



Original article

Reliability, agreement, and diagnostic accuracy of the Modified Lateral Scapular Slide test

A. Shadmehr^a, H. Sarafraz^{b,*}, M. Heidari Blooki^c, S.H. Jalaie^d, N. Morais^e^a Department of Physiotherapy, School of Rehabilitation Tehran University of Medical Sciences, (TUMS), Tehran, Iran^b Department of Physiotherapy, School of Rehabilitation, International Campus, Tehran University of Medical Sciences (IC-TUMS), Tehran, Iran^c Iranian Red Crescent Society (IRCS), Rehabilitation Center, Bandarabbas, Iran^d Biostatistics, Department of Physiotherapy, School of Rehabilitation, Tehran University of Medical Sciences, (TUMS), Tehran, Iran^e Polytechnic Institute of Leiria, School of Health Sciences (ESSLei), Campus 2 – Morro Do Lena – Alto Do Vieiro, 2411-901 Leiria, Portugal

ARTICLE INFO

Article history:

Received 21 September 2015

Received in revised form

10 April 2016

Accepted 12 April 2016

Keywords:

Diagnostic accuracy

Lateral scapular slide test

Reliability

Scapular asymmetry

Scapular position

ABSTRACT

Background: The Lateral Scapular Slide Test is a static test used in clinical settings to assess medio-lateral inferior angle displacement and scapular asymmetry at three different degrees of shoulder abduction. However, there is no evidence in the literature about the reliability and diagnostic accuracy of a modified LSST (arm elevation in the scapular plane with loading) in a symptomatic population.

Objective: To assess the intra- and inter-rater reliability, agreement, and diagnostic accuracy of the MLSST (Modified Lateral Scapular Slide Test) in subjects with and without shoulder symptoms. A new test position is examined, in which the arm is held in 90° of elevation in the scapular plane with 1 kg load.

Design: Within day intra- and inter-rater reliability, agreement, and diagnostic accuracy study.

Method: Participants included 25 (42 ± 2.7 years) subjects with shoulder symptoms and 25 (40 ± 2.1 years) asymptomatic control subjects. Two raters, blinded to each other's outcomes, measured the distance between the inferior scapular angle and T7 at arms by the side, hands on hips and 90° of arm elevation in the scapular plane with 1 kg load. Measurements were performed twice, bilaterally. Intra-class correlation coefficient (ICC), minimal detectable change (MDC_{95%}) and diagnostic accuracy were calculated.

Results: The ICCs for intra- and inter-rater reliability were good to high in both shoulders of symptomatic and asymptomatic groups. The MDC_{95%} in the symptomatic group ranged between 0.67 and 1.40 cm in the symptomatic shoulder and 0.72–1.16 cm in the asymptomatic shoulder. The asymptomatic group presented a MDC_{95%} ranging between 0.63 and 1.52 cm in the dominant and 0.60–1.41 cm in the non dominant shoulder. Positive and negative likelihood ratios ranged between 0.67–5.50 and 0.81–1.11, respectively.

Conclusion: The MLSST had good reliability and agreement properties to assess scapular position in both groups. However, no test position had clinical utility as a diagnostic criterion for shoulder pathology.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

Shoulder joint function may be affected by changes in scapular position and motion. Several studies have shown that altered scapular position and motion, commonly termed scapular

dyskinesia, can significantly impact on shoulder joint stability (Mueller et al., 2013), muscles' force generation (Kebaetse et al., 1999; Kibler and McMullen, 2003; Kibler et al., 2006) and length tension capacities (Borstad, 2006), range of motion (Kebaetse et al., 1999), and quality of movement (Ludewig and Reynolds, 2009). Any muscle imbalance affecting the shoulder complex may change scapular kinematics and the symmetry of shoulder motions. Thus, scapular asymmetry is often considered as a related factor to the development or perpetuation of shoulder pain and disability and used as a diagnostic criterion to identify patients at risk of developing shoulder symptoms (Lukasiewicz et al., 1999; Hebert et al.,

* Corresponding author. Department of Physiotherapy, School of Rehabilitation, International Campus, Tehran University of Medical Sciences, (IC-TUMS), Enghelab Ave, Pitech-e-shemiran, Zip: 11489, Tehran, Iran. Tel.: +98 2177533939; fax: +98 2177534133.

E-mail addresses: hsarafraz@razi.tums.ac.ir, sarafraz1361@yahoo.com (H. Sarafraz).

2002; Uhl et al., 2009; Kawasaki et al., 2012; Klintberg et al., 2015). However, there is controversy and debate among clinicians and researchers regarding whether scapular asymmetry does predispose the shoulder to pathology (McClure et al., 2009; Kibler et al., 2013; Morais and Pascoal, 2013; Hosseinimehr et al., 2015).

