Role of adhesiolysis in the management of chronic spinal pain: a systematic review of effectiveness and complications

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CRD summary
This review assessed percutaneous adhesiolysis and spinal endoscopic adhesiolysis for chronic low back pain and lower extremity pain. The authors concluded that there is moderate to strong evidence to support percutaneous adhesiolysis with hypertonic sodium chloride and spinal endoscopic adhesiolysis with epidural steroids. Limitations in the reporting of the results make it difficult to adequately assess the robustness of the conclusions.

Authors' objectives
To assess the effects and safety of percutaneous adhesiolysis and spinal endoscopic adhesiolysis in treating chronic low back pain and lower extremity pain.

The review also sought to compare percutaneous adhesiolysis with epidural steroid injection; to assess the effects of adding hypertonic sodium chloride solution or hyaluronidase; and to compare percutaneous adhesiolysis with spinal endoscopic adhesiolysis.

Searching
EMBASE, MEDLINE (1966 to November 2004), BioMed Central and the Cochrane Database of Systematic Reviews were searched. In addition, reference lists of known primary studies and systematic and narrative reviews, published trials, relevant and published peer-reviewed indexed and non-indexed journals, scientific newsletters and abstracts from scientific meetings over the previous 2 years were screened. The search terms were reported. Only reports in the English language were included.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) and observational studies were eligible for inclusion.

Specific interventions included in the review
Studies of percutaneous adhesiolysis and spinal endoscopic adhesiolysis were included. The studies had to describe the interventions in sufficient detail to enable replication. Studies of percutaneous adhesiolysis used the following: adhesiolysis, hypertonic saline neurolysis, steroid and local anaesthetic; adhesiolysis, normal saline and steroid; adhesiolysis followed by either hypertonic saline plus hyaluronidase, hypertonic saline alone, isotonic saline alone, or isotonic saline plus hyaluronidase; or adhesiolysis, hypertonic saline neurolysis and epidural steroid (on one or more occasions). The control treatments included catheterisation without adhesiolysis, and physical therapy exercise programme plus medication. All studies of spinal endoscopic adhesiolysis involved the administration of local anaesthetic or steroid. One study compared spinal endoscopic adhesiolysis with no adhesiolysis, endoscopic injection of local anaesthetic plus steroid. Further details of the interventions were provided.

Participants included in the review
Studies of patients with chronic lumbar and sacral spinal pain for at least 6 months, with or without lower extremity pain, were eligible for inclusion. The patients should have previously tried either one or multiple non-interventional therapies (exercises, physical therapy plus activity improvement, chiropractic management and drug therapy with non-steroidal anti-inflammatory agents) or undergone surgical intervention. For percutaneous adhesiolysis, prior treatments included fluoroscopically directed epidural steroids; for spinal endoscopic adhesiolysis, prior treatments included fluoroscopically directed epidural steroids and percutaneous adhesiolysis. The studies had to describe patients in sufficient detail to determine whether they were representative of the relevant clinical population.

Outcomes assessed in the review
Studies that assessed pain intensity, overall improvement or functional status were included in the review. The primary review outcome was the percentage of patients with short-term (less than 3 months) and long-term (3 months or more) pain relief. The secondary review outcomes were functional or psychological improvement, return to work and complications.

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). Studies were only included if they scored 50% or more on quality criteria (the review authors do not specify which criteria). RCTs that scored less than 50% could be included as observational studies. RCTs were assessed according to the study question, study population, randomisation, blinding, interventions, outcomes, statistical analysis, results and discussion. Observational studies were assessed according to the study question, search strategy, inclusion criteria, interventions, outcomes, data extraction, study quality and validity, data synthesis and analysis, results and discussion. In addition, included RCTs were also assessed using criteria described by the Cochrane Review Group for musculoskeletal disorders: assessment of randomisation; allocation concealment; whether treatment groups were comparable at baseline; blinding; whether relevant cointerventions were controlled for; if compliance is unlikely to cause bias; assessment of at least one primary outcome measure; withdrawals and drop-outs; and use of intention-to-treat analysis.

Three reviewers independently assessed validity.

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

Studies were considered to be positive if the authors concluded that adhesiolysis was either more effective than the control (RCTs) or it was effective (observational studies). All other studies were considered negative. If the reviewers considered there was conflict with the conclusion, the conclusions were changed.

