

**Cigarette Smoking and Disease Activity in Rheumatoid Arthritis Patients: Results from Ontario Best Practice Research Initiative (OBRI)**

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**Objective:** Smoking has been shown to be a significant risk factor for developing rheumatoid arthritis; however its impact on disease activity has conflicting evidence. The aim of this study was to assess the effect of smoking on disease activity in rheumatoid arthritis (RA) patients.

**Methods:** Data from the Ontario Best Practices Research Initiative (OBRI), a clinical registry of RA patients followed in routine care, were examined. All patients whose smoking status was reported at baseline were included in the study. Patients were divided into three groups based on their smoking status: Never, Past and Current smokers. The demographic, clinical laboratory and therapeutic features were compared according to their smoking habits. Physician reported disease activity measures such as tender joint counts (TJC), swollen joint counts (SJC), disease activity score 28 joints (DAS28), clinical disease activity index (CDAI) and patient reported disease activity score of rheumatoid arthritis disease activity index (RADAI) were considered as the outcomes. Differences between the groups were compared using chi-square test for categorical parameters, or analysis of variance (ANOVA) for continuous parameters. Multivariable analysis was performed for each outcome to assess the impact of smoking on disease activity when adjusted for potential confounders including patient demographics and rheumatoid factor (RF). When there was an overall difference in an outcome according to smoking status, Tukey-adjusted pair wise comparisons were made between groups.

**Results:** A total of 2,090 patients with a mean (SD) age 57.3 (12.9) years were included in the study and 77% were females. There were 343 (16.4%) current smokers (men-22.1% and women-14.8%), 812 (38.9%) past smokers (men-50.5% and women 35.5%) and 935 (44.7%) never smokers (men-27.4% and women- 49.7%) in the cohort. A significantly higher proportion of RF positives were found in current smokers (76.7%) compared to past (70.9%) and never smokers (64.5%),  $p=0.0003$ . More DMARDS and less biologics were used at baseline in smokers; however it was not statistically significant. Current cigarette smokers found to have significantly higher mean TJC (7.4 vs. 6.3,  $p< 0.001$ ), SJC (7.1 vs. 6.4,  $p< 0.001$ ), CDAI (24.3 vs. 21.5,  $p< 0.001$ ), and RADAI (4.5 vs. 3.7,  $p< 0.001$ ) than non-smokers, after adjusting for patient sex, age and RF. There was no difference in DAS28 scores between the groups.

**Conclusion:** Smokers have worse disease activity outcomes than non-smokers in RA patients, after adjusting for measured confounders.