

Do stingers affect scapular kinematics in rugby players?

Kawasaki T, Maki N, Shimizu K, Ota C, Urayama S, Moriya S, et al (2014) Do stingers affect scapular kinematics in rugby players? *Journal of Shoulder and Elbow Surgery* 23(12):e293–e299. doi 10.15619/NZJP/43.3.07 (Abstract prepared by Sharada Murty)

Abstract

Aim: The rationale of this study was to investigate shoulder examination findings that are associated with scapular dyskinesis. This cross-sectional epidemiological study investigated the hypothesis that upper limb nerve traction injuries ('stingers') alter scapular kinematics in high-school rugby players.

Methods

One hundred and sixty-five male Japanese high-school rugby players, without previous shoulder or elbow surgery or injury within the past month were recruited. Demographic data, including level of competition and injury history, were collected via a questionnaire. Three examiners (medical doctors) blinded to subjective data, completed physical examinations of both shoulders of each participant which included assessment of impingement, instability, shoulder girdle muscle strength, posterior capsular tightness and palpation of the acromioclavicular joint. Examiners evaluated scapular kinematics through video analysis and classified the type of scapular movement observed using the scapular dyskinesis test (4-type method).

Results

Analysis of inter-rater reliability of assessment of scapular dyskinesis showed moderate reliability. Six subjects were excluded from further analysis as there was a lack of consensus on their classification. Of the 159 remaining players, 16 demonstrated scapular dyskinesis. Of these, 13 were classified as Type I dyskinesis and three exhibited Type III dyskinesis. Statistical analysis of the relationship between scapular dyskinesis and each of the examination findings demonstrated a significant association of Type I scapular dyskinesis with previous history of stingers.

Conclusion

There is a significant association between Type I scapular dyskinesis and previous history of stingers in male high-school rugby players. The scapular dyskinesis test using the 4-type method is moderately reliable in measuring altered scapular motion.

Commentary

Abnormal scapular kinematics or scapular dyskinesis is associated with shoulder pathology including impingement, instability and acromioclavicular joint injury (Kibler et al 2013). Identification of factors that may influence scapular dyskinesis is important to establish appropriate injury prevention and rehabilitation protocols. However, evaluation of scapular dyskinesis necessitates a reliable method of assessment.

The authors of this paper have previously hypothesised that nerve traction injury to the shoulder results in scapular dyskinesis of the injured side (Kawasaki et al 2012). They suggest altered scapular dyskinesis may be due to neurological impairments and resultant disruption to neuromuscular coordination of scapular motion caused by traction to neural tissue. In this study, male high-school rugby players were assessed to identify findings related to the shoulder which may

be associated with altered scapular kinematics (which were observed, recorded by video and analysed by three examiners). Each examiner reported the presence or absence of scapular dyskinesis and categorised scapular movement patterns observed during shoulder flexion and abduction while the participant was holding a 3kg weight.

There are various recommendations for the assessment of scapular dyskinesis in the literature. Many of the assessment methods utilised clinically use a two-dimensional model to assess three-dimensional scapular motion. Despite this, there is consensus surrounding the use of the scapular dyskinesis test (referred to in this study as the 4-type method), which is reliable and easily administered clinically (Kibler et al 2013). Scapular movement is classified as: Type I, raising of the inferior angle of the scapula; Type II, raising of the length of the medial border; Type III, elevation of the superior border; Type IV, normal (Kibler et al 2013). Visual observation of scapular movement and determination of the presence or absence of dyskinesis is noted.

A multivariate analysis was used to evaluate the association between scapular dyskinesis and assessment findings. Only Type I scapular dyskinesis revealed a sample large enough to allow statistical analysis, with a significant association reported between Type I scapular dyskinesis and previous history of a stinger in high-school rugby players. This association has also been reported in adult rugby players (Kawasaki et al 2012, Vaccaro et al 2002). The authors of this study suggest that stingers cause scapular dyskinesis. As with other shoulder pathology there is strong evidence of the presence of altered scapular kinematics in players with a history of nerve traction injury but it is not evident whether this is a cause of pathology or the result of it (Kibler et al 2012). It is likely that many factors contribute.

Nerve traction injury affecting the upper limb is a common injury in collision sports, reported to occur in up to 50% of players (Vaccaro et al 2012). Symptoms are due to either traction of the brachial plexus or C5/6 nerve root causing shooting pain and/or paraesthesia down the arm to the hand (Kawasaki et al 2012). Weakness may or may not occur and symptoms usually last minutes or hours, and very rarely more than a day. Due to the usually transient nature of symptoms, players may not seek assessment or treatment before return to sport. The guidelines for return to play following a stinger injury include complete resolution of symptoms, return to baseline range of motion and strength (Vaccaro et al 2012). Despite following these guidelines, exacerbation of symptoms often occurs with relatively minor secondary trauma. The results of this study suggest that it is also important to assess scapular mechanics, and rehabilitation programmes should correct scapular dyskinesis before return to sport.

This study provides evidence for reliable methods of assessment of scapular dyskinesis. The authors report a clear association between nerve traction injury and altered scapular kinematics. Clinically, the findings of this study suggest assessment of scapular motion is important following stinger injury. Rehabilitation including strategies to restore normal mechanics before return to sport may minimise further injury.

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