Systematic review of therapeutic lumbar transforaminal epidural steroid injections

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CRD summary
This review concluded that lumbar transforaminal epidural steroid injections have significant effect in relieving chronic pain of lumbar disc herniation and radiculitis (spinal nerve root inflammation). Given the potential for language and publication bias, uncertainty of review methods and the small number of included trials with small sample sizes, the authors’ conclusions may be overstated.

Authors' objectives
To evaluate the effect of transforaminal lumbar epidural steroid injections in managing lumbar (low back) and sciatica (leg) pain.

Searching
English language trials were identified through a search of PubMed, EMBASE and the Cochrane Library databases from 1966 to November 2008. Search terms were reported. Reference lists of identified articles were also searched.

Study selection
Randomised controlled trials (RCTs), observational studies and reports of lumbar transforaminal epidural injections, with or without steroids, in patients with chronic low back and lower extremity pain for at least three months, were eligible for inclusion. Studies were required to report follow-up data of at least six months. Reports without appropriate diagnosis, non-systematic reviews, book chapters and case reports were excluded.

The primary outcome measure was pain relief in the short-term (up to six months) and the long-term (more than six months). Secondary outcomes included functional assessment, psychological improvement, return to work and change in opioid intake.

Interventions included local anaesthetic, methylprednisolone, bupivacaine, betamethasone, xylocaine and triamcinolone acetonide; controls included normal saline, trigger-point injections and bupivacaine.

The authors did not state how the papers were selected for the review or how many reviewers performed the selection.

Assessment of study quality
Quality of RCTs was assessed using Cochrane Collaboration review criteria using weighted scores out of 100. Quality of observational studies was assessed using the Agency for Healthcare Research and Quality (AHRQ) criteria with consensus-based weighted scoring also out of 100. Studies scoring at least 50 were eligible for analysis.

Data extraction
A study was judged to be positive if the transforaminal epidural injection therapy was clinically relevant and effective, either with placebo control or active control; statistical significance was at the 5% level; clinical relevance was determined by five questions recommended by the Cochrane Back Review Group.

A study was judged negative if no difference between study treatments, or no improvements in baseline outcomes, were observed.

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

Methods of synthesis
Data from included RCTs were combined in a narrative synthesis, with additional data presented in a table. Observational studies were to be included in evidence synthesis if there were less than four randomised trials meeting the inclusion criteria.
Results of the review
Four RCTs (n=502 patients, range 48 to 239) were included in the review. One trial scored 86 out of a possible 100 points for quality; the remaining three trials scored between 63 and 73 points.

All four trials reported positive short-term relief (6 months or less); two trials reported positive long-term relief (more than 6 months); one trial did not report on long-term relief.

One RCT, comparing pre-ganglionic to ganglionic injections of triamcinolone and bupivacaine, found that the pre-ganglionic group showed greater short-term improvement, but long-term follow-up showed no significant differences between groups.

One RCT compared methylprednisolone and bupivacaine to saline injections. It found that the steroid group showed significantly greater improvement at two weeks, but significantly greater improvement in the saline group at three and six months.

One RCT compared nerve root injections of betamethasone and bupivacaine or bupivacaine alone. It found that significantly fewer patients receiving the combination treatments underwent surgery at 28 months. Long-term results showed positive effects both with and without steroids.

One RCT compared betamethasone and lidocaine to a muscle trigger point injection of saline. Patients improved in both groups, but there was significantly greater improvement in the steroid group.

Cost information
One RCT reported that treatment with lumbar transforaminal epidural injection using methyl-prednisolone and bupivacaine appeared to prevent operations for contained herniations, costing $12,666 per patient (p<0.01).

Authors' conclusions
Lumbar transforaminal epidural injections had significant effect in relieving chronic pain of lumbar disc herniation and radiculitis.

CRD commentary
The review addressed a clear question with well-defined inclusion criteria. Relevant databases were searched, but it did not appear that attempts were made to retrieve unpublished studies, so some data may have been missed. It was unclear whether steps were taken to minimise the risk of error and bias in the processes of study selection, data extraction and validity assessment.

Suitable measures were used to assess the methodological quality of included trials and the results were used to inform the results. The decision to use a narrative analysis was appropriate, given the heterogeneity in terms of patients, interventions and outcomes; both head-to-head and placebo trials were included. Only four trials were included in the review and sample sizes were small in three of these (less than 80 patients).

Given the potential for language and publication bias, uncertainty of review methods and the small number of included trials with small sample sizes, the authors' conclusions may be overstated.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that future research should include a clear case definition, with consistent inclusion and exclusion criteria, clear outcome measures, appropriate design and reporting of randomised controlled trials.

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