Development of Arm Injuries in Youth Baseball Players as They Mature: A 10-Year Prospective Study

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INTRODUCTION: Arm injuries are commonly encountered in baseball as young athletes play into adulthood. The purpose of this study was to examine the incidence of arm injury and risk for surgery in adolescent baseball players followed over a 10-year period beginning in youth leagues and/or school through their highest level of competition.

METHODS: Prospective study was conducted enrolling 261 middle and high school baseball players in 2010-2012 then followed for 10 years or until retirement from competitive baseball. Players were included in study if fully participating in team activities at the time of pre-season study enrollment. Players with prior upper extremity (UE) surgery or those diagnosed with time loss UE injury within the past year were excluded. Any overuse UE injury requiring treatment by school athletic trainer or physical therapist with additional referral to sport medicine or orthopaedic physician was reported in the study. Musculoskeletal overuse injuries were classified based on the orchard injury classification system. Incidence proportion (IP) and 95% confidence intervals (CI) for initial injury and injuries requiring surgery were calculated.

RESULTS: Pitchers were 14.2+/-2.6 years old at enrollment and followed for an average of 4.3 ± 2.8 years with an average age of injury 15.4± 2.7 years old. Twenty percent of the cohort was followed for 7 or more years. The overall injury incidence was 25.6/100 athletes (95% CI=21 to 31) with a surgical cumulative incidence of 5.4/100 athletes (95% CI= 3.2-8.8). The odds of experiencing an elbow injury (n= 38) was similar to that of experiencing a shoulder injury (n=25) (RR= 0.7; 95% CI= 0.4- 1.1). The athletes also presented with a similar frequency of requiring surgery regardless of the injured body part. However, the risk of surgery in those playing above high school level was 4.3 times greater (95% CI, 1.2-15.0) than those only playing high school.

DISCUSSION AND CONCLUSION: This is the first study to follow a large cohort of youth baseball players as they progress showing a relatively high arm injury incidence. Interestingly, the rate of shoulder and elbow injuries were similar but surgical risk increased playing beyond high school, in particular for the elbow. Proper injury prevention and training should be employed to minimize risk among young baseball players.