Joint Replacement surgery is associated with decreased morbidity and mortality risk in patients with symptomatic hip and knee osteoarthritis.

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INTRODUCTION: Total Joint Replacement (TJR) or joint arthroplasty is successful in alleviating symptoms of osteoarthritis (OA). However, the overall health effects of TJR compared to non-operative management of symptomatic hip and knee osteoarthritis remain poorly understood. Long considered to be a "wear and tear" arthropathy, the pathogenesis of OA is now known to be mediated by inflammation. Chronic systemic inflammation has been implicated in increased morbidity and all-cause mortality risk. Therein, the potential of OA mediated inflammation at the joint to influence systemic inflammation and overall health in our patients warrants consideration. Furthermore, the surgical excision of the inflammatory nidus of OA joint tissues during TJR may offer an extended health benefit. Therefore, the objective of this study was to investigate the impact of TJR on mortality risk in patients diagnosed with osteoarthritis compared with nonoperative treatment.

METHODS: A retrospective cohort study utilized a propensity score–matched analysis of data from the TriNetX Global Database, including patients diagnosed with osteoarthritis of the hip or knee between January 1, 2005, and January 1, 2020. Propensity matching included demographics and comorbidity including the constituents of the Charlson comorbidity index. The cohort was divided into 2 groups: patients who were treated with arthroplasty surgery (TJR) and patients who were treated nonoperatively (NonOp). The primary endpoint was defined as all-cause mortality risk. Secondary end points included morbidity (major cardiac events, delirium, cerebrovascular accident) and captured biomarkers of systemic inflammation including C reactive protein (CRP) and erythrocyte sedimentation rate (ESR). Data analyses were completed September 22, 2025.

RESULTS SECTION: A total of 2,765,486 patients were included (218,901 TJR and 2,546,585 NonOp). After propensity matching, a total of 217,717 patients with similar characteristics (mean [SD] age, 64.9 [10.7] vs 64.7 [10.9] years; 88,561 [40.7%] male vs 88,910 [40.8%] male) and Body Mass Index (BMI) 31.6 [6.4] vs 31.7 [4] kg/m2 at follow up 4.3 [1.4] vs 4.2 [1.4] years were analyzed. Total joint replacement was associated with a significantly lower risk of all-cause mortality (hazard ratio [HR], 0.71; 95% CI, 0.69-0.73). Significant reductions were also observed for major cardiac events (HR, 0.89; 95% CI, 0.87-0.90), delirium (HR, 0.8; 95% CI, 0.77-0.83) and cerebrovascular accident (HR, 0.81; 95% CI, 0.79-0.82) and. CRP and ESR levels measured in TJR patients during follow up period were also lower; CRP 22.7 [46.6] vs 24.12 [48.8] mg/L ($p<0.001$) and ESR 23.9 [22.6] vs 24.4 [23.4] mm/h ($p=0.008$).

DISCUSSION: Utilizing a big data retrospective cohort study analysis, we observed a significantly lower all-cause mortality risk in patients treated with joint replacement compared to those treated non-operatively for symptomatic osteoarthritis of the hip and knee. In addition, we observed lower risk of morbidity defined by the incidence of major cardiac adverse events, delirium and cerebrovascular accident during the follow up period. This finding is particularly compelling since the follow up period included the immediate post operative period in the TJR patients, known to be of heightened risk. Biomarkers of systemic inflammation were lower in the TJR group but were overall high in both groups. CRP and ESR are not routinely drawn in the context of health surveillance and these captured data may be more reflective of acute medical events rather than a surrogate of chronic systemic inflammation.

SIGNIFICANCE/CLINICAL RELEVANCE: The findings of this large retrospective cohort study support the concept that joint replacement surgery may support wider health benefit, including a mortality benefit, in the treatment of osteoarthritis. Ultimately, prospective investigation of the potential mechanisms responsible for these observations, including any effect(s) on systemic inflammation, are warranted.