Systematic review of diagnostic utility and therapeutic effectiveness of cervical facet joint interventions


CRD summary
The authors reported that diagnostic cervical facet joint nerve blocks were safe, valid and reliable for management of chronic facet joint neck pain; they recommended the use of therapeutic medial branch nerve blocks and radiofrequency neurotomy, but found no evidence for intra-articular injections. Limitations of the evidence and the review process mean that the authors’ conclusions should be viewed cautiously.

Authors’ objectives
To evaluate the accuracy of diagnostic facet joint nerve blocks and the effectiveness of cervical facet joint interventions in managing chronic neck pain of facet joint origin.

Searching
MEDLINE, EMBASE, the Cochrane Library, and Clinical Trials Registry were searched from 1966 to December 2008 for studies published in English; search terms were reported. Google Scholar was also searched. Bibliographies of narrative and systematic reviews were screened for additional studies.

Study selection
For diagnostic interventions, studies in patients with chronic cervical facet pain of greater than three months duration were eligible for inclusion. Eligible studies were required to use controlled diagnostic blocks, either placebo or comparative, under fluoroscopic guidance. The reference standard for diagnosis of cervical facet joint pain was at least 80% pain relief for the duration of local anaesthetic effect and ability to perform previously painful movements.

For therapeutic interventions, randomised controlled trials (RCTs) of three types of joint facet interventions (intra-articular facet joint interventions, medial branch blocks, and medial branch neurotomy) were eligible for inclusion. If there were less than four RCTs of an intervention, observation studies were eligible for inclusion. All therapeutic studies had to provide appropriate management with outcome evaluations of at least six months and report appropriate statistical analysis. The primary outcome measure was pain relief. Secondary outcome measures were functional status improvement, psychological status improvement, return to work, opioid intake and complications. Studies were also required to have met diagnostic criteria.

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

Assessment of study quality
For studies of diagnostic interventions, two reviewers assessed the methodological quality of included studies using Agency for Healthcare Research and Quality (AHRQ) criteria for diagnostic studies; any disagreements were resolved by the third physician. The methodological criteria included: appropriate study population; adequate description of test; adequate and reproducible reference standard; evaluation of test without knowledge of disease status; independent blind interpretation of test and reference standard; and avoidance of verification bias. An overall quality score, on a scale of 0 to 100, was derived for each study.

For studies of therapeutic interventions, two reviewers assessed the methodological quality of included studies using modified Cochrane criteria for randomized trials and AHRQ quality criteria for observational studies; any disagreements were resolved by the third physician. Methodological criteria included: adequate description of participants; interventions and treatment settings; reporting of all clinically relevant outcomes; clinical relevance of effect size; and assessment of benefits in comparison to harms. An overall quality score, on a scale of 0 to 100, was derived for each study.

Only studies with a methodological quality score between 50 and 100 were considered to meet inclusion criteria.
Data extraction
For diagnostic studies, data were extracted on prevalence of cervical facet joint pain and false positive rates associated with diagnostic blocks, with 95% confidence intervals (CIs).

The results of therapeutic intervention studies were extracted as reported; proportion of patients experiencing pain relief at a given time point, or mean and standard deviation change in pain score.

The authors did not state how data were extracted for the review.

Methods of synthesis
Studies were summarised in a narrative synthesis, stratified by diagnostic and therapeutic interventions and by specific intervention type.

Results of the review
Diagnostic interventions
Nine studies were included in the review (n=1,290 patients). Methodological quality scores ranged from 50 to 75. The prevalence of cervical facet joint pain ranged from 36% (95% CI 27 to 45) to 67% (95% CI 58 to 75), based on nine data sets from eight studies. False positive rates ranged from 27% (95% CI 15 to 38) to 63% (95% CI 48 to 78), based on six data sets from five studies.

Therapeutic interventions
Intra-articular facet joint blocks: No randomized controlled trial or observational study of intra-articular facet joint blocks met the inclusion criteria.

Medial branch blocks: One RCT, 120 patients; one observational study, 100 patients: The RCT used an active control equivalence or non-inferiority design; The effectiveness of medial branch blocks was compared with bupivacaine alone (group I), and the effectiveness of cervical medial branch blocks was compared with bupivacaine and steroids (group II). Significant pain relief (50% or more) and functional status improvement (40% or more) of Neck Pain Disability Index (NDI) were observed at three months, six months, and 12 months in over 83% of the patients; durations of pain relief were similar across the two groups. The observational study (by the same authors) reported significant differences in scores and pain relief (50% or more) at three months, six months, and 12 months compared with baseline; improvements were also reported for functional status, employment status, and psychological functioning.

Radiofrequency neurotomy: One RCT, 24 patients; four observational studies, 28 to 49 patients: The RCT compared percutaneous radiofrequency neurotomy with a sham treatment in patients with cervical spine pain from car accidents. The study found that radiofrequency neurotomy could provide pain relief; the median time for return to at least 50% of the pre-operative pain level was 263 days in the active treatment group and eight days in the sham group. All four observational studies reported positive results; three studies reported significant pain relief in 64 to 88% of patients and median durations of pain relief from 31 to 35 weeks; the remaining study reported a reduction in visual analogue scale pain score of 4.6 (±1.8) from baseline to one year.

Authors' conclusions
Diagnostic cervical facet joint nerve blocks were safe, valid, and reliable. No evidence was available for the therapeutic effectiveness cervical intra-articular facet joint injections. Evidence supported the use of therapeutic medial branch block and radiofrequency neurotomy interventions.

CRD commentary
The review addressed two separate research questions on the diagnostic and therapeutic applications of cervical facet joint interventions in managing chronic neck pain of facet joint origin. Inclusion criteria and quality assessment criteria were specified separately for each question. A number of sources were searched for relevant studies, but the restriction to English language raised the possibility of incomplete retrieval and potential language bias. Descriptions of study selection and data extraction were limited and it was unclear whether measures were taken to minimise error and/or bias.
Study quality assessment and evidence grading processes were described in detail and included measures to minimise error and/or bias. Reporting of the data from individual included studies was limited. The use of a narrative synthesis was appropriate, but might have been improved by greater use of tables of study characteristics and results; the tables presented were highly focused upon quality assessment.

Overall, the authors rating of levels of evidence and grades of recommendation appear optimistic for the quantity and quality of the data presented; their conclusions should be viewed cautiously.

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

**Practice:** The authors stated that the recommendation was 'strong' for both medial branch nerve blocks and radiofrequency neurotomy for the treatment of chronic cervical facet joint pain.

**Research:** The authors did not make recommendations for future research.

**Funding**
Not stated.

**Bibliographic details**

**PubMedID**
19305483

**Original Paper URL**

**Additional Data URL**

**Other publications of related interest**

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Anesthesia, Local; Cervical Vertebrae; Chronic Disease; Evidence-Based Medicine; Humans; Injections, Intra-Articular; Neck Pain /drug therapy /physiopathology; Nerve Block /methods; Pain Measurement /methods; Severity of Illness Index; Treatment Outcome; Zygapophyseal Joint /drug effects

**AccessionNumber**
12009107239

**Date bibliographic record published**
02/12/2009

**Date abstract record published**
16/03/2011

**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.