cross-sectional study on 36 patients with RA was carried out along with a detailed history, general and systemic examination. A blood picture showing C-Reactive protein and Rheumatoid factor were also done confirm the presence of the disease. Results were analysed using percentages and proportions and significance value. The study has shown that RA is predominantly and significantly ($p=0.007$) high in females in their fourth decade of life. However, respiratory abnormalities were found to be higher in males than female patients. Dyspnoea, cough and wheeze were among the common complaints whereas pleural rub was the most common clinical finding on examination. Early detection of respiratory involvement is interfered with due to physical deconditioning of the patient due to joint involvement.

Keywords: Rheumatoid arthritis, pleuro pulmonary complications, extra-articular manifestations

1. Introduction

Rheumatoid Arthritis (RA) is a highly inflammatory chronic systemic disease with diminished physical function and premature mortality¹⁻⁵. It is characterized by the presence of both articular and extra-articular manifestations. Patients with high titres of Rheumatoid Factor are likely to develop extra-articular manifestations of RA with significant morbidity and mortality^{6,7}. The extra-articular manifestations can occur at any age after the onset of illness. Interstitial lung disease and pleural effusion are the most common forms of lung involvement.

Pulmonary complications are a leading cause of death in patients with RA⁸. Chronic obstructive pulmonary disease with both restrictive lung disease and obstructive lung disease produce clinical symptoms^{9,10}. The systemic nature of the disease is manifested by a variety of extra-articular features resulting from involvement of heart, lungs, pleura, eyes etc. Pulmonary involvement in rheumatoid arthritis is common and may occur as chronic pleuritis, diffuse interstitial pneumonitis and fibrosis, intra pulmonary rheumatoid nodules¹¹⁻¹⁴. Screening of such patients is highly recommended and the

most sensitive method to detect ILD is HRCT of chest but is associated with limitations due to radiation exposure to the patients¹⁵. Pulmonary function tests if complimented with proper clinical examination would be of more value in diagnosing the disease. As screening by HRCT and pulmonary function testing has its limitations due to the costs involved, clinicians depend on development of respiratory symptoms and physical findings. However, this approach delays identification of patients early in the disease and poses a difficulty in selecting therapeutic agents for the lung disease.

The present study was taken up to analyse the incidence and severity of pleuro-pulmonary complications and their association with Rheumatoid Arthritis.

2. Material and Methods

A cross-sectional study was carried out in the Department of Medicine, Global Hospital, Hyderabad from July 2010 to November 2011. Thirty six patients of Rheumatoid arthritis were included in the study. All the patients were diagnosed as Rheumatoid Arthritis on the basis of American Rheumatism Association 1987 revised classification criteria. A detailed history

was taken. Thorough general and systemic examinations were carried out with special regard to joint involvement, swelling, tenderness and extra-articular manifestations. Laboratory assessments like complete blood picture, C-Reactive protein (>1mg/dl), Rheumatoid Factor (>20IU/ml), pleural fluid examination in patients with effusion, chest x-ray, High Resolution Computerized Tomography (HRCT) of thorax, pulmonary function test and electrocardiogram were done to confirm the presence of the disease. An informed consent was taken from the subjects and the Institutes Ethics Committee permission was also obtained.

3. Observations and Results:

Statistical Analysis: Done using percentages and proportions

3.1. Female to male ratio:

Female	Percentage	Male	Percentage	Ratio
25	69.5	11	30.5	2.27/1

Thirty six cases of RA were selected for the study. Out of 36 cases, majority (69.5%) of cases were females (25) and 30.5% were males (11) with a female to male ratio 2.27:1.

3.2. Age and sex distribution of cases:

Age (Yrs)	Male	Female	Total	Percentage (n=36)
21-30	0	0	0	0
31-40	3	12	15	41.7
41-50	6	8	14	38.9
51-60	2	3	5	13.9
Above 60	0	2	2	5.5
total	11	25	36	100

No cases were recorded below 30 years of age. Most of the patients from both sexes belonged to the age group of 31 to 40 years (41.7%). More than 50% of the male patients presented with the disease in their 4th decade of life (p=0.058). The prevalence of the disease in females in their fourth decade was found to be statistically significant in comparison their male counterparts (p = 0.007).

3.3. Duration of illness:

Duration	No. of cases	Percentage (n=36)
<1to 5 years	10	27.7
5 to 10 years	15	41.7
10 to 15 years	6	16.7
>15 years	5	13.9

Most of the patients (41.7%) had their duration of illness between 5 to 10 years. 27.7% of patients had duration between 1 to 5 years. Mean disease duration was 8.1 years.

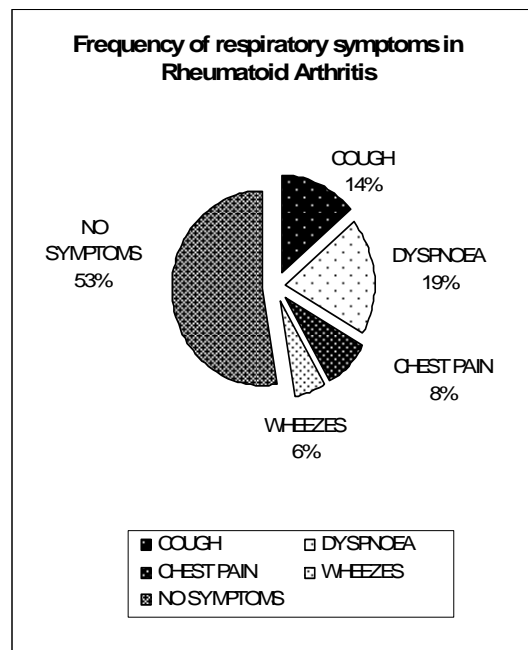
3.4. Frequency of presenting symptoms on admission

Presenting symptoms	Number of cases	Percentage (n= 36)
Morning stiffness	36	100
Joint pain	36	100
Joint swelling	36	100
Deformity	14	39
Cough	5	14
Dyspnoea	7	19.4
Chest pain	3	8.3
Wheezes	3	8.3

Morning stiffness, joint pain and swelling were present in all the cases.

