

Consensus for physiotherapy for shoulder pain

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Abstract

Purpose Shoulder pain is a common disorder. Despite growing evidence of the importance of physiotherapy, in particular active exercise therapy, little data is available to guide treatment. The aim of this project was to contribute to the development of an internationally accepted assessment and treatment algorithm for patients with shoulder pain.

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Methods Nine physiotherapists with expertise in the treatment of shoulder dysfunction met in Sweden 2012 to begin the process of developing a treatment algorithm. A questionnaire was completed prior to the meeting to guide discussions. Virtual conferences were thereafter the platform to reach consensus.

Results Consensus was achieved on a clinical reasoning algorithm to guide the assessment and treatment for patients presenting with local shoulder pain, without significant passive range of motion deficits and no symptoms or signs of instability. The algorithm emphasises that physiotherapy treatment decisions should be based on physical assessment findings and not structural pathology, that active exercises should be the primary treatment approach, and that regular re-assessment is performed to ensure that all clinical features contributing to the presenting shoulder pain are addressed. Consensus was also achieved on a set of guiding principles for implementing exercise therapy for shoulder pain, namely, a limited number of exercises, performed with appropriate scapulo-humeral coordination and humeral head alignment, in a graduated manner without provoking the presenting shoulder pain.

Conclusion The assessment and treatment algorithm presented could contribute to a more formal, extensive process aimed at achieving international agreement on an algorithm to guide physiotherapy treatment for shoulder pain.

Keywords Shoulder pain · Physiotherapy · Exercise therapy · Treatment algorithm · Clinical reasoning

Introduction

Shoulder pain is the third most common musculoskeletal condition presenting to physicians or physiotherapists within primary healthcare. The prevalence of shoulder pain in the general population has been reported to vary between 7 and

30 % [1–3], it increases with age [2] and has been reported to be higher in women than in men [3].

Current classification systems for shoulder pain have been shown to be unreliable [4–7], resulting in a lack of diagnostic consistency in relation to shoulder pain. Subacromial pain syndrome is the most common diagnosis for patients presenting with shoulder pain [8, 9] and includes rotator cuff syndrome (including rotator cuff tears), tendonitis and bursitis [10]. This painful, disabling condition places a significant burden on healthcare resources [10].

Although surgery followed by postoperative physiotherapy (PT) is utilized in the treatment of shoulder pain, there is growing evidence that surgical intervention does not result in superior patient outcomes compared to PT alone. Physiotherapy has been shown to result in similarly positive short- and long-term clinical outcomes as subacromial decompression/acromioplasty [11–15] and acromioplasty plus rotator cuff repair [14] in patients with subacromial pain. In addition, evidence is growing that treating shoulder pain with PT greatly reduces the number of patients undergoing surgery for subacromial pain syndrome [16, 17] or rotator cuff tear [18, 19].

The main PT intervention for treating shoulder pain and dysfunction is active exercise therapy. Limited available data suggests that implementing a program of physiotherapist supervised exercises confers clinical benefit in the short and longer term when compared to no treatment [11, 12, 20] or placebo treatment [11, 12]. A number of reviews have concluded that there is moderate evidence that active exercises reduce pain and restore function in patients with subacromial pain syndrome [8, 10, 21].

Despite growing evidence of the importance of PT, in particular active exercise therapy, in the treatment of shoulder pain there is no consensus as to the most effective exercise strategy. Many exercises have been proposed and little data is available to guide the physiotherapist in selecting the most appropriate care pathway. The aim of this project was to contribute to the development of an internationally accepted algorithm to guide PT assessment and treatment for patients with shoulder pain and dysfunction.

