The efficacy and duration of intra-articular corticosteroid injection for knee osteoarthritis: a systematic review of level I studies
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CRD summary
The review concluded that intra-articular corticosteroid injections were significantly and clinically efficacious in reducing pain caused by knee osteoarthritis. The review was generally of poor quality and the authors' conclusions are not likely to be reliable.

Authors' objectives
To determine the efficacy and duration of different intra-articular corticosteroid injections in reducing pain caused by knee osteoarthritis.

Searching
MEDLINE (to June 2006), Web of Science and The Cochrane Library were searched for studies in English; search terms were reported. Reference lists of included studies were searched.

Study selection
Randomised controlled trials (RCTs) of intra-articular corticosteroid injections versus placebo in patients with osteoarthritis of the knee were eligible.

Most of the included trials evaluated triamcinolone; cortivazol, betamethazone and methylprednisolone were also studied. Most trials used normal saline solution as placebo. All included patients in the placebo-controlled studies had a radiographic diagnosis of knee osteoarthritis, graded using a variety of scales. Patients were predominantly women. Mean ages ranged from 60 to 70.6 years. Where reported, the duration of prior symptoms ranged from 2.5 to 7.5 years. Pain was recorded using either zero to 10 or zero to 100 visual analogue scales (VAS).

The authors did not state how many reviewers selected studies.

Assessment of study quality
Study quality was evaluated using criteria of randomisation, percentage of follow-up, level of blinding, use of crossover design, type of treatment and placebo preparations used and method used to confirm injection placement into the joint space.

The authors did not state how many reviewers performed the quality assessment.

Data extraction
Mean baseline and follow-up pain scores with standard deviations were extracted and converted to a zero to 100 scale when necessary. P values were extracted or calculated when not provided.

The authors did not state how many reviewers extracted data.

Methods of synthesis
A narrative synthesis was presented, grouped by intervention.

Results of the review
Six placebo-controlled RCTs were included (343 participants, sample size 12 to 84). Two studies were double-blind and two were single blind; details were unclear for the other two studies. Most trials confirmed needle placement within the joint by fluid aspiration. Percentage of follow-up ranged from 78% to 100%, but was not reported in two studies. The
authors stated that some studies used inadequate randomisation methods. Four RCTs that compared different types of corticosteroid were also included (total sample size unknown, range was 32 to 57 participants). Three of these trials were double-blind. One study confirmed needle placement within the joint by fluid aspiration.

**Corticosteroids versus placebo:** Follow-up ranged from two to 24 weeks. Four RCTs reported statistically significant differences in pain reduction after one week that favoured corticosteroid treatment (the mean reduction was 22 points on a zero to 100 scale). No significant pain differences between groups were seen at three or four weeks (four studies) and six to eight weeks (four studies). At week four, one study reported a significant difference from baseline in the corticosteroid group, but not in the placebo group. One study reported no significant pain differences between groups at 12 and 24 weeks.

**Comparisons of different corticosteroids:** Two of three studies that compared triamcinolone with methylprednisolone reported no statistically significant differences between groups; the third study found triamcinolone to be significantly more effective at reducing pain at week three (p<0.01). One study found triamcinolone to be significantly more effective than betamethasone at week one.

**Authors’ conclusions**
Intra-articular corticosteroid injections were significantly and clinically efficacious at reducing knee osteoarthritis pain for at least one week. From the limited studies available, triamcinolone appeared to be more efficacious than either betamethasone or methylprednisolone.

**CRD commentary**
Although the review addressed a clear question, the inclusion criteria related only to placebo-controlled trials; therefore, the authors included studies that did not satisfy the inclusion criteria and the methods used to identify these studies were unclear. Placebo-controlled studies were identified by searching electronic databases and checking references. Only studies in English were included and it was unclear whether unpublished studies were sought, so relevant trials may have been missed and the review may have been subject to publication and language biases. The authors did not report that they used methods (such as independent duplicate study selection and data extraction) to minimise the risk of reviewer error and bias during the review process. Details of the methods and results of the basic study quality assessment used were too incomplete to allow a full assessment of the reliability of the included studies. It appeared that some studies had methodological flaws and all had small sample sizes, so the possibility of chance results could not be ruled out.

A narrative synthesis was performed. The importance of individual studies appeared to be weighted equally; the authors did not comment on whether use of meta-analysis may have been appropriate. Tabulated details were provided, but only for the placebo-controlled studies. No definition of what might constitute a clinically important difference was given.

This review was poor in both its methodology and reporting. The authors' conclusions are not likely to be reliable.

**Implications of the review for practice and research**
**Practice:** The authors stated that corticosteroids may be incorporated into clinical practice for the short-term relief of knee osteoarthritis symptoms. They added that before using corticosteroids for chronic symptoms in knee osteoarthritis, physicians should be aware that the benefit is short-term and other treatments should be considered for longer-term pain reduction.

**Research:** Further studies were needed to compare different corticosteroids; they would benefit from standard validated outcome measures and standardised doses and follow-up time points.

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