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COMPARATIVE EFFECTIVENESS OF TUMOUR NECROSIS FACTOR INHIBITOR THERAPY VS. CONVENTIONAL SYNTHETIC DMARDS ON NEED FOR JOINT REPLACEMENT AMONG RHEUMATOID ARTHRITIS PATIENTS: A PROPENSITY SCORE MATCHED ANALYSIS OF UK REGISTRY DATA

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Background:

Previous ecological data suggests the incidence of joint replacement has declined among rheumatoid arthritis (RA) patients following approval of tumour necrosis factor inhibitors (TNFi). However, patient-level data on TNFi use and need for total hip (THR) or knee (TKR) replacement are lacking.

Objective:

To estimate the comparative effectiveness of TNFi compared to conventional synthetic disease modifying anti-rheumatic drug (csDMARD) use on subsequent need for THR or TKR (primary outcomes) or other joint replacement (OJR) in RA.

Methods:

A propensity score (PS) matched cohort was analysed using British Society for Rheumatology Biologics Registry for RA (BSRBR/RA) data (2001 - 2016). Multiple imputation was used to deal with missing data. The PS (i.e. 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 incident TNFi users to csDMARD users (with replacement) with a 1:1 ratio. Weighted Cox regression was used to estimate the impact of TNFi use on study outcomes, adjusted for any remaining unbalanced confounders (SMD>0.1).

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 above average HAQ score. 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 reduction was seen for TKR or OJR. Further work is needed to confirm these results.