The effectiveness of exercise in the physiotherapy management of subacromial impingement syndrome (Protocol for a systematic review)

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Record Status
This record provides details of a protocol for a systematic review currently being undertaken. It is due for publication in January 2011

Citation

Authors' objectives
Review question
To determine the effectiveness of exercise in the physiotherapy management of subacromial impingement syndrome.

Search strategy
An electronic literature search of eight relevant databases: Cochrane Central Register of Controlled Trials (to the current issue), AMED (1985 to present date), MEDLINE (1966 to present date), EMBASE (1980 to present date), CINAHL (1981 to present date), Proquest Health (1986 to the present date), PEDro (1929 to present date), and sportsdiscuss (1830 to present date) will be conducted.

Keywords to be used are:
Exercise, physiotherapy, physical therapy, rehabilitation, isometric, isotonic, isokinetic, closed chain, open chain, resistance, stabilisation, stretching, flexibility, AND shoulder impingement, subacromial, tendonitis, tendinopathy, tendinosis, rotator cuff, Glenohumeral.

A theses search for unpublished material will also be conducted via the 'Index to Theses' and openSIGLE databases. References lists of all retrieved work will be hand searched for further relevant material.

Types of study to be included
Randomised controlled trials, published in English, investigating any mode of exercise in the management of subacromial impingement syndrome will be included.

Participants
Trials involving the following participants will be extracted:
1. Male and female adult patients (18 years and over).
2. Participants with Stage I or Stage II SIS that has specifically been diagnosed using either MRI, USS, Plain radiography, or physical examination using recognised impingement tests such as Neer’s or Hawkins-Kennedy impingement tests and painful arc tests. Trials in which the participants have been diagnosed according to Dutch Shoulder Guidelines as being a shoulder compliant without restricted passive range of movement, but with a painful arc or pain at the end of movement will be included.
3. Participants with alternative diagnoses of rotator cuff pathology such as 'tendinopathy', or 'tendinosis' that has not progressed to include full rupture will be included.
4. Participants with stage III SIS i.e. full thickness rotator cuff tears will not be included.
5. Studies that focus on participants following surgical repair of the rotator cuff or rehabilitation of post-operative subacromial decompression patients will not be included.
6. Patients with shoulder pain due to other pathologies such as adhesive capsulitis, calcific tendonitis, posterior superior glenoid impingement and shoulder instability will not be included.

Interventions
Trials that involve any form of exercise versus placebo, other modalities and other forms of exercise will be considered. Types of exercise may include the following:
1. Exercises designed to restore normal range of motion i.e. passive, active assisted and active exercises, therapeutic stretching or flexibility exercises.
2. Exercises designed to strengthen the rotator cuff musculature i.e. isometric rotator cuff strengthening, isotonic rotator cuff strengthening using elastic resistance or weights and alternative forms of resistance and isokinetic rotator cuff strengthening.
3. Open and closed chain exercises designed to strengthen the periscapular musculature.

Trials investigating self-monitored, home or supervised exercises will be included.

**Primary and secondary outcomes**
Outcome measure selection will not be used to exclude any otherwise relevant trial. Trials using measures of pain, function, disability, quality of life, range of movement, strength, return to work and patients’ and health care providers’ perception of outcome will be included. Extracted data will include: participant characteristics (duration of symptoms and medication use where possible), type of exercise intervention and intervention parameters, and results of outcome measures. Any adverse events that are reported due to exercise will be noted.

**Strategy for data synthesis**
If the data from the extracted studies is sufficiently homogenous, a meta-analysis will be performed. Homogenous studies will be defined as those with comparable interventions, participants, outcome measures and duration of follow up. Appropriate statistical advice will be sought regarding the meta-analysis section. Pooling of sufficiently homogenous data will be carried out using Review Manager software.

The treatment effect size and variance of individual studies will be calculated. The type of outcome measures used within the trials and hence the nature of the data collected will be examined i.e. continuous or binary data. To allow comparison between trials, the data will firstly be converted into a standardised format. With continuous data, this will be expressed as the standardised mean difference (SMD) and weighted mean difference (WMD) with 95% confidence intervals between treatment groups. The selection of SMD or WMD will be dependent upon how the outcomes are reported. The Cohen’s d method of calculating the SMD in effect size will be used. For binary/dichotomous data the results of each trial will be converted into odds ratios (OR) and relative risks (RR) with 95% confidence intervals. An effect size of 0.8 or more will be regarded as a large effect size, between 0.5 and 0.8 a medium effect size and between 0.2 and 0.5 will be considered to be a small effect size.

To determine the summary effect, the weighted mean of the individual effects will be calculated. Testing for consistency/heterogeneity using the $I^2$ measure will be conducted to determine which model should be used to calculate the overall summary effect. If the studies used in the analysis are deemed to be estimating the same population effect, a fixed effects model will be used. If however, the true effect sizes vary between studies, such that they are deemed to be estimating a distribution of population effects rather than a single population effect, a random effects model will be used to determine the summary effect.

Individual treatment effect sizes with 95% confidence intervals and the pooled summary effect will then be displayed on a forest plot. A funnel plot will be used to assess for bias across included studies e.g. publication bias.

**Sensitivity analysis**
A sensitivity analysis involving only high quality studies will be carried out to investigate how sensitive the results of the meta-analysis are to the inclusion of studies of varying quality and size.

**Subgroup analysis**
If possible, a subgroup analysis will be conducted. Reviewed trials will be stratified according to type of exercise and location (i.e. supervised or home setting) to attempt to determine the effects of different modes of exercise.

**Measures of Clinical Relevance**
Regardless of whether the data is of sufficient homogeneity to allow further quantitative analysis, the clinical relevance of the included studies will be summarised using best-evidence synthesis guidelines from the Cochrane Collaboration Back Review Group.

Clinical relevance will also be assessed using criteria recommended by Furlan et al (2009).
Project page URL
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Indexing Status
Subject indexing assigned by CRD

MeSH
Adult; Exercise Therapys; Shoulder Impingement Syndrome /rehabilitation; Treatment Outcome

Language Published
English

Country of organisation
Ireland

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AccessionNumber
32010000598

Date abstract record published
12/05/2010