LITERATURE BRIEF OF CORRELATIONS TO ELBOW VALGUS TORQUE

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Professional players: (n=40)
After multiple linear regression found that 4 variables were responsible for 97% of variance in elbow varus stress: shoulder abduction at FC (less abduction have less varus torque), peak shoulder horizontal adduction angular velocity (less angular velocity related to lower stress), elbow flexion at instant of peak varus torque (greater flexion related to less stress), and maximum shoulder external rotation torque (greater magnitudes of shoulder torque related to less elbow stress) (Werner et al, 2002).

Adult players: (n=69)
Two-way ANOVA found 6 variables correlated to elbow varus torque. Max shoulder rotation, elbow flexion at peak valgus torque, and elbow valgus loading rate account for 68% of elbow varus torque variance. Torque increased with greater MER and decreased with increased elbow flexion at ball release. Higher elbow flexion at peak elbow torque was associated with less torque. Players who initiated trunk rotation before FC had significantly higher torque than those who rotated after FC. Side arm pitchers had greater elbow varus torque and less ball velocity (Aguinaldo et al 2009).

Youth players: (n=14)
Step-wise linear regression of 136 kinetic and kinematic variables found 4 variables associated with elbow varus torque (after controlling for body weight and height). Max shoulder abduction torque, and max shoulder internal rotation torque accounted for 85% of elbow varus torque variance. When only investigating kinematic variables, Maximum external shoulder rotation accounted for 33% of variance. Magnitude of torque was closely related to weight (Sabick et al 2004).

High school: (n=72)
T-tests between players who demonstrated excessive vs not excessive contralateral trunk tilt. Players who did demonstrate excessive contralateral tilt had higher ball velocity, great elbow proximal force, shoulder proximal force, elbow varus torque, shoulder internal rotation torque. Pitchers with excessive contralateral tilt had less upper torso flexion at FC, less upper torso rotation, greater contralateral flexion at MER and BR (Oyama et al 2013).