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative. Studies of percutaneous adhesiolysis and spinal endoscopic adhesiolysis were discussed separately. 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 (see Other Publications of Related Interest no.2).

How were differences between studies investigated?
Some differences between the studies were discussed in the text, while others were evident from the tables.

Results of the review
Four RCTs and seven observational studies were included in the review. There were 3 RCTs (n=179) and 2 observational studies (n=189) of percutaneous adhesiolysis and 1 RCT (n=83) and 5 observational studies (n=257) of spinal endoscopic adhesiolysis.

Percutaneous adhesiolysis.
The 3 RCTs scored 10, 7 and 6 out of 10 for quality using AHRQ criteria, and 10, 7 and 5 out of 10 using Cochrane validity criteria. The 2 observational studies scored 4 out of 8 on AHRQ criteria.

All 3 RCTs found significant improvement with percutaneous adhesiolysis over that of catheterisation without adhesiolysis, physical therapy programme plus medication, or patients acting as their own control. Both observational
studies reported short-term improvements; one also reported long-term improvements.

Two RCTs reported that percutaneous adhesiolysis was superior to epidural steroid injection in both the short and long term. Two observational studies reported improvements with adhesiolysis in patients who had all failed with epidural steroid injections.

There was no significant difference between treatment groups with the addition of sodium chloride (2 RCTs) or hyaluronidase (1 RCT).

One RCT reported no adverse effects. Adverse effects reported in the other studies included: subarachnoid block (1 of 25 participants) in 1 study; suspicion of infection (1 case) in 1 study; subarachnoid block (2%), serious infection (1 case) and suspicion of infection (2%) in 1 study; subarachnoid puncture (4 of 178), infection (1 of 178) and suspicion of infection (8 of 178) in 1 study. None of the studies reported any cases of arachnoiditis, paralysis, weakness, bladder disturbances or other serious complications. Some studies reported minor adverse effects such as rash and itching.

Spinal endoscopic adhesiolysis.

The RCT scored 10 out of 10 for quality using AHRQ criteria and 10 out of 10 using Cochrane validity criteria. The observational studies scored from 4 to 6 out of 8 on AHRQ criteria.

The RCT reported significant improvements in pain relief and return to work in patients who were treated with spinal endoscopic adhesiolysis. Three prospective observational studies also showed improvement. Both retrospective studies reported positive short- and long-term results.

The reported adverse effects included: subarachnoid puncture and block (1 of 50) in 1 study; post dural-puncture headache (3 of 21) in 1 study; no deterioration of motor or sensory deficits in 1 study; subarachnoid puncture (7 of 77) and suspicion of infection (8 of 77) in 1 study; subarachnoid puncture (8 of 112), infection (2 of 112) and suspected infection (6 of 112) in 1 study. Some studies reported minor adverse effects such as rash, itching, increased discomfort and neck pain.

Authors' conclusions
There was moderate to strong evidence for the effectiveness of percutaneous adhesiolysis with hypertonic sodium chloride and for spinal endoscopic adhesiolysis with epidural steroids for the management of chronic, refractory low back pain and lower extremity pain.

CRD commentary
The review addressed a clear objective. The inclusion criteria were defined in terms of participants, intervention, outcomes and study design, but were complex and not always clear. Several relevant sources were searched but, by limiting the included studies to those in English, the authors might have missed some relevant studies. Methods were used to minimise reviewer errors and bias in the assessment of validity, but it was unclear whether similar steps were taken in the study selection and data extraction processes. Validity was assessed and reported, and studies were only included if they met minimum quality criteria. However, some of the criteria used to assess the validity of observational studies seemed inappropriate for the assessment of primary studies.

The narrative synthesis of studies seemed appropriate given the small number of diverse studies. The outcomes to which the results referred were unclear, and levels of statistical significance were not reported. Uncertainties about the quality of the included studies and limitations in the reporting of the results make it difficult to adequately assess the robustness of the authors' conclusions.

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

Research: The authors stated that more work is needed to determine the characteristics of patients who may have the
best outcomes with percutaneous or spinal endoscopic adhesiolysis. They further stated that the studies included in the review should be replicated, and that a registry of patients undergoing these techniques would be useful in evaluating long-term outcomes.

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