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PULMONARY FUNCTION TEST IN RHEUMATOID ARTHRITIS PATIENTS

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Abstract :
Background Rheumatoid arthritis (RA) is a systemic disease manifested as a symmetric polyarthritis .This is the most common inflammatory arthritis affecting 0.5-2percentage of the worlds population frequently in the 25-55 year old age group and has female predominance . Lung involvement is a common extra-articular manifestation of RA conferring significant morbidity and mortality. Our study is focused to find out the pulmonary function in Rheumatoid arthritis patients and it is compared to normal subjects.Materials and Methods A cross sectional case control study was conducted among 30 patients with RA in the age group of 30-50 years and disease duration of 3-5 years. Patients satisfying the 2010 ACR-EULAR criteria of rheumatoid arthritis were selected for the study. 30 healthy subjects were selected for the control group. General examination done and the height and weight were measured. Pulmonary function testing is done by Spirometer. Parameters Forced vital capacity (FVC), Forced expiratory volume during first second (FEV1) and FEV1FVC were compared between both the study groups. Students T test was carried out to compare the means of variables between RA patients and normal subjects. Statistical analysis was done using the SPSS (Statistical Package for the Social Sciences) software version 7.5 and p value 0.05 was taken as significant.ResultsThe mean values of FVC of Rheumatoid arthritis patients were significantly lower than the normal subjects and the mean values of FEV1 of RA patients were also significantly lower than the controls .Hence, restrictive pattern of lung dysfunction is common in RA patients according to our study.Conclusion An adequate screening tool that could easily be integrated into clinical care would represent a critical step in early identification and treatment of these conditions. So, it is important to do the Pulmonary Function Test in order to detect and monitor changes in lung function in subjects with rheumatoid arthritis.

Keyword : Pulmonary function test, Rheumatoid Arthritis, Forced Vital Capacity, Forced Expiratory Volume.

INTRODUCTION:

Rheumatoid arthritis (RA) is a systemic disease manifested as a symmetric polyarthritis usually in the setting of elevated auto antibodies (Rheumatoid factor) [1] .This is the most common inflammatory arthritis affecting 0.5-2% of the world's population frequently in the 25-55 year old age group and has female predominance (2.5:1). Nearly 50% of patients with RA demonstrate some type of extra- articular manifestation of the disease[2] . Lung involvement is a common extra-articular manifestation of RA[3] conferring significant morbidity and mortality. It is seen in 30% of the cases. Lung disease is the second most common cause of death following infection. There are many forms of lung disease in RA including **interstitial fibrosis, bronchiolitis** and **small airway diseases** [4].

Clinical symptoms of pulmonary insufficiency occur less frequently than the histological changes and the respiratory involvement may be asymptomatic. However, the mortality rate from pulmonary disease in RA is twice that of the general population [5] .In clinical practice, pulmonary function testing is used most commonly to estimate prognosis, follow the course of the disease or the response to therapy, detect untoward reaction to drugs and to assess functional impairment or disability [6, 7].

MATERIALS AND METHODS:

1. Thirty patients with RA in the age group of 30-50 years and disease duration of 3-5 years are selected for the study. Thirty healthy subjects are selected for the control group.

INCLUSION CRITERIA:

1.€€€€€ Patients satisfying the 2010 ACR-EULAR criteria of rheumatoid arthritis€€€€€€€

1. Age group of 30-50 years

1.€ € Duration of disease of 3-5 years.

EXCLUSION CRITERIA:

- €Subjects with coronary artery disease
- Smokers
- €Subjects with thoracic abnormality
- € Subjects with vertebral abnormality
- € Patients with history of occupational lung disease and other connective tissue diseases

The participants were made to relax and be comfortable prior to the tests. Detailed clinical history about RA was recorded. General examination done and the height and weight were measured. General and systemic examinations pertaining to respiratory and cardiovascular system were done and findings were recorded. Pulmonary function testing is done by Spirometer.

RESULTS:

All the RA Patients included in the study satisfied the 2010 ACR/EULAR criteria. The mean duration of the disease is 4.07± 0.46 years. Parameters –Forced vital capacity (FVC), Forced expiratory volume during first second (FEV1) and FEV1/FVC were compared between both the study groups. Student's T test was carried out to compare the means

of variables between RA patients and normal subjects. Statistical analysis was done using the SPSS (Statistical Package for the Social Sciences) software version 7.5 and the results are given in tables1-3 and graphs 1-3.

Table 1- Comparison of mean values of FVC in the study groups

Groups	FVC (Mean ± SD in litres)	p value
Controls	3.68 ± 0.48	0.00*
RA Patients	3.03±0.53	

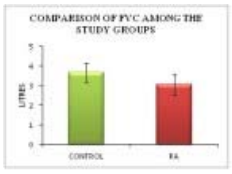
Table 2- Comparison of mean values of FEV1 in the study groups

Groups	FEV 1(Mean ± SD in litres)	p value
Controls	3.41±0.42	0.00*
RA Patients	2.74±0.39	

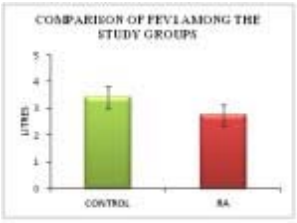
Table 3- Comparison of mean values of FEV1/FVC in the study groups

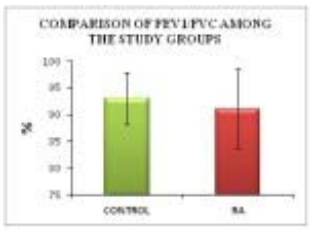
Groups	FEV1/FVC(Mean ± SD)	p value
Controls	93.06±4.80	0.223
RA Patients	91.06±7.46	

Graph 1 Graph 2:



Graph 3 :





DISCUSSION:

Timely recognition of the pulmonary manifestations of RA is critical as the respiratory pathology is the second leading cause of mortality in patients with RA. Restrictive pattern is the most common pattern in our study and similar results were found in other studies. Rajasekran [8] performed a study on 18 patients of rheumatoid arthritis and found out that about 60% of patients showed restrictive pattern in his study on spirometric tests. Youssef [9] performed a study to investigate the prevalence and types of pulmonary involvement using high-resolution computed tomography scan (HRCT) and pulmonary function tests (PFT) and to evaluate the association between respiratory symptoms and rheumatoid lung disease in a group of Egyptian rheumatoid arthritis patients. He found that nearly 64% of RA patients demonstrated abnormalities on spirometry and 47% on high resolution computed tomography. Mixed restrictive and obstructive pattern was the commonest findings in all patients by both spirometric tests and HRCT methods with predominance of restrictive pattern in most of patients and both of these methods were significantly correlated with each other with p value($p<0.05$). Schrenthaner [10] conducted a study on 62 patients of rheumatoid arthritis. The patients were subjected to spirometric function test analysis. It was found that lung dysfunctioning goes on increasing as duration of disease increases with predominance of restrictive pattern.

CONCLUSION:

An adequate screening tool that could easily be integrated into clinical care would represent a critical step in early identification and treatment of these conditions. So, it is pertinent to do the Pulmonary Function Test in order to detect and monitor changes in lung function in subjects with rheumatoid arthritis.

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