Methods

In October 2012 seven physiotherapists were invited to attend a two-day face-to-face meeting in Sweden, by two of the authors (IHK & KG) to discuss PT treatment of shoulder pain. The physiotherapists were invited on the basis of their special expertise in the treatment of shoulder dysfunction and/or research into the treatment

of shoulder dysfunction published in peer-reviewed journals or presented at scientific meetings, as well as residing in Europe at the time of the meeting. The aims of the meeting were to:

- 1) Examine the clinical reasoning that underpins how experienced physiotherapists treat shoulder dysfunction
- 2) Develop a treatment algorithm to serve as a guide for less experienced physiotherapists and to contribute to the process of determining international standard best practice in the PT treatment of shoulder dysfunction.

The meeting was financed by funds raised from a conference organized prior to the meeting at which the majority of meeting participants contributed as speakers.

As a basis for discussions at the face-to-face meeting, the nine participating physiotherapists completed a questionnaire prior to the meeting. The questionnaire related to the following clinical scenario: a patient presenting with shoulder pain of insidious onset with no past history of shoulder dysfunction, interfering with everyday life activities and with evidence of partial or a small full thickness rotator cuff tear by MRI. Participants were asked to state their:

- i) Priorities/focus of initial PT assessment
- ii) Short/medium term aims of PT treatment
- iii) Principle/s guiding an exercise program including how to progress (increase the difficulty) of exercises
- iv) Frequency of patient attendance for PT treatment
- v) Criteria to assess PT treatment effectiveness
- vi) Duration of PT treatment

Responses to the questionnaire that demonstrated consistency between participants were summarized by IHK & KG prior to the face-to-face meeting and guided discussion at this meeting to clarify points of agreement and disagreement regarding the clinical reasoning underpinning the PT treatment of shoulder pain. Following two days of face-to-face discussion, including demonstration and explanation of the rationale for the use of various exercise strategies, each participant was asked to prepare an algorithm for the treatment of shoulder pain based on the results of the meeting for future discussion over the Internet. Multiple virtual meetings chaired by IHK were held in order to reach consensus on an assessment and treatment algorithm for a patient with shoulder pain. Based on the results of the discussions at each meeting documents were revised and distributed. Participants were required to review these revised documents and return comments/suggestions to IHK who collated and distributed responses in preparation for the next meeting.

Results

The following consistent responses were reported on the questionnaire distributed to participants prior to the face-to-face meeting:

- Priorities and focus during the initial assessment: to evaluate shoulder strength deficits and quality of active movements
- Short/medium term PT treatment aims should be achieved primarily by active exercises
- Guiding principles for an exercise program, including how to progress the exercises, i.e. increase difficulty: good quality shoulder movement; minimal pain increase during exercises; progress from basic (simple) to more functional (complex) shoulder movements
- Frequency of attendance and duration of PT treatment: average once per week for a period of three months

No consistency was revealed regarding criteria to assess PT treatment effectiveness.

Discussions at the face-to-face meeting focused on four main issues: the definition of “good quality shoulder movement”; the nature of the pain that was to be avoided or minimised during therapeutic exercise performance; criteria to assess PT treatment effectiveness; and specific exercises to use in the PT treatment of shoulder pain.

Participants agreed on the following description of what constitutes “good quality shoulder movement”: co-ordinated (smooth) scapulohumeral movement based on movement analysis research and side-to-side comparison, with correct humeral head positioning in the glenoid fossa and no abnormal compensatory trunk movement.

Participants also agreed that the pain to be avoided or minimized during therapeutic exercise for shoulder pain is pain located over the shoulder joint and/or upper arm which caused the patient to seek treatment. Other sensations that the patient might describe as uncomfortable, muscle soreness or fatigue were acceptable. Further discussions regarding how much pain should be tolerated during therapeutic shoulder exercise revealed two firmly held positions. Some participants argued that shoulder exercises should be chosen and performed so as not to reproduce the pain for which the patient had sought treatment. The rationale for this view included that pain: (a) may indicate that the exercise is too difficult, is not being performed correctly or is not the optimal exercise for the patient, (b) may be an indication of overload of stressed tissue, (c) may inhibit motor relearning, or (d) may reduce a patient’s motivation to adhere to the exercise therapy. Other participants argued that some localized pain (VAS $\leq 4/10$) during the performance of therapeutic shoulder exercises which was short lasting: (a) may be beneficial to promote tendon healing, (b) may guide how to load the tendon, (c) and may motivate

some patients to adhere to the exercise therapy. All participants did agree that it was important to empower the patient to adhere to an exercise program and to guide the patient to avoid activities or exercises that aggravate the shoulder pain.

