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Critically appraised paper of Johnson et al (JOSPT 2007): The effect of anterior versus posterior glide joint mobilization on external rotation range of motion in patients with shoulder adhesive capsulitis.

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Description
This CAP provides a review of the findings from:

Johnson AJ, Godges JJ, Zimmerman GJ, and Ounanian LL (2007): The effect of anterior versus posterior glide joint mobilization on external rotation range of motion in patients with shoulder adhesive capsulitis. *Journal of Orthopaedic and Sports Physical Therapy* 37: 88-99.

Disciplines
Physical Therapy

Comments

Rights

The effect of anterior versus posterior glide joint mobilization on external rotation range of motion in patients with shoulder adhesive capsulitis

Johnson AJ, Godges JJ, Zimmerman GJ, and Ounanian LL (2007): The effect of anterior versus posterior glide joint mobilization on external rotation range of motion in patients with shoulder adhesive capsulitis. *Journal of Orthopaedic and Sports Physical Therapy* 37: 88-99. (Abstract prepared by Jason Brumitt).

Question: Does the direction of force applied during mobilisation of the glenohumeral joint influence range of motion outcomes in patients with adhesive capsulitis?

Study Design: Randomised clinical trial. Glenohumeral external rotation (ER) active range of motion (AROM), pain, and a modified functional questionnaire were measured to compare the effectiveness between the two groups. A standard goniometer was used to measure ER AROM after each treatment session. Pretest and posttest pain measures were assessed utilising a visual analog scale. Each participant answered a 5-item functional questionnaire which had been adapted from a previously developed 21-item questionnaire (L'Insalata et al 1997).

Participants: Fifty-eight patients with a diagnosis of adhesive capsulitis or frozen shoulder were referred by orthopaedic physicians to physiotherapy. Thirty-eight failed to meet the authors stated inclusion/exclusion criteria. Subjects (n = 20) were randomised into one of two treatment groups: the anterior mobilisation (AM) group or the posterior mobilisation (PM) group. Two subjects from the PM group left the study prior to completion.

Intervention: The AM group received the following treatment protocol: continuous ultrasound (1.5 W/cm^2 for 10 minutes) to the anterior shoulder capsule, an anteriorly directed joint mobilisation protocol, and three minutes of upper-body ergometry. The PM group underwent a similar intervention programme except that the ultrasound was directed toward the posterior shoulder capsule and the mobilisation technique was directed posteriorly.

Results: After six treatment sessions the authors reported a significant difference in ER measures between groups with the PM group (mean increase 31.3° ± 7.4°) demonstrating a statistically significant increase ($P < 0.001$) as compared to the AM group (mean increase 3.0° ± 10.8°). Patients in both groups experienced significant decreases in pain ($P = 0.01$).

Conclusion: The authors conclude that PM techniques are superior to AM techniques for increasing glenohumeral ER motion.

Commentary

The cause of idiopathic adhesive capsulitis has eluded physicians and researchers since the condition was coined "frozen shoulder" over 70 years ago (Watson et al 2000). Numerous conservative treatment and surgical approaches for primary adhesive capsulitis have been reported in the literature. Physiotherapists traditionally utilise therapeutic exercise, manual therapy, and modalities when treating individuals with a diagnosis of adhesive capsulitis. However, there is disagreement in the literature as to the effectiveness of manual therapy for this condition (Griggs et al 2000, Diercks et al 2004).

Controlled trials are necessary to demonstrate efficacy of physiotherapy management for patients with primary adhesive capsulitis. In this study, Johnson et al (2007) investigated whether the direction of force applied during a joint mobilisation procedure affects ER ROM in patients with adhesive capsulitis. The results of their investigation suggest that PM techniques are superior to AM techniques for increasing glenohumeral ER motion. However, issues related to study design must be appreciated prior to physiotherapists accepting the conclusion and altering their practice patterns.

The authors excluded 38 potential subjects who had been referred by orthopaedic surgeons to physiotherapy with a diagnosis of adhesive capsulitis. Controlling for potential comorbidities helps clinicians and researchers appreciate the actual treatment effect. The inclusion and exclusion criteria utilised in this study differs slightly from those reported previously in the literature (Griggs et al 2000, Diercks et al 2004). The authors, based upon their "clinical experience and one cadaver study" (Ovesen et al 1985), chose to exclude a patient if his or her ER ROM deficit decreased or if the ER ROM stayed the same as the shoulder was abducted. Of the 38 subjects who had been disqualified from participating in the study, 14 were excluded for this reason. A weakness of this study is that the authors rely upon personal observation and one published report to support this exclusionary criterion. The inclusion and exclusion criteria utilised in this study should have mirrored those previously published in the literature. In addition, the authors failed to describe the process used to identify an ER deficit (for example, visual observation or goniometeric measurement).

The subjects were randomised into one of two treatment groups with the assessor blinded to group allocation. Unfortunately, near the end of the study, the initial assessor accepted a position at another clinic and was unable to continue in the role, meaning that for the remaining six subjects, the primary investigator became the new assessor. The primary investigator's intrarater reliability for measuring ER ROM was excellent ($ICC_{3,1}$ .98, 95% of .95 to .99 for ER ROM). Nonetheless, to reduce the threat of bias it would have been preferable if all of the subjects had been measured by the same, blinded assessor.

Arguably, the greatest threat to this study relates to the homogeneity of the two groups. Adhesive capsulitis is reported to progress over a period of four stages. Each phase is highlighted by functional limitations and pathologic changes. At the start of the study the AM group had a mean duration of symptoms of 8.4 months (range 2 to 12 months) whereas the PM group had a mean duration of symptoms of 10.9 months (range 4 to 60 months). During the 'freezing stage' (3 to 9 months) and the 'frozen stage' (9 to 15 months) the ability of the patient to experience significant ROM changes are limited by pain and pathologic changes (Hannafin et al 2000). It is possible that the AM group failed to respond to the treatment protocol, whereas the PM group demonstrated significant increases, due in part to the particular stage of healing experienced by each group member (Hannafin et al 2000). Providing each group members' mean duration of symptoms would allow the reader to better compare the demographics of each group.

Based upon the threats to study design, the results are less clear as to the optimal manual therapy treatment protocol for patients with AC. Additionally, this study is unable to demonstrate the efficacy of utilising manual therapy or a combined self-stretching and mobilisation therapy program versus only a self-stretching program (Diercks et al 2004). Future prospective investigations should be conducted comparing outcomes of a self-stretching programme (Diercks et al 2004) with outcomes from a physiotherapy programme, utilising both self-stretching and manual therapy treatments.

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