The Lateral Scapular Slide Test (LSST) is proposed as a practical, quantitative method for assessing medio-lateral inferior angle displacement and recognizing scapular symmetry in clinical settings (Kibler, 1998). Side to side comparison is done between the distances of the thoracic spine to the inferior angle of the scapulae and performed in 3 different arm positions: one, arms by the side; two, hands on hips; three, 90° of shoulder abduction with the thumbs pointing downwards (maximal internal rotation of the shoulders). Although this is a relatively simple test to perform, the literature shows conflicting results in the measurement properties of the LSST to identify scapular asymmetry. While some authors have reported reasonable reliability and agreement, and recommend its use in clinical practice (Gibson et al., 1995; McKenna et al., 2004), others found less adequate compatibility in this regard (Gibson et al., 1995; Odom et al., 2001; Shadmehr et al., 2010; Ozunlu et al., 2011). Moreover, the clinical utility of the LSST remains inconclusive. Several studies using the LSST as a diagnostic criterion for determining scapular asymmetry in subjects with and without shoulder pain, found that the ability of this test to differentiate between symptomatic and asymptomatic shoulders is questionable (Odom et al., 2001; Koslow et al., 2003; Nijs et al., 2005; Shadmehr et al., 2010). Asymmetry in scapular position between sides is often assumed as pathological. However, asymmetrical scapular position is reported in both symptomatic and asymptomatic populations confounding the interpretation (Uhl et al., 2009; Seitz et al., 2012b; Morais and Pascoal, 2013; Hosseinimehr et al., 2015).

Considering that dynamic scapular stability and mobility strongly depends on the contribution of the muscular system, a modified LSST (MLSST) is proposed to load the shoulder muscles to assess if this modification further highlights side to side differences in scapular position between symptomatic and asymptomatic shoulders (Struyf et al., 2009). The MLSST introduces 2 variations to the original LSST: one, in 90° of shoulder abduction a load of 1 kg is added; and two, a further position is added of unloaded arm abduction to 180°. Struyf et al. (2009) recommend the modifications when testing populations with shoulder symptoms to refine the measurement and clinometric properties of the LSST. Shadmehr et al. (2014) further proposed that the MLSST be done with the arm in the scapular plane instead of the coronal plane because this position was more reflective of the neuromuscular control of the scapula whereas the coronal plane could be more reflective of glenohumeral joint capsule and ligamentous restrains. Additionally, abnormal scapular position and motion may be better recognized during arm elevation performed in the scapular plane (scaption) when compared with the coronal plane (shoulder abduction) (Giphart et al., 2013).

Thus, the aim of this study was to determine the reliability, agreement and clinical utility of the MLSST, particularly the new test position, 90° of shoulder abduction in scaption with 1 kg load, to rule in or rule out scapular asymmetry as a factor related with the presence of shoulder pathology.

2. Materials and methods

2.1. Study design

This was a two groups, two assessors, repeated measures study. Intra- and inter-rater reliability and agreement, and diagnostic accuracy were investigated. The intra- and inter-rater reliability

and agreement study was performed following the Guidelines for Reporting Reliability and Agreement studies (GRRAS) (Kottner et al., 2011). For the diagnostic accuracy study, the Standards for Reporting of Diagnostic Accuracy (STARD) was used (Bossuyt et al., 2003).

2.2. Subjects

Twenty-five ($n = 25$) subjects complaining of shoulder pain were recruited from two private physical therapy clinics and one outpatient physical therapy division of a general hospital. During the same period, a general announcement among hospital personnel was held to recruit subjects free from symptoms. The aims and procedures of the study were explained, and prior to participation, volunteers had to sign an informed consent form. Subjects then underwent clinical examination by an orthopedic surgeon, complemented with diagnostic imaging (MRI and ultrasonography imaging) on both shoulders to screen for abnormalities, such as partial rotator cuff tears or tendinopathy. The orthopedic surgeon then established and reported the final diagnosis, taking into account both clinical and imaging findings, and referred the subjects to the research team. This study was approved by the ethics committee.

2.3. Inclusion criteria

All recruited subjects had to be between 18 and 65 years old and be able to actively perform 90° of shoulder abduction in scaption with maximal internal rotation while holding 1 kg weight in their hands. Subjects in the symptomatic group had to be diagnosed with unilateral shoulder pathology by an orthopedic surgeon.

2.4. Exclusion criteria

Subjects were excluded if they had any of the following conditions: regular engagement in unilateral overhead sports or professional activities, previous shoulder surgery, history of systemic disease or neuromuscular disorder, limited cervical motion, fracture of the upper limb, leg length discrepancy, deformities of the vertebral column (e.g., scoliosis), and body mass index (BMI) equal or greater than 29.9 (obesity). Obesity would make it difficult to identify body landmarks by means of palpation. Subjects were also excluded if they showed abnormal MRI or ultrasound images (e.g., partial rotator cuff tears) in their asymptomatic shoulder (symptomatic group) or shoulders (asymptomatic group) and if they complained of bilateral shoulder pain or pain that was triggered by provocative maneuvers at the neighboring anatomic regions (e.g., cervical spine) during physical examination (Manske and Ellenbecker, 2013).

2.5. Instruments

A digital Vernier caliper with an accuracy of 0.01 mm (Mitutoyo Company, Japan), a goniometer (Lafayette Company, USA) and 1 kg weight were used in this study.

2.6. Raters

Two physical therapists with 10 years of clinical experience in the assessment and intervention of musculoskeletal conditions of the upper body quadrant performed all measurements. Before study initiation, they underwent familiarization with the standardized measurement procedures of the study and took a practice trial on 10 subjects for over approximately 2 h. The outcomes of the two independent raters were used to test inter-rater reliability. For

Download English Version:

<https://daneshyari.com/en/article/2624911>

Download Persian Version:

<https://daneshyari.com/article/2624911>

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