Extensive face-to-face discussion did not result in participants being able to agree on a battery of tests to assess PT treatment progress and success or a recommended set of exercises to treat shoulder pain.

Following 18 months of virtual discussion, consensus was achieved on a physiotherapy assessment and treatment algorithm for a patient with shoulder pain. A flowchart illustrating this algorithm is presented as Fig. 1. The flowchart summarizes the clinical reasoning process underpinning the different possible pathways of PT assessment and intervention. The following notes were developed to accompany the flowchart in order to explain the principles and procedures to optimize the clinical outcome for a patient with shoulder pain.

Introduction to the PT assessment and treatment algorithm for a patient with shoulder pain

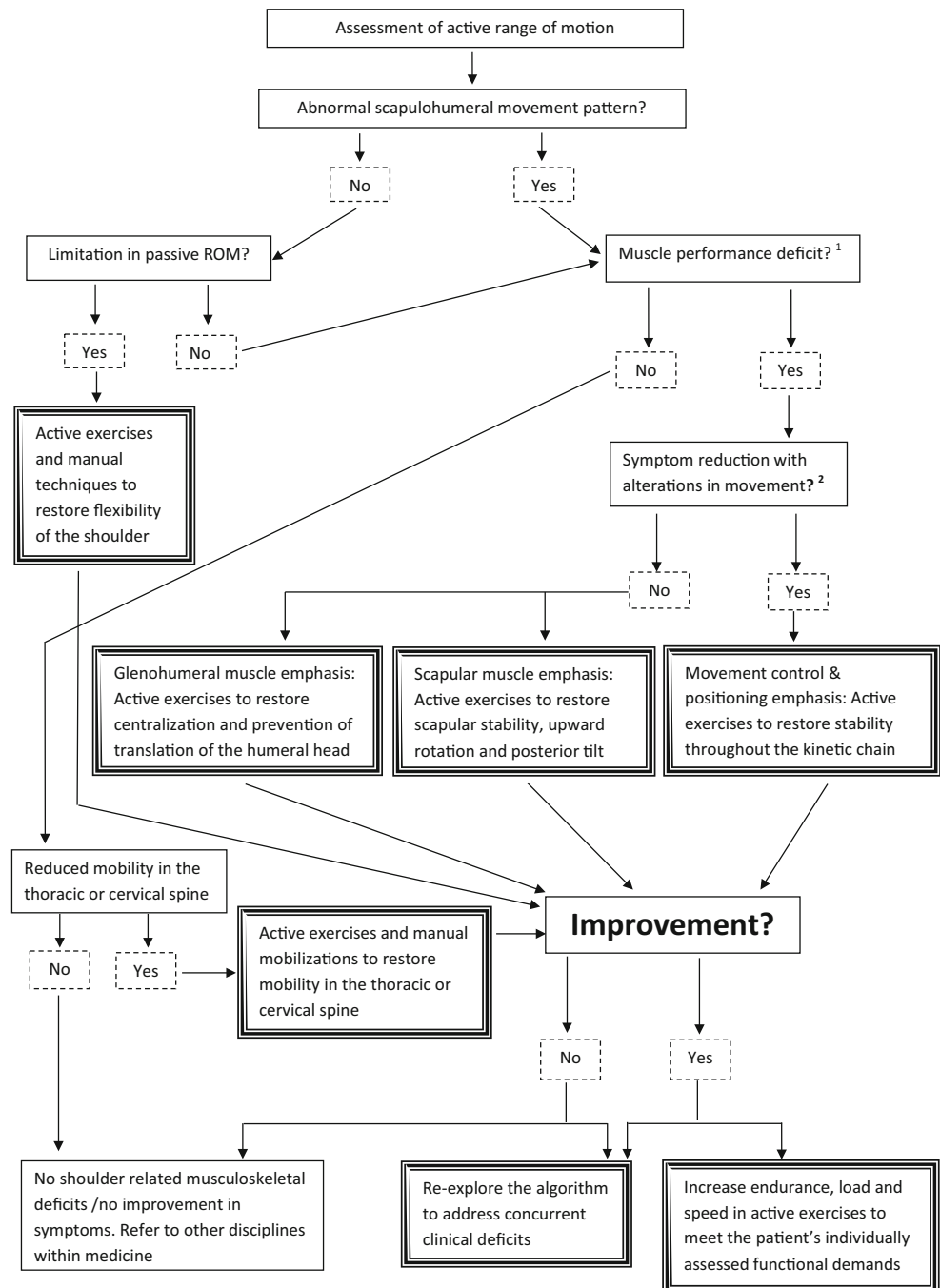
This algorithm is designed to guide PT assessment and treatment for a patient presenting with the following clinical scenario:

