

# European Respiratory Society Annual Congress 2013

**Abstract Number:** 3661

**Publication Number:** P3815

**Abstract Group:** 1.5. Diffuse Parenchymal Lung Disease

**Keyword 1:** Interstitial lung disease (connective tissue disease) **Keyword 2:** Bronchiolitis **Keyword 3:** Imaging

**Title:** Differences in chest HRCT between smoking and non-smoking rheumatoid arthritis patients with abnormal spirometry

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**Body:** INTRODUCTION: Smoking exposure is frequent in Rheumatoid Arthritis (RA) patients, but its role on RA lung disease is unknown. Obstructive lung disease may be secondary to cigarette smoking rather than to RA per se, but its frequency is still high in non-smokers with RA. AIM: To compare and detect differences on chest high-resolution computed tomography (HRCT) between non-smoking RA patients and former or current smoking RA patients. METHODS: Smoking and non-smoking RA patients with abnormal spirometry were submitted to chest HRCT. Readers classified patients in different lung patterns. RESULTS: 61 RA patients with abnormal spirometry were analyzed, and 30 were non-smokers (49%). A total of six HRCT were considered normal or near normal, five in non-smokers. There was only one usual interstitial pneumonia and one non-specific interstitial pneumonia pattern. 17% non-smoking and 52% smoking patients were diagnosed as having chronic obstructive lung disease pattern (COPD) ( $p=0.002$ ). 37% non-smoking and 19% smoking patients were diagnosed as RA-related airways disease pattern ( $p=0.06$ ). Air trapping, bronchial wall thickening, and emphysema were observed in 47%, 80%, and 20% non-smoking patients, respectively; and in 45% ( $p=0.45$ ), 87% ( $p=0.22$ ), and 52% ( $p=0.005$ ) smoking patients, respectively. CONCLUSIONS: There was a statistically significant higher prevalence of COPD diagnosis in RA smoking patients than RA non-smoking patients, but COPD diagnosis was frequent in non-smokers. Emphysema was less frequently observed in non-smoking RA patients, but no pattern or HRCT abnormality could accurately differentiate between smoking and non-smoking RA patients with abnormal spirometry.