Among respiratory symptoms, dyspnoea was the most common presenting symptom (19.4%).

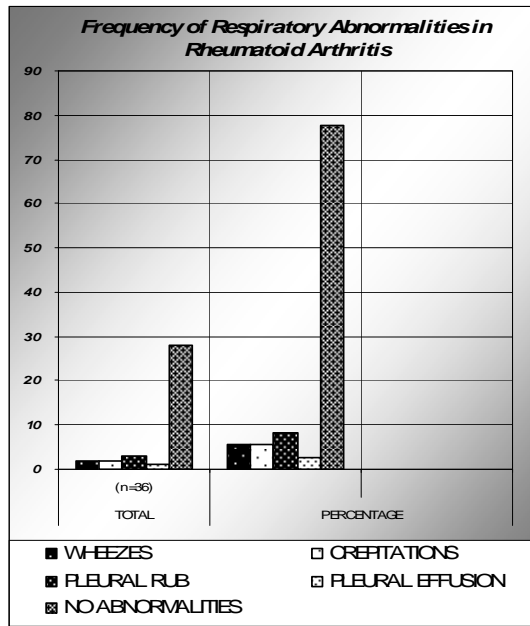
Others were cough (14%), chest pain and wheezes (8.3% each).



3.5. Frequency of clinically detected respiratory abnormalities

Abnormalities	Male	Female	Total	% (n=36)
Wheeze	2 (5.6%)	0	2	5.6
Crepitations	0	2 (5.6%)	2	5.6
Pleural rub	2 (5.6%)	1 (2.7%)	3	8.3
Pleural effusion	0	1 (2.7%)	1	2.8
No abnormalities	7 (19.%)	21 (58.3%)	28	77.7

Pleural rub was the most common clinically detected abnormality (8.3%) and was more so in male patients (5.6%) in comparison to female patients (2.7%), followed by wheeze and crepitations (5.6% each). Only 2.7% of the patients had pleural effusion. Radiological evidence of Interstitial lung disease was found only in 5.6% of the patients.



4. Discussion:

Rheumatoid Arthritis is one of the common connective tissue disorders affecting almost all the systems of the body including the lungs and airway disease might be the most prevalent pulmonary manifestation of RA¹⁶. The patients are predominantly females which are in accordance with previous studies done on RA. The incidence of respiratory abnormalities was higher in male patients (36.3%) when compared to female patients (16%) as reported previously by Walker WC, Lillington GA and Petterson T^{17,18,19}.

47.3% of the patients had respiratory symptoms on admission. Previous studies as done by Byrd SL, Boulware DW and Morrison SC have shown a high incidence of pleural effusion among patients suffering with RA^{11,13,14}. Similarly, in the present study, the incidence of pleurisy was highest (11.1%) out of which 2.8% had pleural effusion and 8.3% had pleural rub. Among respiratory symptoms, dyspnoea was most common (19.4%) followed by cough (14%). These findings correlate with studies done previously by Geddes DM and Colleagues²¹. Shortness of breath in patients with Rheumatoid Arthritis was probably due to

airway obstruction with abnormal lung function tests that is most marked when respiratory volumes are low and trapping of air occurs.

Pleural effusion at times is asymptomatic, possibly because physical activity in these patients was limited due to morning stiffness and joint pain as was observed in earlier studies. As patients with RA are physically deconditioned, recognition of respiratory symptoms is interfered with. In the present study we found that 77.7% of the patients were asymptomatic. However, some patients presented with cough, dyspnoea and pleural rub which is due to presence of pleural effusion and airway obstruction similar to the study done by Stanek KA and Mills KA²⁰. Rheumatoid factor concentrations also are found to be higher in patients with pleural effusion.

Pleural fluid examination revealed low glucose (18mg %) and high protein (3.4gm %) concentrations which is in accordance with studies done earlier by Lillington GA, Carr DT, Mayne JG¹⁸.

Other less common pleuro-pulmonary manifestations of rheumatoid arthritis like rheumatic nodules, Caplan's Syndrome, upper zone fibrosis, cavitation and upper airway obstruction were observed in few cases but not taken into consideration due to drop out of such cases during the course of the study.

In contrast to some previous studies, patients with clinically apparent cardiovascular diseases were excluded so that the reported respiratory symptoms truly reflected lung disease.

Conclusion:

In Rheumatoid Arthritis, lung disease has an impact on morbidity and mortality of patients. The study suggests that pulmonary complaints and physical findings are more common in patients with documented lung disease than in patients without. However, screening of asymptomatic RA patients for pulmonary involvement is also highly recommended by experts.

Early identification and timely therapeutic intervention in patients with RA might improve quality of life and performance status of the individual. The findings from the present study could be of clinical benefit if performed and confirmed on a larger population.

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