- A primary presenting symptom of shoulder pain during activity with minimal pain at rest
- No significant shoulder passive range of motion deficits taking into account the age of the patient
- No symptoms of shoulder instability, i.e. no history of apprehension or apprehension provoked during clinical testing
- The acute phase has passed or was never evident.

Guide to using the algorithm

- Treatment aims are to be achieved by an approach in which active exercises are the primary tool. Along with active exercises the clinician might choose additional therapeutic interventions, such as passive mobilization, depending on the clinical signs.
- The selection of exercises and treatment modalities should be based primarily on the findings of the clinical assessment and not the structural pathology.
- The clinical assessment is based on an “if this – do that” approach. The yes/no boxes refer to the “weight” of the functional deficit detected, e.g. if no or little muscle performance deficit is detected then the clinician should follow the “no” route, i.e. will continue the assessment in order to determine if a significant reduced cervical and thoracic spine mobility impairment is present. On the other hand if considerable functional muscle deficit is present the clinician should follow the “yes” route, i.e. active exercises to address the muscle deficit.

Fig. 1 Assessment and treatment algorithm for a patient with shoulder pain. ¹Muscle performance deficits may take the form of strength, strength ratio, active or passive length or recruitment pattern deficits. ²Examples of methods to assess symptom reduction with alterations in movement: scapular assistance test [29, 30]; scapular retraction test [30, 31]; change of posture [32]



- Clinical re-assessments should be performed regularly: (1) to determine if the prescribed treatment is addressing the major clinical deficits detected and (2) to address concurrent clinical deficits. For example, if functional muscle deficits resolve following the active exercises prescribed then the yes/no response following re-assessment of muscle performance deficit would be "no". The algorithm should then be explored through the 'no' route to ensure that all clinical features contributing to the presenting shoulder pain are adequately addressed.
- Definite improvements in symptoms (pain, function, muscle performance and/or range of movement) would be expected within 12 weeks. Ongoing improvements may occur after this time.

General principles for prescribing exercises

- Exercises should not provoke the pain with which the patient presented.

- Some mild to moderate pain ($\leq 4/10$ on VAS) due to the effort of doing the exercise can be tolerated but must have subsided within 12 hours.
- The quality of the performance of exercises is crucial and multimodal feedback (e.g. visual, biofeedback, taping) can be used to achieve this. Exercises should be performed with optimal scapular positioning and control without abnormal compensatory trunk movement.
- Start with:
 - Unloaded proceeding to loaded exercises
 - Simple exercises, e.g. targeting one force couple at a time, proceeding to more complex movements involving multiple force couples
 - Slow proceeding to faster exercises
 - Exercises performed in a conscious manner and progress, by gradually decreasing feedback, to more subconscious / automatic exercise performance
- The number of exercises should be limited to a maximum of four
- Dose and progressions relate to the goal of each exercise and should be adjusted in relation to the individual patient.

