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Review

Lack of uniformity in diagnostic labeling of shoulder pain: Time for a different approach

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Abstract

Diagnostic labels for shoulder pain (e.g., frozen shoulder, impingement syndrome) are widely used in international research and clinical practice. However, about 10 years ago it was shown that the criteria to define those labels were not uniform. Since an ongoing lack of uniformity seriously hampers communication and does not serve patients, we decided to evaluate the uniformity in definitions. Therefore, we compared the selection criteria of different randomised controlled trials (RCTs). This comparison revealed some corresponding criteria, but no uniform definition could be derived for any of the diagnostic labels. Besides the lack of uniformity, the currently used labels have only a fair to moderate interobserver reproducibility and in systematic reviews none of the separate trials using a diagnostic label show a large benefit of treatment. This, altogether, seems sufficient reason to reconsider their use. Therefore, we strongly suggest to abolish the use of these labels and direct future research towards undivided populations with "general" shoulder pain. Possible subgroups with a better prognosis and/or treatment result, based on common characteristics that are easily and validly reproducible, can then be identified within these populations.

Keywords: Shoulder pain; Shoulder impingement syndrome; Rotator cuff; Diagnosis

1. Introduction

In the past many subgroups have been suggested in people with shoulder pain with enhancement of treatment success as one of the aims (e.g., frozen shoulder, rotator cuff tendinitis, impingement syndrome). About 10 years ago, however, it was shown that the specific criteria for each of those subgroups were not uniformly defined (Green et al., 1998).

In order to systematically evaluate the efficacy and effectiveness of therapeutic interventions for shoulder pain, it is necessary to compare the results of different studies. However, if the lack of unambiguous definitions still exists today, this, would seriously hamper inter-study comparison.

Diagnostic labels are still frequently used in intervention research on shoulder pain. Therefore, this review aims to assess the uniformity of criteria used in intervention research to define diagnostic labels for subgroups of patients with shoulder pain.

2. Methods

2.1. Selection criteria

Since one of the main goals of the diagnostic labels is to enhance treatment success, we focused on the main tool of intervention research: i.e., randomised controlled trials (RCTs). An RCT was included in the present review only when it concerned an intervention for shoulder pain with a specific diagnostic label. There were no restrictions on the kind of intervention or the population being studied, based on the assumption that

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sociodemographic factors do not affect the definitions of the different diagnostic labels. Reasons for exclusion were complaints due to an external identifiable cause (e.g., trauma, surgery) or a known underlying disorder (e.g., rheumatologic disorder, neurological disorder, fracture, luxation, malignancy). Search and selection were done by one of the authors (JMS).

2.2. Search strategy

Medline was searched with the medical subject headings "shoulder", "shoulder pain", "shoulder impingement syndrome", "rotator cuff" and "bursitis" in combination with a search strategy for RCTs and systematic reviews (Shojania and Bero, 2001; Robinson and Dickersin, 2002).

The Cochrane central register of controlled trials (CENTRAL) and the Cochrane database of systematic reviews were searched using the following terms: "shoulder", "frozen shoulder", "calcifying tendinitis", "rotator cuff" and "glenoid". The terms were restricted to "title, abstract and keywords".

We searched the literature for studies published from January 1990 through December 2006. Languages were restricted to English, French, German and Dutch. The only reason to search for systematic reviews was to screen their reference lists. A reference check was also performed in all the RCTs.

2.3. Evaluation of uniformity

The criteria for patient selection were extracted from each trial. The separate criteria of each trial were compared with those using an equivalent diagnostic label.

We aimed to identify either corresponding or contradictory diagnostic tests and features of the shoulder. Items were considered to correspond if they described the same test or feature of the shoulder (e.g., Neer's impingement sign, or restriction of movement). They were considered to be contradictory if the item was a reason for inclusion in one article and a reason for exclusion in another (e.g., a positive test).

3. Results

Our search strategy resulted in the following hits per database: Cochrane CENTRAL 1401 articles, Cochrane database of systematic reviews 40 articles, and Medline 2603 articles. Of all these articles, 66 met our criteria.

A total of 13 different diagnostic labels were found (Table 1), which we combined into five main groups based on the similarities of names and the way the names are used interchangeably.

Table 1
Diagnostic labels used in shoulder research and the number of RCTs using the same label

Label	Number of articles[a]
Adhesive capsulitis	18
Frozen shoulder	12
Painful stiff shoulder	3
Rotator cuff tear	4
Shoulder tendinitis	5
(Subacromial) bursitis	4
Rotator cuff tendinitis	5
Rotator cuff tendinosis	1
Calcific tendinitis	6
Calcifying tendinitis	7
Tendinitis calcarea	1
Supraspinatus tendinitis	2
(Subacromial) impingement syndrome	15

[a]The total number in this column exceeds the total number of included RCTs, because some articles use more than one label for the same population.

3.1. Adhesive capsulitis/frozen shoulder

This group contains "adhesive capsulitis", "frozen shoulder" and "painful stiff shoulder". A consistent description could not be derived from the 21 RCTs using these diagnostic labels (Jacobs et al., 1991; Rizk et al., 1991; White and Tuit, 1996; Gam et al., 1998; de Jong et al., 1998; Rovetta and Monteforte, 1998; van der Windt et al., 1998; Jones and Chattopadhyay, 1999; Dahan et al., 2000; Arslan and Celiker, 2001; Kivimaki and Pohjolainen, 2001; Sun et al., 2001; Karatas and Meray, 2002; Carette et al., 2003; Buchbinder et al., 2004a, b; Guler-Uysal and Kozanoglu, 2004; Pajareya et al,. 2004; Widiastuti-Samekto and Sianturi, 2004; Ryans et al., 2005; Vermeulen et al., 2006).

All these articles stated that a restricted movement of the shoulder should be present, but they were not consistent regarding the amount of restriction (number of degrees), the kind of restriction (active and/or passive), and the direction of the restriction (e.g., abduction, external rotation).

Nocturnal accentuation of shoulder pain was mentioned as an inclusion criterion in 7 RCTs (Rizk et al., 1991; White and Tuit, 1996; Gam et al., 1998; de Jong et al., 1998; Jones and Chattopadhyay, 1999; Sun et al., 2001; Karatas and Meray, 2002).

3.2. (Subacromial) impingement syndrome

Thirteen of the 15 RCTs using this diagnostic label describe one or more of the following tests as an inclusion criterion: Neer's impingement sign, Kennedy–Hawkins impingement sign, and Neer's impingement test (Hawkins and Kennedy, 1980; Neer, 1983; Brox et al., 1993; Lindh and Norlin, 1993; Blair et al., 1996; Rahme et al., 1998; Brox et al., 1999; Bang and Deyle,