An evaluation of the anatomic basis of the O'Brien active compression test for superior labral anterior and posterior (SLAP) lesions

Green RA, Taylor NF, Mirkovic M and Perrott M (2008): An evaluation of the anatomic basis of the O'Brien active compression test for superior labral anterior and posterior (SLAP) lesions. *Journal of Shoulder and Elbow Surgery* 17: 165-171. (Abstract prepared by Ewan Kennedy)

Background: The O'Brien test is a widely known method for evaluating superior labrum anterior and posterior (SLAP) lesions of the shoulder (Brukner and Kahn 2007). As originally described by O'Brien et al (1998), this test (termed the active compression test) was developed as a diagnostic tool for both labral and acromioclavicular (AC) joint problems, and involves maintaining two shoulder positions against a downward force. The first position is in shoulder flexion 90°, horizontal adduction 10-15°, and full internal rotation (thumb down) with the elbow extended. The second position is the same, but with full external rotation (palm up). A positive test results if pain or painful clicking is elicited during the first position, and reduced or eliminated in the second. Symptoms 'on top of the shoulder' are considered positive for AC abnormality, and those 'inside the glenohumeral joint itself' positive for labral abnormality. The authors propose that the test acts by loading the AC joint from below, and generating tension in the bicipital-labral complex.

Aim: To evaluate the anatomic basis of the O'Brien test for SLAP lesions (specifically, to quantify the active and passive tension in the long head of biceps during the O'Brien test).

Methods: Two complementary studies were performed, one evaluating the active and the other the passive tension in the long head of biceps. Each measured tension in the positive (shoulder flexion, horizontal adduction, and internal rotation) and negative (shoulder flexion, horizontal adduction, and external rotation) positions of the O'Brien test. To clarify the point of examiner contact each position was performed with resistance against the arm above the elbow and again below the elbow.

Active tension was studied in six female volunteers (mean age 21.2 (SD 1.7) years) and six male volunteers (mean age 23.5 (SD 3.7) years) with no history of shoulder problems using surface electromyography (EMG). Muscle recordings were taken from the long and short head of biceps, and the anterior and middle portions of deltoid. Passive tension was measured in three female cadavers (age 58-91 years) using a load cell directly attached to the proximal long head of biceps tendon.

Results: As measured by surface EMG the long head of biceps was more active in the negative than positive position of the O'Brien test in normal volunteers. This was found against both arm resistance (63% more active) and forearm resistance (88% more active). In the cadaveric specimens, passive tension in the long head of biceps was greater in the negative (201 g) than the positive position (-738 g).

Discussion: The study findings are contrary to the proposal by O'Brien et al (1998) that the positive position of the O'Brien test increases tension in the bicipital-labral complex. The increases in active and passive tension in the negative position have an anatomical basis. Shoulder external rotation brings the biceps onto the anterior aspect of the arm, allowing this muscle to actively contribute to shoulder flexion. It also lengthens the intra-articular path of the long head of biceps, thus increasing passive tension. The lack of support for the anatomical basis of the O'Brien test may partly explain variable reports of the clinical accuracy of this test.

Commentary

This excellent study takes a back-to-school approach to examining the O'Brien test for SLAP lesions, and reveals that the anatomical basis is not supported. For clinicians, this is both important and useful. Studies of clinical tests for SLAP lesions have shown poor accuracy, and considerable variability (Mirkovic et al 2005, Munro and Healy 2009). Historically, new tests have been developed and reported to have good accuracy, but researchers re-evaluating the same tests have not produced such good results (Munro and Healy 2009). With such findings, re-examining the validity of SLAP tests is highly appropriate.

Clinically, differential diagnosis of a SLAP lesion requires careful objective testing, as well as careful interpretation of the findings. New clinical tests for SLAP lesions are still emerging (Kim et al 2001, Myers et al 2005), but none has proven definitive. In this environment, evidence-based practice is less about applying the "best" test, and more about applying a reasoned approach to diagnosis. An understanding of the structures under stress during the physical examination is essential, as highlighted by Green et al (2008).

Clinicians utilising the O'Brien test in the diagnosis of SLAP lesions should find this article of interest. It provides a reasoned critique of the anatomical basis of the O'Brien test, and represents an opportunity to review your own differential diagnosis of SLAP lesions.

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Illness perceptions of low back pain patients in primary care: What are they, do they change and are they associated with outcome?

Foster NE, Bishop A, Thomas E, Chris J, Horne Rob, Weinman J, and Hay E (2008): Illness perceptions of low back pain patients in primary care: What are they, do they change and are they associated with outcome? *Pain* 136: 177-187. (Abstract prepared by Meredith Perry)

Aim: To explore how illness perceptions of patients with low back pain (LBP) change over a 6 month period, and associations with clinical outcome.

