

Isometric Peak Force of Shoulder Rotators in Cricketers with and without History of Shoulder Pain

Juneja, H¹, Verma², S.K., Khanna³, G.L.

¹Ph.D student, Department of Sports Sciences, Punjabi University, Patiala. India email: hemantjuneja@rediffmail.com

²Professor, Department of Sports Sciences, Punjabi University, Patiala. India e mail: satishsk1@rediffmail.com

³Dean, Faculty of Allied Health Sciences, Manav Rachna International University, Faridabad, Haryana, India email : glkhanna@gmail.com

Abstract

Aim: To find out the differences in Shoulder External and Internal Rotator strength and their ratios in cricketers with and without history of shoulder pain.

Background: Throwing activity imposes specific demands on shoulder muscles leading to imbalances especially between the External rotators (ER) and Internal rotators (IR). This study aims to investigate the isometric strength differences of shoulder ER and IR in cricketers with and without history of pain.

Materials & Methods: 52 healthy subjects between the age group of 16-18 with a mean age of 16.97 ± 0.55 years were recruited for this study. The subjects were divided into two groups a) those with history of pain (PH) which restricted throwing within the past 2 years- Group 1 and b) no history of pain (NPH)-Group 2. Isometric Shoulder External Rotator (ER) and Internal rotator (IR) maximal force was measured and Isometric ER: IR ratios were calculated.

Results: Significant differences were found in the isometric strength of ER and consequently ER:IR ratios between the two groups. However, no differences were found in the IR force between the two groups. PH group showed a mean ER force (in kg) of $7.38 \pm .71$ (SD) while the mean ER force in NPH Group was 9.90 ± 1.32 (SD). ER: IR force ratios were found to be $0.60 \pm .045$ in the PH group while in the NPH group it was $0.82 \pm .049$.

Conclusion: The results of our study suggest that Isometric strength differences in shoulder rotators exist between sportspersons with and without history of shoulder pain. In addition to the advanced techniques of muscle force evaluation such as isokinetics, isometric measurements can also play an important role in evaluating muscle force.

Key words: External Rotators, Internal Rotators, Isometric, Isokinetic, Throwing

Introduction

Shoulder injuries in sports involving throwing actions are extremely common and often result in prolonged periods of absence from sporting activities (*Aagaard & Jorgensen, 1996; Wang & Cochrane, 2001; Kettunen et al, 2011*). The glenohumeral joint is inherently unstable due to its bony configuration and the degrees of freedom of movement.

Therefore, it is dependent to a great extent on the ligaments and muscular structures to provide stability. High speed throwing actions requires frequent and synchronized activation of these stabilization mechanisms, specially the shoulder rotator muscles (*Bayios et al, 2001; Yildiz et al, 2006*). During the acceleration phase of throwing, the supraspinatus, infraspinatus and teres minor work eccentrically to provide