Therapeutic facet joint interventions in chronic spinal pain: a systematic review of effectiveness and complications

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CRD summary
This review assessed the effectiveness of facet joint injections, medial branch blocks and facet joint radiofrequency neurotomy for chronic spinal pain. The authors concluded that there was negative to strong evidence for the effectiveness of facet joint interventions. Inadequate reporting of the review methods and differences between the studies make it difficult to assess the reliability of the authors' conclusions.

Authors' objectives
To evaluate the effectiveness of three types of facet joint intervention (facet joint injections, medial branch blocks and facet joint neurotomy) for the treatment of spinal pain.

Searching
MEDLINE and EMBASE were searched from inception to November 2004. Searches of the Cochrane Library, systematic reviews, narrative reviews, cross-references to reviews and published trials, and peer-reviewed abstracts of scientific meeting for the previous 2 years, were also conducted. Only studies reported in the English language were eligible. The search strategy was described.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) and observational studies were eligible for inclusion if they met pre-specified quality criteria. Reports of complications were also included (no further details were reported).

Specific interventions included in the review
Studies of facet joint injections, medial branch blocks and facet joint radiofrequency neurotomy were eligible for inclusion. The included studies used interventions that targeted different regions (cervical, thoracic and lumbar). Injections included steroids and/or local anaesthetic, or saline; dosages varied between the studies.

Participants included in the review
For facet joint injections and medial branch blocks, studies of patients with chronic spinal pain for at least 3 months were eligible for inclusion. For studies of radiofrequency neurotomy, the patients had to have had spinal pain for at least 6 months. The studies had to diagnose pain originating in the facet joint using controlled diagnostic facet joint or nerve blocks. However, 'some' studies that used single blocks were also considered. Two studies focused on patients with whiplash injuries, one focused on sports-related injuries and one on post-surgical pain.

Outcomes assessed in the review
Studies were included if they evaluated the outcomes statistically at 3 months. The primary outcome was pain relief. The secondary outcomes were functional or psychological improvement, return to work and complications. The review assessed short-term (less than 6 weeks for studies of intra-articular and medial branch blocks and less than 3 months for studies of radiofrequency) and long-term (at least 6 weeks for studies of intra-articular and medial branch blocks and at least 3 months for studies of radiofrequency) outcomes.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The studies were assessed using criteria described by the Agency for Healthcare Research and Quality (AHRQ; see Other Publications of Related Interest no.1). In addition, included RCTs were assessed using criteria described by the Cochrane Review Group for musculoskeletal disorders: assessment of randomisation; allocation concealment; whether treatment groups are comparable at baseline; blinding; whether relevant cointerventions are controlled for; if compliance was unlikely to cause bias; assessment of at least one primary outcome measure; withdrawals and drop-outs; and use of intention-to-treat analysis. Studies were only included in the review if they met the specified criteria (adequate descriptions of the patients and intervention and the measurement of clinically relevant outcomes) and scored positive on 5 of 10 specified AHRQ criteria for RCTs or 5 of 8 AHRQ criteria for observational studies.

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

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

RCTs were considered to be positive if the facet joint intervention was more effective than the control treatment, while observational studies were considered to be positive if the treatment was reported as effective using defined criteria. All other studies were considered negative. If the reviewers considered there were inconsistencies in the conclusions, disagreements were resolved by discussion and consensus.

Methods of synthesis
How were the studies combined?
The studies were grouped by type of intervention and combined in a narrative. The level of evidence for each intervention was graded as conclusive, strong, moderate, limited or indeterminate, using a hierarchy of evidence based on study design and adapted from specified guidelines (see Other Publications of Related Interest no.2).

How were differences between studies investigated?
The results were reported separately according to study design (RCTs and observational studies), timing of the outcome assessment (short term and long term) and site of intervention (lumbar, thoracic or cervical).

Results of the review
A total of 5 RCTs (n=270), 8 prospective observational studies (n=390) and 10 retrospective observational studies (n=779) were included in the review.

Two RCTs (n=142) evaluated intra-articular facet joint injections; 3 prospective observational studies (n=189) and 2 retrospective observational studies (n=133) evaluated lumbar facet joint injections.

One RCT (n=73) and one prospective observational study (n=100) evaluated medial branch blocks.

Two RCTs (n=55), and 4 prospective (n=101) and 8 retrospective observational studies (n=646) evaluated medial branch neurotomy.

Two hundred and forty-six articles reported complications (no details were reported).

Facet joint injections.
The evidence for lumbar intra-articular facet joint injection was moderate in the short term (the only RCT reported negative findings but the reviewers re-classified the findings as positive; 4 of 5 observational studies reported positive findings) and limited in the long term (the only RCT reported negative findings; 2 of 5 observational studies reported positive findings).

There was negative evidence for cervical intra-articular facet joint injections (the only RCT reported negative findings).
Medial branch blocks.

The evidence for cervical medial branch blocks using local anaesthetics plus steroids was moderate (the only RCT reported positive short- and long-term findings).

The evidence for lumbar medial branch blocks using local anaesthetics plus steroids was moderate (the only observational study reported positive short- and long-term findings).

Facet joint neurotomy.

The evidence for radiofrequency neurotomy of medial branch nerves was moderate to strong: positive short- and long-term findings were reported for studies of cervical branch neurotomy (the single RCT plus 2 of 4 observational studies), lumbar spine neurotomy (the single RCT), lumbar branch neurotomy (3 of 6 observational studies) and thoracic cervical branch neurotomy (1 of 2 studies).

Complications.

The most common complications were related to the placement of needles and drugs. Potential complications were listed. The authors of the review stated that quantitative data were not generally reported.

Authors' conclusions

There was negative to strong evidence for the effectiveness of facet joint interventions for treating patients with chronic spinal pain.

CRD commentary

The review addressed a clear objective with inclusion criteria defined in terms of the participants, intervention, outcomes and study design, although the inclusion criteria for study design were broad. It was not clear why the minimum duration of chronic pain for eligible patients differed for the various interventions, or why the timing of the outcome assessment also differed between interventions. Several relevant sources were searched but, by limiting the included studies to those reported in English, the authors might have missed some relevant studies. The methods used to select the studies, assess validity and extract the data were not described, so it is not known whether any efforts were made to reduce reviewer errors and bias. Only studies meeting minimum quality criteria were included, and validity was assessed using an established checklist. However, only the composite validity scores were presented, thus making it difficult for the reader to judge the study validity for themselves. The studies were classified as positive or negative based on the original authors' conclusions (albeit with the validity of the conclusions examined by the reviewers), but there were no details of how the authors dealt with multiple outcomes.

The studies were grouped by study design and site of intervention and combined in a narrative, which appeared appropriate given the diversity of the studies. The results were reported in relation to study design, but not in relation to any other indicators of quality, which made it difficult to assess the strength of the evidence. Potential reasons for differing results amongst the studies were not discussed. Inadequate reporting of the review methods and differences between the studies make it difficult to confirm the reliability of the authors' conclusions.

Implications of the review for practice and research

The authors did not state any implications for practice or further research.

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Record Status
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.