Methods: A prospective cohort study which involved eight general practices in the United Kingdom (UK). Over a 19 month period, consecutive patients consulting their general practitioner (GP) for LBP were invited to participate and were sent questionnaires to be completed within the first four weeks following consultation. Patients were excluded if the GP suspected a red flag diagnosis. A follow-up questionnaire was sent six months later. Socio-demographic data and number of days off work due to LBP in the past 6 months were collected. LBP questionnaires included: the Roland and Morris Disability Questionnaire (RMDQ); a Global Rating of Change (GroC) in LBP symptoms from baseline to six months and; duration of LBP. The Revised Illness Perception Questionnaire (IPQ-R) was used to explore: the symptoms patients believed to be related to their LBP; the consequences, timeline (acute/chronic), timeline (cyclical), emotional representation, illness coherence of their LBP; and beliefs about the cause of their LBP. A good clinical outcome was defined as a 30% change on the RMDQ and reports of 'improved', 'much improved', and 'completely recovered' on the patients' GRoC. Those participants not meeting the above criteria were considered to have had a poor clinical outcome. Associations between patients, perceptions and poor outcome were analysed using unadjusted and adjusted risk ratios (RR) and 95% confidence intervals.

Results: From the eligible study population of 3097, 1591 and 810 completed questionnaires were received at baseline and 6 months, respectively. Patients had a mean (SD) age of 44 (10.3) years and 59% were women. Mean (SD) RMDQ score at baseline was 8.6 (6.0) and 6.2 (6.1) at 6 months. Three in five (59%) reported at least one day off sick in the last 6 months, due to LBP. Nearly two thirds (63%) of the participants reported that their LBP was of an acute duration (< 3 months), and 11% reported chronic pain lasting for more than 3 years. There was good concordance between the RMDQ and the GroC with 568 participants reporting the same outcome on both measures. 52% and 41% of patients had a poor clinical outcome at 6 months using RMDQ and GRoC, respectively. There was little change in beliefs as recorded by the IPQ-R over the 6 months. There were, however, strong, statistically significant associations (RRs of 1.4 and over) between IPQ-R baseline consequences, timeline (acute/chronic), personal control and treatment control scores and a poor outcome. Patients who expected their back problem to last a long time, who perceived serious consequences, and who held weak beliefs in the controllability of their back problem were more likely to have poor clinical outcomes 6 months after consultation.

Conclusions: These results have implications for the management of patients, and support the need to assess and address patients' cognitions about their back problems in a way that is meaningful for them.

Commentary

The results may not reflect the illness perceptions of all people with LBP; however, this is a well conducted study which raises a couple of interesting points. Firstly, over a six month period participants' illness perceptions did not change and secondly, the IPQ-R can help to identify those with LBP who will have a poor outcome.

The findings of the study also pose a few questions. Are illness perceptions fixed in people with LBP? This requires further research, but when unhelpful illness perceptions are addressed in other clinical populations (e.g. myocardial infarction patients) positive outcomes are demonstrated (Petrie, 2002). Do these findings mean that the GPs in this study were not aware of current LBP guidelines? Advice to keep active, and strategies for self-management are considered best practice for rehabilitation of LBP in the UK, just as they are here. Do these findings mean that GPs still find it difficult to recognise unhelpful beliefs? Evidence suggests that physiotherapists and GPs can recognise unhelpful behaviours and that we are familiar with validated functional and psychosocial screening questionnaires; however, few practitioners actually use these tools. Consequently, illness perceptions and unhelpful beliefs may be based on "intuition" and inadvertently reinforced by consultation time limitations and the practitioners' beliefs (Bishop, 2005; Crawford, 2007; Copeland, 2008). The results found in this study could therefore be replicated with physiotherapists in New Zealand.

The clinical implications of this study are straightforward. We all know that it is important to advise our patients to 'keep active' and to provide strategies which encourage self-management of LBP symptoms. This is advice, however, which makes little sense to someone who perceives their LBP to be a chronic condition over which they exert little control. Advice which is not individualised to address specific perceptions is unlikely to influence and change unhelpful behaviours because knowledge doesn't guarantee either adherence or concordance (Horne, 2006). In New Zealand, physiotherapists are frequently the first contact practitioner; therefore, we should feel confident taking a wider biopsychosocial approach. As well as taking a history and performing various physiological tests we should also be using tools to help us diagnose specific unhelpful beliefs. Each unhelpful belief should then be addressed in an individualised manner, otherwise, an improvement in function and a good outcome should not be expected. At present, the IPQ-R is being developed further to make it less cumbersome and more specific for musculoskeletal conditions seen in clinical settings. For more about the IPQ-R, see: http://www.uib.no/ipq/

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Adherence to sport injury rehabilitation programs: An integrated psycho-social approach

Levy AR, Polman RCJ and Clough PJ (2008): Adherence to sport injury rehabilitation programs: An integrated psycho-social approach. *Scandinavian Journal of Medicine and Science in Sports* 18: 798-809. (Abstract prepared by Sandra Bassett)

Introduction: The Adapted Planned Behaviour Model (APBM) is a two stage psycho-social theoretical model consisting of initiation or decision-making, and maintenance or rehabilitation behaviours. The initiation phase includes the primary factors of threat appraisals (perceived severity and susceptibility), goal orientation (learning goal and performance goal orientation) and attitude to the rehabilitation. These five factors directly influence the rehabilitation intentions which in turn influence rehabilitation adherence. Self-efficacy and self-motivation have roles in both the initiation and maintenance phases by influencing intentions and adherence. Rehabilitation adherence is further influenced by behavioural habits and secondary factors of coping ability (distraction, palliative, instrumental and emotional), treatment efficacy and social support (emotion and listening support and task appreciation and personal assistance from other people).

