Extracorporeal shock wave therapy for calcific and noncalcific tendonitis of the rotator cuff: a systematic review

Harniman E, Carette S, Kennedy C, Beaton D

CRD summary
This review assessed extracorporeal shock wave therapy (ESWT) for calcific and non-calcific rotator cuff (RC) tendonitis. The authors concluded that there is moderate evidence for treating calcific RC tendonitis with high-energy ESWT focused on the calcific deposit and moderate evidence for the ineffectiveness of low-energy ESWT for non-calcific RC tendonitis. The authors’ conclusions are likely to be sound.

Authors' objectives
To assess the effectiveness of extracorporeal shock wave therapy (ESWT) for calcific and non-calcific tendonitis of the rotator cuff (RC).

Searching
MEDLINE (1966 to April 2003) EMBASE (1980 to May 2003), CINAHL (1982 to May 2003) and EBM were searched for reports published in English or French. The paper stated that the details of the search strategy were available from the authors. The reference lists in selected studies were also checked.

Study selection
Study designs of evaluations included in the review
Case series, cohorts, case-control studies, controlled clinical trials and randomised controlled trials (RCT) with more than 20 participants were eligible for inclusion.

Specific interventions included in the review
Studies of ESWT were eligible for inclusion. Patients with calcific RC tendonitis generally received from 1 to 8 sessions of ESWT at weekly intervals under regional, local or no anaesthetic, using some type of guidance. Patients with non-calcific RC tendonitis received 3 sessions of ESWT at weekly or monthly intervals (where stated); only one study used local anaesthetic and only one study used some type of guidance.

Participants included in the review
Studies of patients with calcific or non-calcific RC tendonitis were eligible for inclusion. Where reported, the mean age of the participants ranged from 45 to 53 years, and in the majority of studies more than half of the participants were female. Most of the participants had chronic disease (lasting 3 months or more) and most had not responded to conservative treatment.

Outcomes assessed in the review
The most common outcome used in the included studies was the Constant Score. This assessed pain, activities of daily living, shoulder motion and power. Studies also assessed subjective improvement and disability. The reviewers decided that patients should be followed up for at least 3 months in order to describe a clinically relevant result.

How were decisions on the relevance of primary studies made?
Two reviewers independently selected studies and resolved any disagreements on inclusion through discussion.

Assessment of study quality
Studies were assessed using three different sets of criteria. All of the studies were assessed using MacDermid’s criteria (highest possible score 48 points) (see Other Publications of Related Interest no.1). Studies with a control group were assessed using criteria described by van Tulder (highest possible score 11 points, with scores of 6 or more indicating a...
high-quality study). RCTs were assessed using the Jadad criteria (highest possible score 5 points, with scores of 3 or more indicating a high-quality study). In addition, the studies were graded using a hierarchy of study design based on the Oxford Centre for Evidence-Based Medicine Levels of Evidence (see Other Publications of Related Interest no.2). Two reviewers independently assessed validity and resolved any disagreements through discussion, or by recourse to a third reviewer.

Data extraction
Two reviewers independently extracted the data using a standardised form. The reviewers were not blinded to the author, institution or journal. The data extracted included details of the participants, interventions and outcomes.

Methods of synthesis
How were the studies combined?
Studies considered high-quality using either van Tulder or Jadad criteria were grouped by type of RC tendonitis and combined in a narrative. Details of the other studies were tabulated. The level of evidence was graded using a hierarchy of evidence based on the Oxford Centre for Evidence-Based Medicine Levels of Evidence (level A, strong; level B, moderate; level C, limited; level D, conflicting).

How were differences between studies investigated?
Differences between the studies were discussed with respect to the intervention and quality criteria.

Results of the review
Sixteen studies were included: 5 RCTs (n=334) and 11 non-randomised studies (n=835).

The studies displayed a variety of methodological limitations: a lack of sample size calculations; possible selection and treatment provider biases; a lack of randomisation and blinding; inadequate description of the sample and treatment groups; poor outcome; poor reporting of the results; poor handling of missing data; and a lack of intention-to-treat analysis.

Three RCTs were considered high-quality using the van Tulder criteria. Two RCTs were considered high-quality using the Jadad criteria.

Patients with calcific RC tendonitis showed some change with control treatment.

Calcific RCT tendonitis. There was moderate evidence for high-energy ESWT focused on the calcific deposit. Only one RCT (n=50) was rated high-quality using both the van Tulder and Jadad criteria. It found that ESWT focused on the calcific deposit significantly improved outcomes (Constant Score, pain and subjective improvement) at 12 weeks and 1 year in comparison with ESWT focused on the origin of the supraspinatus tendon.

Non-calcific RC tendonitis.

There was moderate evidence that low-energy ESWT was no more effective than sham ESWT in the short term. Two RCTs (40 and 70 patients, respectively) rated high quality using either the van Tulder or the Jadad criteria found no statistically significant difference in outcomes (Constant Score, pain and subjective improvement in 1 RCT; pain and disability in the other RCT) at 4 weeks to 4 months between ESWT and sham ESWT.

Authors’ conclusions
There was moderate evidence for treating patients with calcific RC tendonitis with high-energy ESWT focused on the calcific deposit and there was moderate evidence of the lack of effectiveness of low-energy ESWT for patients with non-calcific RC tendonitis.

CRD commentary
The review addressed a clear question in terms of the participants, intervention and study design. Inclusion criteria were not explicitly stated for the outcomes. Several relevant sources were searched, and attempts were made to limit language bias by including reports in two languages. No attempts were made to locate unpublished reports. Two reviewers independently selected studies, assessed validity and extracted the data, thus reducing the potential for bias and errors. Validity was assessed using specified established criteria that were appropriate for each included study design. The narrative synthesis, which focused on only high-quality studies, was appropriate. The authors’ conclusions are supported by the evidence presented and are likely to be sound.

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

Research: The authors stated that there is a need for adequately powered high-quality RCTs with better randomisation, blinding and outcome measures.

Bibliographic details

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Other publications of related interest

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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.