Intra-articular Knee Injections for Osteoarthritis and the Likelihood of Progression to Total Joint Replacement

Joseph Panos, Eric Twohey, Shelby Elizabeth Johnson, Brennan Boettcher, Mario Hevesi, Aaron John Krych, Christopher H Evans, Jacob Sellon, Christopher Nagelli

INTRODUCTION: Intra-articular injections are commonly used to manage pain in knee osteoarthritis but have been associated with disease progression. Therefore, the purpose of this study was to determine how the likelihood of total joint replacement (TJR) changes with serial intra-articular injection of corticosteroid and viscosupplementation for patients with knee osteoarthritis.

METHODS: This population-based cohort study included patients aged 40 to 60 years receiving an initial intra-articular injection of corticosteroid and/or viscosupplementation from January 1, 2000 through December 31, 2010 who resided in Olmsted County, Minnesota. Cox proportional hazards regression models were used to evaluate the likelihood of TJR based on the number of intra-articular injections. The primary outcome of this study was likelihood of TJR by number of intra-articular injections received. Secondary outcomes incorporated baseline knee osteoarthritis Kellgren-Lawrence (KL) grade, measured at the time of initial intra-articular injection, and type of injectate (corticosteroid or viscosupplementation) into the likelihood of subsequent TJR. Mean follow-up after initial intra-articular injection was 16 years.

RESULTS: A total of 1897 patients (n=2336 knees) who received a total of 8600 injections (5786 corticosteroid and 2814 viscosupplementation injections) were included in the study (mean [SD]: age 51.9 [5.5] years; 64.9% women; mean body mass index (BMI) 34.8 [8.0]), and 917 (39.3%) subsequently underwent TJR. Accounting for age, BMI, and KL grade, the number of intra-articular injections was associated with a higher likelihood of TJR (HR 1.12 [1.08-1.17]). Controlling for these same risk factors and stratifying by injection type (corticosteroid versus viscosupplementation), the likelihood of TJR with number of injections was not significantly different for corticosteroid (HR [95% C.I.]: 1.14 [1.07-1.22]) versus viscosupplementation (HR: 1.15 [1.11-1.20]). However, in patients with KL grade 0-1 osteoarthritis, the likelihood of subsequent TJR was greater with corticosteroid (HR: 1.27 [1.17-1.37]) versus viscosupplementation (HR: 1.12 [1.06-1.19]).

DISCUSSION AND CONCLUSION:

In this cohort study of patients with symptomatic knee osteoarthritis, each successive intra-articular injection was associated with a 12% increase in the likelihood of TJR. Corticosteroid injections were associated with a greater likelihood of TJR versus viscosupplementation in patients with early osteoarthritis. While it is unknown if this is a causative relationship, clinicians and patients should be cognizant of the cumulative risk of TJR with repeated intra-articular injections in knee osteoarthritis management.