Effectiveness of rehabilitation for patients with subacromial impingement syndrome: a systematic review
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CRD summary
This review examined rehabilitation interventions for subacromial impingement syndrome. The authors concluded appropriately that the evidence was limited but suggested that exercise, joint mobilisation and laser therapy were effective in the reduction of pain and improvement of function. Ultrasound did not appear to be beneficial and the evidence for acupuncture was equivocal.

Authors' objectives
To examine the evidence for rehabilitation interventions for subacromial impingement syndrome (SAIS).

Searching
The following databases were searched from 1966 to October 2003 using a variety of keywords, as documented in the report: MEDLINE, CINAHL, and either the Cochrane Database of Systematic Reviews or the Cochrane CENTRAL Register (one specified in the abstract; the other specified in the 'Methods' section). The references of all retrieved studies and all relevant conference proceedings were also examined. The searches were limited to trials published in English.

Study selection
Study designs of evaluations included in the review
To be eligible, studies needed to be randomised controlled trials (RCTs) or controlled trials.

Specific interventions included in the review
To be eligible, trials needed to compare a physical nonsurgical, non-pharmacological treatment with another intervention, no intervention, or a placebo treatment. The included studies used exercise, joint mobilisation, laser, ultrasound and acupuncture. Treatments were given in combination or in isolation.

Participants included in the review
To be eligible, trials needed to include adults with signs and symptoms consistent with SAIS, as documented in the report.

Outcomes assessed in the review
To be eligible, trials needed to include clinically relevant and adequately described measures of pain, functional loss or disability. All trials included a primary outcome measure of pain, while the majority included a direct relevant measure of functional loss or disability.

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
A quality checklist was developed according to published guidelines for evidence based medicine. It consisted of 23 items, each of which could be assigned zero, one or two points. Quality scores were summed and the average of the two reviewers was taken to be the final score. Neither the paper nor the reference given in the paper explain how this scoring system provided a maximum possible score of 69 points for validity. Two independent reviewers assessed the trials. Agreement between the reviewers was assessed for any discrepancies of greater than one point on any single quality checklist item, and consensus was reached.
Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Methods of synthesis
How were the studies combined?
The trials were combined in a narrative, grouped by intervention type.

How were differences between studies investigated?
Differences between the trials were documented in the report.

Results of the review
Twelve RCTs (n=599) were included in the review.

The quality of the included trials was moderate (mean quality score 37.6, range: 33.5 to 41; maximum possible score 69).

Exercise.
Six of 6 trials demonstrated a benefit from therapeutic exercise programmes. Benefits in terms of shoulder function, pain and disability were observed when exercise was compared with placebo or no intervention. Benefits in comparison with surgery were unclear. The design of an optimal exercise programme, in terms of techniques, frequency, intensity and level of supervision, was unclear.

Joint mobilisation.
Two of 2 trials suggested that joint mobilisation combined with therapeutic exercise might lead to better outcomes. However, it was unclear which patients are most likely to respond to this combination and the exact techniques to be used were also unclear.

Laser therapy.
The current evidence from 3 trials, although conflicting, suggested that low-level laser therapy is more beneficial than placebo when applied as a single intervention. However, no additional benefits on the outcomes of pain and improvement of function were demonstrated when laser therapy was added to exercise.

Ultrasound.
Neither of the 2 trials investigating ultrasound demonstrated a beneficial effect in this patient group.

Acupuncture.
Evidence on acupuncture from 2 trials was limited and conflicting. One trial demonstrated no benefits of acupuncture over other treatments, whilst the other demonstrated short-term benefits only for pain, function and range of motion.

Authors' conclusions
The authors concluded that the evidence was limited, but suggested that exercise, joint mobilisation and laser therapy were effective in the reduction of pain and improvement of function in patients with SAIS. Ultrasound did not appear to be beneficial and the evidence for acupuncture was equivocal.

CRD commentary
The review question was clear with documented inclusion criteria for the participants, interventions, study design and
outcomes. Searching was based on a small range of databases, supplemented by reference checking. The restriction of trials to English language publications might have resulted in the omission of relevant trials and raises the possibility of language bias. Study validity was assessed and the results presented in the context of quality. Details of the study selection and data extraction processes were not provided in full, so it was not possible to assess the possibility of bias in these procedures. The authors' recommendations are in line with the evidence presented, although the included trials may be underpowered to detect a potential effect for laser therapy and ultrasound. Their recommendations for further research are appropriate given the limitations in the current evidence base.

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

Practice: The authors stated that the current evidence base supported the use of therapeutic exercise, particularly when combined with joint mobilisation techniques. A course of therapeutic exercise is recommended and should be used to reduce symptoms and restore function before surgery. Laser therapy might be best employed in those unable to exercise. Ultrasound is not recommended, while acupuncture alone is neither recommended nor discouraged.

Research: The authors stated that further trials are needed to investigate the rehabilitation interventions examined in this review. Such trials should assess well-defined interventions in the short and long term, and should use placebo or no intervention controls for treatments with no or limited evidence of effect. The authors highlighted the need for clinical guidelines to indicate those patients likely to respond to rehabilitation and to focus on the validity of the clinical diagnosis of SAIS.

**Bibliographic details**


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**Other publications of related interest**


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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.