Intra-articular and soft tissue injections, a systematic review of relative efficacy of various corticosteroids

Garg N, Perry L, Deodhar A

CRD summary
This review concluded that there was insufficient evidence on the comparative efficacy of different corticosteroid injections. A few trials favoured triamcinolone hexacetonide over the other corticosteroids. These conclusions reflect the evidence presented and appear to be reliable.

Authors' objectives
To determine the comparative efficacy of corticosteroid injections for intra-articular or periarticular soft tissue injections.

Searching
MEDLINE, Cochrane Database of Systematic Reviews, DARE, and Cochrane Central Register of Controlled Trials (CENTRAL) were searched in October or November 2013, for articles in English. Search terms and a search strategy were reported. Citation tracking and manual searches of bibliographies of relevant publications were conducted.

Study selection
Double-blind randomised controlled trials (RCTs) comparing corticosteroid injections, administered to peripheral joints or periarticular soft tissues, were eligible for inclusion. Trials had to include adults or children diagnosed with inflammatory arthritis, osteoarthritis, or a periarticular regional pain syndrome. Trials of spinal injections were excluded.

The included trials were published between 1979 and 2009. The most commonly evaluated corticosteroids were methylprednisolone acetate, triamcinolone, and betamethasone. Most injections were administered to the knees or shoulders. Patient characteristics and outcome measures varied across the trials.

Two reviewers independently selected trials for inclusion. Any discrepancies were resolved by consensus.

Assessment of study quality
Two reviewers independently assessed trial quality by assigning yes or no ratings for: specific inclusion and exclusion criteria; valid patient randomisation; blinding of patients; blinding of injectors; blinding of assessors; and power analysis. The thresholds used to define the quality of the trials were not reported.

Data extraction
The outcomes were extracted independently by two reviewers. None of the outcomes were specified before study selection and data extraction.

Methods of synthesis
The data were synthesised in a narrative.

Results of the review
Seven RCTs were included, with 306 patients (range 23 to 85). All seven RCTs were rated as high quality. One did not report blinding of assessors, and one did not report a power analysis. Two trials did not report blinding of the injector. Follow-up ranged from two weeks to 24 months.

Compared with methylprednisolone or prednisolone-t-butyl acetate, for rheumatoid arthritis of the knee, triamcinolone hexacetonide demonstrated statistically significantly faster pain relief at day seven (one RCT; 30 patients). A similar result was shown when triamcinolone hexacetonide for knee osteoarthritis was compared with methylprednisolone at week three (one RCT; 57 patients). Another trial (24 patients) demonstrated significantly faster pain relief with methylprednisolone for rotator cuff tendonitis, compared with triamcinolone acetonide, at two weeks. All three trials
demonstrated similar long-term efficacy of the corticosteroids for pain relief.

In trials of patients with knee arthritis, triamcinolone hexacetonide was found to have significantly better efficacy for pain relief than triamcinolone acetonide at 24 months (one RCT; 43 patients), and betamethasone at day 42 (one RCT; 23 patients). Occasional injection site pain, skin atrophy, and rise in blood glucose were the only adverse effects reported. Further results were reported.

**Authors' conclusions**
There was insufficient evidence on the comparative efficacy of different corticosteroid injections; a few trials favoured triamcinolone hexacetonide over other corticosteroids.

**CRD commentary**
The review question and inclusion criteria were clear. Various relevant databases were searched, but the English-language restriction means that some trials may have been missed. All the review processes were duplicated, reducing the risk of reviewer error and bias. The quality assessment criteria were relevant for RCTs, but some important issues were not considered, such as completeness of outcome data and comparability of groups at the start. Thus, there was potential for bias to have compromised the quality of the data. The differences between the trials meant that a narrative synthesis was appropriate.

The authors' conclusions reflect the evidence presented and appear to be reliable.

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

**Practice:** The authors did not state any implications for clinical practice.

**Research:** The authors stated that trials were needed to investigate the comparative efficacy of the different corticosteroid injections for articular and periarticular pain. These trials should have specific outcome measures to facilitate evidence-based practice. Further systematic reviews were recommended to assess the adverse effects of different corticosteroid injections in specific populations, such as pregnant patients, patients with diabetes, and immune-compromised patients.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.