Comparison of Range of Motion Characteristics between Competitive Baseball Pitchers and Tennis Players

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Baseball pitching and the tennis serve are similar in terms of the explosiveness of the upper extremity motion performed, yet the kinematics of the movements are not identical. Shoulder range of motion (ROM) characteristics have been shown to adapt to the specific loads placed on the tissues such as bones, muscles and joint capsule. Therefore comparison of shoulder ROM characteristics between athletes in these sports should reflect the specificity of stresses applied to the shoulder in each sport. PURPOSE: To assess glenohumeral ROM characteristics in competitive baseball pitchers and tennis players. **METHODS:** Fifteen intercollegiate pitchers and 13 competitive tennis players participated. Athletes with shoulder pain in past 6 months were excluded. Glenohumeral internal rotation (IR), external rotation (ER), flexion, abduction, extension ROM, and posterior shoulder tightness (PST) were assessed on the dominant shoulder using a standard goniometer by the same investigators. Total rotation ROM was calculated as the sum of IR and ER ROM. The average of the three trials was used for analysis. Each variable was compared between groups using independent sample t-tests. Statistical significance was set a priori at p< 0.05. **RESULTS:** Pitchers had significantly greater IR (p = 0.01, mean difference: 7.0 °), extension (p = 0.001, mean difference: 17.1 °), and total rotation ROM (p = 0.042, mean difference: 9.4 °) compared to the tennis players. ER, flexion, and abduction ROM, and PST were not different between the groups (p > 0.05). **CONCLUSION:** The anterior glenohumeral joint capsule is the primary restraint to the humeral extension movement. One possible explanation for the greater extension ROM in pitchers is greater anterior joint capsule laxity from hyper-angulation of the humerus occurring more with pitching than with serving. Loss of IR ROM accompanied by loss of total rotation ROM has been attributed to increased PST. However, loss of total rotation ROM in tennis players was present without increased PST in this study. This may suggest that osseous adaptation, not measured in this study, may have influence on the ROM difference between the groups. Further investigation of osseous and soft tissue adaptation is needed to understand the shoulder characteristics differences between these two groups of overhead athletes.