Discussion

After extensive discussion and debate the experienced shoulder physiotherapists associated with this project were able to reach agreement on a clinical reasoning algorithm to guide the assessment and treatment for patients presenting with local shoulder pain, without significant passive range of motion deficits and no symptoms or signs of instability. It was decided not to include “evidence of partial/small full thickness rotator cuff tear by MRI”, which had been included in the patient description distributed with the initial questionnaire to participants, as part of this clinical scenario because all participants strongly agreed that PT treatment decisions should primarily be based on physical assessment findings. A clinical description was used to describe the target patient population because of the lack of uniformity and reliability of the current diagnostic classification system for shoulder pain [4–7]. The algorithm emphasises that physiotherapy treatment decisions should be based on shoulder physical assessment findings and not structural pathology, and that active exercises should be the primary treatment approach. The algorithm also emphasises the need for regular re-assessment to ensure that all the clinical features contributing to the presenting shoulder pain are addressed.

The consensus position to base physiotherapy treatment decisions on physical assessment findings and not structural

pathology is supported by research relating shoulder symptoms and functional deficits to the presence and extent of structural deficits at the shoulder. Multiple imaging studies have demonstrated the presence of structural tissue failure at the shoulder in people without symptoms [22–24] and a poor relationship has been demonstrated between the level of shoulder pain and disability and the degree of structural deficit detected with imaging [25, 26]. These findings challenge the validity of imaging procedures to identify the source of shoulder symptoms and emphasises the importance of a thorough physical assessment as the basis for determining treatment goals.

During the face-to face meeting, discussions revealed low agreement between participants regarding the rationale for choosing particular exercises to treat shoulder pain. This resulted in the group being unable to reach consensus agreement on a set of specific exercises to incorporate into a treatment program. However, consensus was achieved on a set of guiding principles for implementing exercise therapy for shoulder pain and dysfunction. In summary, such a program should be individually prescribed for each patient and should consist of a limited number of exercises, performed with appropriate scapulohumeral coordination and humeral head alignment, in a graduated manner without provoking the presenting shoulder pain. The consensus position to only prescribe a small number of exercises is supported by research that indicates that lack of time affects exercise adherence negatively [27, 28].

One of the aims of this project was to develop a physiotherapy treatment algorithm to serve as a guide to aid less experienced physiotherapists in the treatment of shoulder pain. Although the clinical reasoning algorithm presented achieved consensus agreement from a group of physiotherapists from various world regions it remains to be seen if it proves helpful for less experienced therapists. A future objective is to field test this algorithm to assess its utility to aid the less experienced clinician to achieve optimal clinical outcomes for patients with shoulder pain.

The process to achieve consensus in this project was protracted. Although this is to be expected of a process designed to integrate the judgments of “experts”, the inevitable communication problems resulting from the lack of uniformity and reliability of the current classification system for shoulder disorders significantly contributed to the length of the process. A significant portion of both face-to-face and virtual meetings was spent clarifying to which shoulder pain patients the algorithm applied. Future research to develop international best practice guidelines should ensure that this issue is not an impediment to efficient progress.

This project employed an informal consultation process between a limited number of physiotherapists with expertise in the treatment of shoulder dysfunction from Europe and Australia to achieve consensus. To further the aim of

determining international best practice guidelines in the treatment of shoulder dysfunction a more structured process involving a more representative sample of physiotherapists with an international reputation for expertise in the treatment of shoulder dysfunction is required. The assessment and treatment algorithm presented in this report could be used as an initial trigger document to begin a more formal extensive consultation process to achieve this end.

Conflict of interest None.

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