Effect of corticosteroids on pain and function in knee osteoarthritis patients

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Clinical Inquiries question

Does the type of corticosteroid have an effect on pain and functional status of the knee in osteoarthritis (OA) patients receiving intra-articular injections?

Evidence-based answer

In patients with knee OA, the type of injected steroid does not appear to alter pain and functional response, based on 3 head-to-head trials comparing intra-articular injection of different corticosteroid formulations for relief of knee pain and improvement of functional status (strength of recommendation A: based on small randomized controlled trials with consistent results).

Evidence summary

A 2015 randomized, double-blind, 24-week study in Brazil enrolled 100 patients with symptomatic knee OA of Kellgren-Lawrence grade II or III.[1] Patients received intra-articular injections in 1 knee. Fifty patients received 40 mg of triamcinolone and the other 50 received 40 mg of methylprednisolone. Pain was measured using a 100-point visual analog scale (VAS) at 0, 4, 12, and 24 weeks. For the triamcinolone group, VAS scores improved at 4 weeks and were sustained until 24 weeks (raw VAS scores: baseline 82.7, 4 weeks 46.4, 12 weeks 51.6, and 24 weeks 54.1; P=.272 for weeks 4 to 24). Similarly, for the methylprednisolone group, VAS scores improved at 4 weeks and were sustained until week 24 (raw VAS scores: baseline 78.5, 4 weeks 48.1, 12 weeks 51.6, 24 weeks 50.2; P=.272 for weeks 4 to 24). The overall treatment profiles of triamcinolone and methylprednisolone were not shown to be significantly different at 4 weeks (P=.352) or at 24 weeks (P=.523). Improvement in functional status was similar for both groups, as measured by the Lequesne index, which determines knee OA severity based on pain, maximum distance walked, and activities of daily living.

A 2004 double-blind randomized comparative trial in England enrolled 57 adult patients with knee OA of at least Kellgren-Lawrence grade II.[2] Patients were randomized to receive intra-articular injections in 1 knee: either 20 mg of triamcinolone or 40 mg of methylprednisolone. Pain, calculated using a 100-point VAS, and function, calculated using the Lequesne index, were measured at 0, 3, and 8 weeks. In the triamcinolone group, mean VAS score improved by 32.9 at 3 weeks (95% CI 23.4 to 42.4) compared to a mean at baseline of 66.0 (95% CI 56.8 to 75.1); mean VAS score further improved by 7.6 (95% CI -2.5 to 17.5) at 8 weeks. The methylprednisolone group did not improve as quickly, with a mean VAS score change of 13.7 at 3 weeks (95% CI 2.8 to 24.8) compared to a mean of 66.4 at baseline (95% CI 59.7 to 73.1); mean VAS score improved by 18.3 at 8 weeks (95% CI 7.2 to 29.4). At 8 weeks, there was no significant difference between triamcinolone and methylprednisolone (P=.17). There was no significant difference in functional status between the 2 groups as assessed by the Lequesne index at 8 weeks (P=.26).

A 2012 prospective randomized controlled study in Turkey enrolled 120 adult patients with moderate to severe knee OA of at least Kellgren-Lawrence grade II, and a pain score of 5 or more on a 10-point VAS.[3] Patients were randomized to receive knee injections in 1 knee: 40 mg of methylprednisolone, 40 mg of triamcinolone, 3 mg of betamethasone, or 0.09% saline (placebo). Pain and function were measured at 1, 3, 6, and 12 weeks. In the triamcinolone group, pain scores improved from a pre-injection mean VAS score of 7.6 to 5.7 at 12 weeks. Pain scores in the methylprednisolone group improved from a mean of 7.7 at baseline to 5.0 at 12 weeks. In the betamethasone group, the mean improved from 7.5 at baseline to 5.6 at 12 weeks. The placebo group showed no improvement in mean pain scores from 7.6 at baseline to 7.4 at 12 weeks. At 12 weeks, the VAS scores of the 3 corticosteroid groups were all better than placebo but did not differ significantly from each other (methylprednisolone and betamethasone, P=.36; methylprednisolone and triamcinolone, P=.27; triamcinolone and betamethasone, P=.99). At 12 weeks, the 3 steroids had statistically similar efficacy (P>.05) on function as assessed by the Lequesne index. The placebo group showed no improvement in function (14.9 at baseline compared to 14.5 at 12 weeks).

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Competing interests
None declared

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