



Original article

Clinical assessment of subacromial shoulder impingement – Which factors differ from the asymptomatic population?

Helen Land ^{a,*}, Susan Gordon ^{a,1}, Kerriane Watt ^b^a College of Healthcare Sciences, James Cook University, Townsville, Queensland, Australia^b College of Public Health, Medical & Vet Sciences, James Cook University, Townsville, Queensland, Australia

ARTICLE INFO

Article history:

Received 6 June 2016

Received in revised form

5 November 2016

Accepted 1 December 2016

Keywords:

Subacromial

Impingement

Posterior shoulder

Posture

Scapula

ABSTRACT

Background: To date, the significance of factors purported to be associated with subacromial shoulder impingement (SSI) and what differences, if any, are present in those with SSI compared to a matched asymptomatic population has not been identified. Gaining information about differences between people with SSI and asymptomatic people may direct clinicians towards treatments that impact upon these differences.

Objective: Compare the assessment findings of factors suggested to be associated with SSI; passive posterior shoulder range, passive internal rotation range, resting cervical and thoracic postures, active thoracic range in standing and scapula positioning between cases experiencing SSI and a matched asymptomatic group (controls).

Study design: Case Control Study.

Method: Fifty one SSI cases and 51 asymptomatic controls were matched for age, gender, hand dominance and physical activity level. The suggested associated factors were measured bilaterally. Independent t-tests were used to compare each of these measurements between the groups. Any variables for which a significant difference was identified, were then included in a conditional logistic regression analysis to identify independent predictors of SSI.

Results: The SSI group had significantly increased resting thoracic flexion and forward head posture, as well as significantly reduced upper thoracic active motion, passive internal rotation range and posterior shoulder range than the matched asymptomatic group. No independent predictors of SSI were identified in conditional logistic regression analysis.

Conclusion: Thoracic posture, passive internal rotation range and posterior shoulder range were significantly different between cases experiencing SSI and a matched asymptomatic group.

Level of evidence: Level 3a.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

Multiple types of subacromial shoulder impingement (SSI), (intrinsic, extrinsic and internal), each with different underlying pathomechanical causes, have been proposed (Braman et al., 2013; Lewis et al., 2001; Michener et al., 2003). Anterolateral catching or aching shoulder pain, without a history of trauma, emanating from

the rotator cuff tendons, subacromial bursa, biceps tendon and shoulder capsule or a combination of these structures is characteristic of SSI (Lewis et al., 2001; Michener et al., 2003). Forty to 60 years of age is reported as the peak age for SSI (Ostor et al., 2005; van der Windt et al., 1995) with an increased prevalence of these symptoms reported in occupations and athletes who perform frequent overhead activities (Ludewig and Cook, 2000).

Extrinsic SSI is where “inflammation and degeneration of the tendon occur as a result of mechanical compression by some structure external to the tendon” (Michener et al., 2003). The mechanical factors external to the tendon which may potentially lead to SSI include restriction of the capsule and soft tissues of the posterior shoulder (Hanchard et al., 2004; Michener et al., 2003), altered cervical and/or thoracic posture (Hanchard et al., 2004;

* Corresponding author. James Cook University, Physiotherapy Clinic, Building 500, Townsville, Queensland, 4811, Australia.

E-mail addresses: helen.land@jcu.edu.au (H. Land), sue.gordon@flinders.edu.au (S. Gordon), kerriane.watt@jcu.edu.au (K. Watt).

¹ Present address: School of Health Sciences, Flinders University, Bedford Park, South Australia, Australia.

Lewis et al., 2001; Michener et al., 2003), altered scapula movement (Borstad and Ludewig, 2002; Ludewig and Cook, 2000; Timmons et al., 2012) and dysfunction or weakness of the rotator cuff musculature (Brox et al., 1999; Hanchard et al., 2004; Leroux et al., 1994; Michener et al., 2003; Reddy et al., 2000; Soroohan and Mc Creesh, 2009; Warner et al., 1990).

Glenohumeral instability has been suggested as a contributing mechanism to SSI due to excessive humeral head translation with arm movement resulting in irritation of the same structures within the subacromial space (Lewis et al., 2001; Ludewig and Cook, 2002; Warner et al., 1990). However, clinical presentation and conservative and operative treatments differ for SSI with related instability and SSI without instability (Braman et al., 2013), therefore studies investigating SSI should not group those found to have signs of shoulder instability with those who don't.