Purpose: To test the ability of the APBM to predict rehabilitation intentions and adherence in individuals undertaking sport injury rehabilitation for tendonitis-related overuse injuries.

Methods: This was a prospective one-group design in which 70 participants were followed through their rehabilitation. The sample consisted of 44 male and 26 female participants with a mean age of 32.5 years (±10.2), with most of the tendonitis-related overuse injuries being located at the ankle (41%), and lesser numbers at the knee (28%), shoulder (20%) and elbow (11%). Typically, the participants attended two 40 to 60 minute clinic rehabilitation sessions per week for eight to 10 weeks. The rehabilitation protocol consisted of structured progressive exercises and stretching activities, and in the early stages ice, heat and ultrasound were also included. At the beginning of the rehabilitation, participants were measured on self-efficacy, self-motivation, and the primary factors of the APBM (threat appraisals, goal orientation, and attitude to the rehabilitation programme) and rehabilitation intentions. During the rehabilitation attendance at the clinic appointments was recorded, and adherence to the clinic- and home-based rehabilitation were measured. At the end of the rehabilitation the behavioural habits and the secondary factors of the APBM (coping ability, social support and treatment efficacy) were measured.

Results: Regression analyses tested the ability of the psycho-social variables of the APBM to predict intentions, and the ability of the psycho-social variables and intentions to predict adherence. Intentions were significantly predicted by perceived severity, perceived susceptibility, learning orientation and attitude, but not self-efficacy, self-motivation and performance goal orientations. Clinic attendance was predicted by self-efficacy, self-motivation, intention, palliative coping, treatment efficacy, and personal assistance from the family. Clinic adherence was predicted by self-efficacy, self-motivation, intention, distraction and palliative coping, treatment efficacy and task appreciation by the physiotherapist and emotional support from friends. Home-based adherence was predicted by distraction and palliative coping, habit and task appreciation by the physiotherapist.

Conclusion: The findings point to psycho-social variables influencing rehabilitation intentions, clinic attendance and adherence to clinic- and home-based rehabilitation in an interactive manner during sport injury rehabilitation.

Commentary

The findings of this study are similar to those of other research that have tested the ability of the Theory of Planned Behaviour (Ajzen, 1991), and Protection Motivation Theory (Rogers, 1983). This is not surprising as the APBM is a combination of these two models along with the inclusion of other known predictors of adherence, namely social support, coping ability and goal orientation. The findings can be used clinically in four ways.

First, the findings are applicable to any patient grouping in spite of the study being undertaken with people undergoing sport injury rehabilitation. Second, the inconsistent intentions-adherence relationship, with intentions being related to clinic attendance and clinic-based adherence but not to home based adherence suggests it should not be assumed that patients' rehabilitation intentions will translate into treatment adherence behaviours. In everyday life Gollwitzer (1999) notes that intentions do not automatically translate into behaviours, especially when the behaviours are difficult to implement. This is evident in physiotherapy, with patients having difficulty adhering to their home-based physiotherapy programmes because they are required to integrate new behaviours into their already busy daily lives (Sluijs & Knibbe, 1991). One way physiotherapists can facilitate the shift from intentions to adherence behaviours is to select and use behaviour change strategies that patients report useful in their everyday lives (Sluijs & Knibbe, 1991).

Third physiotherapists can use the findings when determining whether non-physical reasons are responsible for poor patient rehabilitation adherence. For example patients who appear unmotivated frequently have low self-efficacy, poor emotional and social coping skills and do not consider that the physiotherapy is efficacious. In this situation physiotherapists can address these issues by initially discussing with patients the value of the physiotherapy, and then suggesting ways to boost their self-efficacy so that they can implement the physiotherapy activities especially those to be undertaken at home. Physiotherapists need to be alert to the coping strategies patients use, particularly those who use emotional coping. These patients should be encouraged to employ more positive coping strategies, such as using actions and cognitions to reduce the pre-occupation with their symptoms and the unpleasantness of their situation, and increase their use of stress relieving strategies. Fourth, physiotherapists can enhance patients' rehabilitation adherence by providing them with encouraging feedback about their level of performance of exercises and other physiotherapy activities.

In conclusion, this study has not only provided a further insight into the multifaceted way in which psycho-social factors influence rehabilitation adherence, but also confirmed the findings of earlier studies. Future research should now turn to ways of improving patients' attitudes towards their rehabilitation leading to optimal rehabilitation adherence, and ultimately improved functional outcomes.

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