

Does Intra-articular Ketorolac and Corticosteroid Provide Similar Pain Relief in Knee Osteoarthritis? A Randomized Controlled Double-Blind Study

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INTRODUCTION:

Knee osteoarthritis is a disabling disease seen in the elderly population that often requires total knee arthroplasty at a later stage, entailing the expenditure of billions of dollars for the economy. Intra-articular corticosteroid injection is one of the most accepted non-operative treatment modalities, beneficial in the mild-moderate grade of the disease, and is also helpful in delaying the surgery for those who are not ready for surgical management. However, concerns regarding the increased chances of infections and chondral damage with corticosteroid injections have started the search for other pharmacological agents which are safe and at least equally efficacious for the disease. Ketorolac injection, being a non-steroidal anti-inflammatory drug with a different mode of action than the corticosteroid, as well as a cheaper drug, has received heightened interest as a nonoperative treatment modality for knee osteoarthritis with potentially fewer safety concerns. However, there is very limited good-quality evidence to evaluate ketorolac's safety and short-term efficacy in knee osteoarthritis.

METHODS: It was a single-center double-blinded randomized controlled trial. The severity of the knee osteoarthritis was assessed using Kellgren Lawrence grading (KL grading). Patients with KL grades 1-3 were included in the study. The ketorolac group received an intra-articular injection of 30 mg Ketorolac mixed with 5 ml 0.5% Ropivacaine, while the corticosteroid group received an intra-articular injection of 80 mg methylprednisolone mixed with 5 ml 0.5% Ropivacaine. Knee pain was assessed using a 10-point Visual Analogue Scale (VAS) score at baseline, 2 weeks, 6 weeks, and 3 months. Functional outcomes were evaluated using patient-reported outcome measures (PROMs)- Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score, 36-Item Short Form Survey (SF-36) score, and Knee Injury and Osteoarthritis Outcome (KOOS) score; each of the scores was evaluated at baseline and 3 months. The primary outcome measure was knee pain relief provided by the intra-articular injection at 6 weeks. The secondary outcome measures were improvement in functional outcome at 3 months, and any complications recorded at 3 months. Statistical analysis was done using a two-way, repeated-measures analysis of variance, t-test, the chi-square test, and Spearman rank correlation. A P value < .05 was considered significant.

RESULTS: Sixty patients were enrolled; 30 patients were allocated to the ketorolac group while 30 patients were allocated to the corticosteroid group. Data were analyzed for 57 patients (28 in the ketorolac group and 29 in the corticosteroid group) as 3 patients were lost to follow-up (2 after receiving ketorolac and 1 after receiving corticosteroid). The mean VAS score decreased significantly from baseline at 2 weeks in both the groups, 6.8-4.7 and 6.4-3.2, respectively, and remained decreased for 3 months. However, the reduction in VAS score was significantly more with corticosteroid than ketorolac at all the time points ($p < 0.05$). No correlation was seen between VAS and any demographic parameter in the two groups. WOMAC score, SF-36, and KOOS score were significantly increased from baseline at 3 months with both the treatments, but the improvements were higher with corticosteroid than ketorolac for all three functional scores ($p < 0.05$). No complications were seen with the injections in any patient in the two groups.

DISCUSSION AND CONCLUSION: Corticosteroid injection provided better pain relief than ketorolac injection in knee osteoarthritis. Also, the functional scores improved better with corticosteroid injection than ketorolac. Thus, ketorolac injection appears inferior to corticosteroid injection in providing pain relief and functional improvement for patients with mild-moderate knee osteoarthritis, although both are safe and effective treatment options. Further follow-up is required to confirm whether this trend in pain relief and functional improvement is maintained. Also, a search for another intra-articular drug needs to be done for knee osteoarthritis which is at least as efficacious as a corticosteroid, for avoiding any potential adverse effects of corticosteroids in the long term.

CONSORT Flow Diagram