In the clinical setting, physiotherapists use past clinical experience, history taking and examination to diagnose SSI. Factors affecting the width of the subacromial space are included in the examination to assist in the diagnosis of SSI and guide the therapist to provide the most appropriate advice and treatment (Soroohan and Mc Creesh, 2009). Orthopaedic special tests currently used to reproduce subacromial pain have either high specificity or high sensitivity, but not both, meaning that no one test can be accurate in diagnosing SSI (Calis et al., 2000; Cleland, 2007; Hegedus, 2012; Soroohan and Mc Creesh, 2009). Hence a minimum of three positive orthopaedic special tests (Michener et al., 2009; Park et al., 2005) and an appropriate history are proposed for diagnosis of SSI.

Evidence based guidelines for the clinical examination of SSI recommend including measurement of shoulder range of motion, cervical and thoracic posture and dynamic scapula motion in addition to orthopaedic special tests (Hanchard et al., 2004). Few studies have described and compared these physical attributes in an asymptomatic group and a SSI group, with most comparative studies examining a single physical factor in isolation. Reduced posterior scapula tilt in the sagittal plane and an elevated position of the scapula in maximum arm elevation was identified, using a 3D electromechanical digitiser, in those with SSI compared to an asymptomatic group (Lukasiewicz et al., 1999). Reducing thoracic spine kyphosis has been shown to increase the range of shoulder flexion and scapular plane abduction in those with SSI and those without (Lewis et al., 2005) and posterior shoulder restriction has been quantified in those with SSI compared to an asymptomatic group using a side lying clinically valid measurement technique (Tyler et al., 2000). However, examination of only one factor between these groups does not consider the dynamic relationship between biomechanical and anatomical factors of the shoulder girdle (Jeremy. S Lewis et al., 2001). Comparison between published studies is difficult with significant variation in participant demographics and diagnostic criteria used to identify SSI.

To date, the significance of factors purported to be associated with SSI and what differences, if any, are present in those with SSI compared to a matched asymptomatic population has not been identified. Gaining information about differences between people with SSI and asymptomatic people may direct clinicians towards treatments that impact upon these differences.

This study describes and compares the assessment findings of passive internal rotation shoulder range, posterior shoulder range, passive cervical and thoracic postures, active thoracic range in standing and scapula positioning between those diagnosed with SSI and an asymptomatic group. Participants were matched for age, gender, hand dominance and physical activity level. The hypothesis

was that there would be a difference in these physical assessment findings between the groups.

2. Methods

2.1. Participant information and consent

Ethical approval for this study was granted by the James Cook University (JCU) Human Ethics Committee (approval: H3945). Written informed consent was obtained from each of the participants.

Participants were recruited from the Townsville community and clients presenting to the JCU Physiotherapy Clinic between June 2011 and July 2013. Recruitment for both groups was via emails and word of mouth to University staff, students and their extended networks. In addition, case recruitment used an advertisement in the local Townsville press and in the waiting area of the clinic. Cases identified with the advertisement 'Do you feel a sharp catch in your shoulder when raising your arm which eases when you lower your arm down? Is this making it difficult for you to wash your hair or reach up into an overhead cupboard or get your shirt on easily? Is it becoming painful to lie directly onto that shoulder at night?' They then contacted the investigator who arranged an assessment to determine eligibility. Controls were asked to be between 40 and 60 years of age with no history of shoulder, neck or upper back injuries and no reports of painful symptoms in any of these areas in the previous twelve months. Both groups were required to meet the inclusion criteria.

2.2. Power analysis

A pre-study sample size calculation was performed based on shoulder passive internal rotation range in those with SSI and those without (mean difference 9° (Tyler et al., 2000), standard deviation 12° (Borstad et al., 2007)) with alpha = 0.05 and power 0.8 (Altman, 1991). A minimum of 45 cases and 45 controls was calculated to be needed. However, values for the postural and scapula measurements were not available from the literature. Ethical approval was obtained to recruit up to 100 participants in each group, if available, to ensure the results were robust.

2.3. Inclusion and exclusion criteria

Forty to 60 year old participants were recruited for this study to reflect the reported peak age for SSI (Ostor et al., 2005; van der Windt et al., 1995). Symptom free volunteers as well as people with unilateral shoulder pain completed a screening questionnaire to determine their eligibility for this study. The questionnaire was used to exclude participants, in both the case and control groups, who had:

- Been participating in intense shoulder strength training during the 6 months prior to entering the study. This was defined as high load upper body weight training two or more times per week.
- Recent (within previous two years) or current pregnancy. This exclusion was necessary due to the effect of ligamentous laxity and postural changes associated with pregnancy.
- Previously undergone shoulder surgery or suffered a fracture of the shoulder girdle
- Glenohumeral instability identified by a grade 2 or 3 anterior, posterior or inferior load and shift test (assessed objectively) or a history of shoulder dislocation

Download English Version:

<https://daneshyari.com/en/article/8924703>

Download Persian Version:

<https://daneshyari.com/article/8924703>

[Daneshyari.com](https://daneshyari.com)