Percutaneous radio-frequency neurotomy treatment of chronic pain following whiplash injury: reviewing evidence and needs

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Authors' objectives
To evaluate the effectiveness and safety of percutaneous radio-frequency neurotomy (PRFN) treatment of chronic cervical spine pain arising from zygapophysial joint injury following motor vehicle and other accidents, both in itself and in comparison with alternative invasive and noninvasive therapies.

Searching
Current Contents, EMBASE, HealthSTAR and MEDLINE were searched (search dates not reported). A search protocol to identify primary analyses was combined with terms specific to chronic cervical zygapophysial pain and percutaneous radio-frequency neurotomy. A fugitive information search was also conducted to identify published and unpublished scientific literature not appearing in peer-reviewed journals or not indexed in commercially available databases. This included searching an in-house database, Internet peer-reviewed sites, directories, commercial databases and web library catalogues, Internet search engines, contacting relevant organisations, and reference scanning. Full details of the search strategies were reported in the publication. No language restrictions were reported.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials and controlled trials were eligible for inclusion. Single case studies and laboratory and simulation studies were excluded.

Specific interventions included in the review
Comparisons of PRFN with no treatment, placebo or other interventions were eligible for inclusion. The included study compared PRFN to a sham machine.

Participants included in the review
Studies of patients of any age or ethno-cultural group, treated for persistent cervical pain following whiplash associated with motor vehicle or other accidents, were eligible for inclusion, whether or not the diagnosis was proven with local anaesthetic injection into nerves supplying the painful joint(s). No exclusion was made due to co-morbidity. The patients in the included study all had whiplash attributable to motor vehicle accident and had failure of conventional therapy.

Outcomes assessed in the review
To be included in the review, the studies had to report at least one measure relating to a health outcome, defined as 'a change in a patient's current health status that can be attributed to antecedent health care'. The studies had to have a minimum observational period of 4 weeks. The outcomes reported in the included study included pain, activities of daily living and psychological distress.

How were decisions on the relevance of primary studies made?
The search results were reviewed independently by two reviewers, and the inclusion criteria were applied to each article. Any disagreements were resolved by discussion. All articles that appeared to meet the criteria were requested in full-text form. Full articles were assessed for inclusion independently by two reviewers.

Assessment of study quality
Studies that met the inclusion criteria were appraised using the standard BCOHTA Intervention Study Appraisal Form, which was presented in an appendix to the report. The quality features assessed included: study design; randomisation; blinding; prognostic stratification; description of the sample population; description of the inclusion criteria; drop-outs; baseline comparability of the groups; statistical analysis; appropriate outcome measures; and sample size calculation.
The studies were assessed for quality independently by at least two reviewers.

**Data extraction**
The data were extracted independently by at least two reviewers. Data were extracted on the methods, interventions, outcomes and results.

**Methods of synthesis**
How were the studies combined?
As only one study was included this was discussed narratively.

How were differences between studies investigated?
Differences could not be investigated because only one study was included.

**Results of the review**
One randomised controlled study (n=24) was included.

Post-operation.

Three of the 12 in the treatment group return to accustomed pain immediately post-operation, compared with 6 of the 12 in the control group. Seven of the 12 in the treatment group were pain free at 27 weeks, compared with one of the 12 in control group. The median time to a 50% return of pre-operative pain was 263 days in treatment group, and 8 days in the control group. Pain ultimately returned in all cases.

**Cost information**
PRFN will benefit those patients suffering the most costly whiplash-associated disorders, i.e. those lasting longer than 6 months, which account for a disproportionately large percentage of the costs.

**Authors' conclusions**
PRFN treatment has been shown to be effective versus placebo at relieving chronic pain proven to arise in the zygapophysial joint following whiplash injury, in one double-blind randomised controlled trial of 24 carefully selected patients. PRFN provides relief of pain for short to moderately long periods. There was no efficacy or effectiveness evidence from controlled trials comparing PRFN with any alternative therapy to treat chronic neck pain following whiplash injury. The efficacy of PRFN in one highly specialised setting was promising, but there was an overall lack of evidence of effectiveness. While treatment benefits have been demonstrated in a clinical setting of excellence, realistic concerns must be raised about replication outside of this setting.

**CRD commentary**
This was a good review of the area. A thorough literature search was conducted, which included attempts to locate unpublished material; it is unlikely that important studies have been missed. A quality assessment was performed and the methodology of the review process was described. Only one study was included in the review. This was discussed in detail and the results were appropriately presented, although there was no indication of the significance of the results.

The authors' conclusions are supported by the results presented.

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

Research: The authors state that further research is required in this area, particularly comparing PRFN with alternative
therapies; this should be carried out in appropriate settings. Possible adverse effects of PRFN also need to be investigated.

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