GLENOHUMERAL ROTATION AND SCAPULAR POSITION CHANGE FOLLOWING COMPETITIVE HIGH SCHOOL SPORTS

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Pathologies such as anterior instability and impingement have been linked to decreases in internal rotation (IR) and increases in external rotation (ER) motion. There is also a strong association with scapular dyskinesis. **Objective:** To measure glenohumeral (GH) IR and ER motion and scapular position throughout the course of an overhead sports season.

**Design and Setting:** Participants were measured pre and post season for scapular upward rotation at 0°, 60°, 90°, and 120° of GH abduction in the scapular plane; scapular protraction at 0°, hands on hips, and 90° of GH abduction.; IR and ER were measured supine with the scapula stabilized. **Subjects:** Forty-three high school overhead athletes (women’s volleyball (VB), men’s (MS) and women’s swimming (WS), and women’s tennis (TN) \[n = 7 \text{ males} \text{ (age} = 15.75 \pm 1.58 \text{ years, mass} = 144 \pm 21.96 \text{ kg, and height} = 68.63 \pm 2.50 \text{ inches)} \text{ and 36 females} \text{ (age} = 15.29 \pm 1.18 \text{ years, mass} = 128.13 \pm 20.99 \text{ kg, and height} = 64.63 \pm 2.81 \text{ inches} \}] \text{ with no history of shoulder or elbow surgery participated in this study. Measurements:} \text{ Pre and post-season measurements for scapular upward rotation; scapular protraction; IR and ER were taken on both extremities. A Saunders Digital Inclinometer (The Saunders Group Inc. Chaska, MN) was used for scapular upward rotation and GH ROM; A Vernier Caliper (Mitutoyo model number 505-633-50 Measurement Technology. UK) was used for scapular protraction. Results: Pre-season demonstrated more IR than post-season (p=0.047). VB exhibited more dominant arm IR than MS (=0.006), TN had more IR than both WS (p=0.036), and MS (p=0.001). VB and TN exhibited more non-dominant arm IR compared to WS (p=0.007), (p=0.002) and MS (p=0.039) (p=0.009). ER decreased in the dominant arm from pre to post-season in both WS (p=0.004), and MS (p=0.003). Scapular measurements also revealed significant findings. WS dominant arm scapular upward rotation at 90° increased over time (p=0.001). MS also had more non-dominant arm scapular upward rotation at 90° than TN (p=0.025). Overall scapular protraction for the dominant arm at 0° of abduction was more at pre-season than post-season (p=0.021).

**Conclusion:** High school athletes demonstrate significant decreases in IR following a 12 week competitive season. Our findings suggest that posterior capsule tightness may have caused these changes in IR deficits and overtime may result in scapular position changes and increases in ER.

**Key Words:** Scapular dyskinesis, posterior capsule, digital inclinometer