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IMPACT OF TNF INHIBITORS ON NEED FOR JOINT REPLACEMENT IN PATIENTS WITH RHEUMATOID ARTHRITIS: A MATCHED COHORT ANALYSIS OF UK BIOLOGICS REGISTRY DATA

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Background: Previous ecological data from the UK and Denmark suggest a decline in the incidence of joint replacements for RA patients following the introduction of tumour necrosis factor inhibitors (TNFi). However, patient-level data on the comparative effectiveness of TNFi compared to conventional synthetic DMARD (csDMARD) use on the need for total hip (THR) or knee (TKR) replacement are lacking.

Objectives: To estimate the impact of TNFi use on subsequent need for THR or TKR (primary outcomes) or other joint replacement (OJR) (secondary outcome) in RA.

Methods: A propensity score (PS) matched cohort was analysed using the British Society for Rheumatology Biologics Registry (2001 – 2016) for Rheumatoid Arthritis (BSRBR/RA) data. Exclusion criteria were: previous THR or TKR (all analyses) or OJR (secondary analysis), less than 6 months follow-up, prevalent biological DMARD use, or first biological DMARD use that was not a TNFi. Patients were followed from date of registration up to the earliest of date of outcome, death, loss-to-follow-up or change of TNFi exposure status (stopping, switching or starting). Multiple imputation was used to deal with missing data. The PS (i.e. the probability of receiving TNFi conditional on observed characteristics) was estimated using logistic regression. This included age, gender, ethnicity, index of multiple deprivation, BMI, smoking, year of registration, duration of RA, DAS-28, HAQ, SF36, ACR criteria, comorbidities, and comedications. A PS caliper of 0.2 was used to match all TNFi users to csDMARD users (with replacement) using a 1:1 ratio. Weighted Cox regression was used to estimate the impact of TNFi use on study outcomes, adjusted for any confounders that remained unbalanced.

Results: Our 1:1 matched cohort contained a total of 19,116 patient records. THR rate was 6.30/1,000 PYs [95% CI: 4.24-9.76] and 5.22/1,000 PYs [CI: 4.66-5.88] in the csDMARD and TNFi cohorts, respectively. TKR rate was 8.09/1,000 PYs [CI: 5.32-12.89] and 8.89/1,000 PYs [CI: 8.13-9.72], respectively. There was no significant association between TNFi use and THR or TKR (HRs = 0.86 [CI: 0.60-1.22] and 1.11 [CI: 0.84-1.47], respectively), although when analyses were restricted to patients with DAS >5.1 (as per NICE guidance) these HRs were 0.74 [CI: 0.51 - 1.05] and 0.95 [CI: 0.71-1.26], respectively. Among those over 60 years old, TNFi

was associated with a significant reduction in THR (HR= 0.60 [CI: 0.41 - 0.87] but not TKR (HR= 1.31 [CI: 0.87 - 1.99]). THR but not TKR rates were also reduced among those with an above average HAQ score. Overall, no significant associations were found for OJR.

Conclusions: Our findings suggest TNFi use may reduce the need for THR in older and more severe RA patients, although no evidence was found for a reduction in younger or less severe patients or in rates of TKR or OJR. Further work is needed to confirm these results.

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