Epidural corticosteroid injections in the management of sciatica: a systematic review and meta-analysis

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CRD summary
The authors concluded that epidural corticosteroid injections had small, possibly not clinically significant, only short-term effects on leg pain and disability, compared with placebo, in patients with sciatica. Not all the findings were included in the review and it was unclear what effect this might have had on the results. The reliability of the conclusions remains unclear.

Authors' objectives
To investigate the efficacy of epidural corticosteroid injections, compared with placebo, for sciatica.

Searching
PsycINFO, MEDLINE, EMBASE, Cochrane Central Register of Controlled Trials (CENTRAL), CINAHL and IPA were searched, for publications in English, from their inception to April 2012. Search terms were reported. The reference lists of eligible trials and relevant systematic reviews were manually searched.

Study selection
Eligible for inclusion were randomised controlled trials comparing the efficacy of epidural corticosteroid injections (caudal, interlaminar, or transforaminal) versus placebo in patients with sciatica or a synonym for sciatica, such as disc herniation. Trials had to report one of the following outcomes: overall pain intensity, leg pain intensity, back pain intensity, and disability status. Trials using a short-acting local anaesthetic were eligible if the anaesthetic was administered to all patients. Trials of patients with foraminal stenosis or lateral recess stenosis were eligible. Trials of patients who had received surgery or whose symptoms were due to spinal canal stenosis were excluded.

Included trials were published between 1970 and 2012 and, where reported, were conducted in hospitals, general or private practices, or military medical centres. Where reported, the mean age for the patient groups ranged from 37.3 to 52.8 years. Patients were classified by their symptoms being acute (less than six weeks), subacute (six to 12 weeks), chronic (12 weeks or more), or mixed. Epidural corticosteroids included methylprednisolone, prednisolone, triamcinolone, and betamethasone. Some trials provided additional interventions, such as analgesics, physiotherapy, or educational materials. Pain intensity was measured on visual analogue scales (zero to 100) or numeric rating scales (zero to 10). Disability was measured using the Oswestry Disability Index or Roland-Morris Questionnaire.

The authors did not state how many reviewers screened studies for inclusion.

Assessment of study quality
Two reviewers independently assessed the risk of bias in trials using the Physiotherapy Evidence Database (PEDro) scale, resulting in a score out of 10. Disagreements were resolved by a third reviewer. A modified version of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach was used to summarise the overall quality of the evidence.

Data extraction
Two reviewers independently extracted mean differences and 95% confidence intervals, or means (final scores or change scores) and standard deviations. These data were extracted for follow-up at immediate term (two weeks or less after randomisation), short term (between two weeks and three months), intermediate term (between three months and 12 months), and long term (over 12 months).

Scores for pain intensity and disability were converted to scales from zero (no pain or disability) to 100 (worst possible pain or disability). Where data were missing, trial authors were contacted or data were estimated using the methods recommended by the Cochrane handbook.
Methods of synthesis
Where trials were considered to be clinically similar, meta-analyses were performed to calculate weighted mean differences and 95% confidence intervals, using a random-effects model. Trials that reported only the percentage of patients who improved were not included in the meta-analysis. Overall pain and leg pain were pooled as one outcome. Statistical heterogeneity was assessed using $I^2$.

Subgroup analyses were undertaken to explore the influences of intention-to-treat analysis, therapist blinding, and allocation concealment on the treatment effects for short-term leg pain. They were also undertaken to explore the influence of epidural injection approaches, type of placebo, and definition of sciatica on the efficacy of epidural corticosteroid injections for leg pain.

Publication bias was explored using funnel plots and the Egger test.

Results of the review
Twenty-three RCTs, with 2,334 participants (range 23 to 325) were included in the review. The mean PEDro score was 7.2 (range four to 10). Fifteen trials did not have adequate allocation concealment; 16 were not therapist blinded; and eight used intention-to-treat analyses. According to the GRADE classification, the evidence from trials reporting short- and long-term follow-up outcomes was rated as high quality.

For leg pain, epidural corticosteroids showed a statistically significant improvement, compared with placebo, in the short-term (WMD -6.2, 95% CI -9.4 to -3.0; 14 RCTs; $I^2=10\%$), but not the long-term (seven RCTs; $I^2=15\%$). For back pain, there were no statistically significant differences between epidural corticosteroids and placebo at short-term follow-up (six RCTs; $I^2=0$) and at long-term follow-up (three RCTs; $I^2=0$). For disability, epidural corticosteroids statistically significantly relieved disability, compared with placebo, in the short term (WMD - 3.1, 95% CI -5.0 to -1.2; 10 RCTs; $I^2=0$), but not in the long term (six RCTs; $I^2=22\%$).

Results for immediate and intermediate follow-up were not reported, but were available from the authors on request. Subgroup analyses for leg pain in the short term revealed no differences between groups in the treatment effects. There was no evidence of publication bias in the funnel plots and the Egger test.

Authors' conclusions
The available evidence showed that epidural corticosteroid injections provided statistically significant short-term improvement in pain and disability, compared with placebo, for patients with sciatica, but there were no long-term effects and the effect size was small and might not have been clinically significant.

CRD commentary
The review addressed a clear question and was supported by appropriate inclusion criteria. A number of sources were searched, but there were restrictions on language and no attempts were made to locate unpublished data, which means that relevant studies might have been missed. The authors stated that no evidence of publication bias was found, but the funnel plot suggested that some data were missing. Quality assessment and data extraction were performed in duplicate, but it was unclear whether this was true for study selection, which means that reviewer error and bias cannot be ruled out.

Appropriate methods were used to assess trial quality and to some extent to investigate heterogeneity. Sufficient trial details were reported and appropriate methods were used to pool the data, but trials that reported percentage improvements only were not synthesised and the meta-analyses appear to have included only 15 of the eligible trials. The immediate and intermediate follow-up findings were not presented in the review and cannot be commented upon.

The effects of the additional trial data on the overall findings are unknown and the reliability of the conclusions remains unclear.

Implications of the review for practice and research
Practice: The authors stated that until the evidence changed, patients with acute sciatica should receive conservative care, following evidence-based guidelines, before any invasive treatment was considered. Patients with persistent and disabling sciatica should consider epidural corticosteroids and surgery.
Research: The authors stated that further research was needed on understanding the mechanisms of sciatica, to develop better treatments.

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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.