Intra-articular steroid injections for painful knees: systematic review with meta-analysis

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CRD summary
This review concluded that intra-articular corticosteroids for osteoarthritis of the knee result in statistically and clinically significant improvements in pain one week after injection, but these were unlikely to continue beyond three to four weeks. Though little evidence was available and the observed improvements were small in absolute terms, these conclusions appear appropriate.

Authors' objectives
To establish whether intra-articular steroid injections relieve the pain of osteoarthritis of the knee.

Searching
MEDLINE, EMBASE and The Cochrane Library databases were searched without language restrictions to December 2002; search terms were reported. Further relevant studies were identified through the "related article" feature of PubMed, Google searches and manual checking of references and clinical guidelines.

Study selection
Randomised controlled trials (RCTs) and systematic reviews that evaluated intra-articular steroid injection against placebo for osteoarthritis of the knee were eligible. Older studies evaluating short-acting hydrocortisone acetate formulations were excluded.

Studies included in the review evaluated triamcinolone hexacetonide, methylprednisolone or cortivazol in patients with moderate-to-severe osteoarthritis in a secondary care setting. None used a local anaesthetic in addition to steroid treatment.

Assessment of study quality
Study design characteristics (blinding, randomisation, intention-to-treat analysis, crossover design) were extracted. The authors did not report using a formal quality assessment checklist or how many reviewers assessed study quality.

Data extraction
Key study characteristics and outcome data were extracted; failure to achieve target reduction in pain (as defined by study authors) was extracted as a dichotomous outcome, and where available mean and standard deviation values were extracted for pain measured by continuous visual analogue scale. Absolute risk reduction and number-needed-to-treat values were also presented for dichotomous outcomes.

The authors did not state how many reviewers performed the extraction.

Methods of synthesis
Pooled odds ratios with 95% confidence intervals were calculated for failure to achieve target reduction in pain. Weighted mean differences with 95% confidence intervals were calculated for visual analogue scale scores. Outcomes were subgrouped by length of follow-up (one week, three to four weeks, six to eight weeks). Statistical heterogeneity was assessed using the \( \chi^2 \) statistic.

Results of the review
Five placebo controlled RCTs (312 patients) were included in the review. Four were considered ‘double-blind’, two used a crossover design and all used intention-to-treat analysis.

Failure to achieve target reduction in pain: Steroid treatment was statistically significantly superior to placebo at one week (OR 0.24, 95% CI 0.13 to 0.46; four RCTs) and three to four weeks after injection (OR 0.24, 95% CI 0.12 to 0.47; two RCTs), but not at six to eight weeks after injection (OR 0.93, 95% CI 0.45 to 1.94; two RCTs).

Visual analogue scale pain score: Steroid treatment was statistically significantly superior to placebo at one week after...
injection (WMD -20.62, 95% CI -29.09 to -12.14; two RCTs) but not at three to four weeks (WMD -7.44, 95% CI
-15.14 to 0.26; two RCTs) or six to eight weeks (WMD -5.38, 95% CI -14.09 to 3.36; two RCTs). There was no
evidence of statistical heterogeneity for any of the analyses.

None of the five RCTs reported adverse consequences of intra-articular injections.

**Authors’ conclusions**

Intra-articular corticosteroids for osteoarthritis of the knee result in statistically and clinically significant improvements in pain one week after injection. This effect could last for three to four weeks but was unlikely to continue beyond that.

**CRD commentary**

The authors of this review made clear efforts to obtain all relevant randomised trials at the time of searching, though it should be noted that the most recent trial was published in 1999. Little information was available on the quality of included studies, or any efforts to minimise errors or bias in the selection, extraction and assessment of these studies.

A very small amount of available primary research data was available for the review. This raised concerns about a lack of statistical power to detect small effects or less common adverse events. The definitions and reporting of target reduction in pain also varied between the studies. However, the data on pain outcomes appears to be consistent across studies, and the authors’ interpretation of these findings appears appropriate.

**Implications of the review for practice and research**

**Practice:** The authors stated that osteoarthritis patients who have gastrointestinal side effects from NSAIDs might be good candidates for steroid injection, but warned that primary care physicians should consider whether they are comfortable delivering this treatment and whether their patients’ disease was similar to that of the trial participants.

The authors did not state any implications for research.

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