

229

ASSOCIATION OF HIP RANGE OF MOTION AND UPPER EXTREMITY KINETICS IN YOUTH BASEBALL PITCHINGG Oliver, H Plummer, R Johnson, T Holt, L Henning, W Weimar. *Auburn University, Auburn, USA*

10.1136/bjsports-2014-093494.229

Background The overhead throwing motion requires the coordination of efficient segmental actions between the lower and upper extremity. The complexity of the overhead throwing motion, especially in pitching, may be affected by restriction in lower extremity range of motion [ROM].

Objective The purpose of this study was to determine the relationship between lower extremity ROM and upper extremity kinetics during baseball pitching.

Design Cross-sectional study.

Setting Controlled laboratory setting. Youth sports.

Participants 12 baseball pitchers (811.1±1.2 yrs.; 44.0±6.7 kg; 152.3±6.4 cm), free from injury, with 2.4±1.2 years of pitching experience volunteered.

Interventions Independent variables were hip internal (IR) and external (ER) ROMs. Dependent variables were shoulder and elbow kinetics.

Main outcome measurements Outcome measurements consisted of hip IR and ER ROM, and shoulder and elbow kinetics. Shoulder and elbow kinetics were assessed at maximum shoulder external rotation (MER) and maximum shoulder internal rotation (MIR) of the pitching motion. The relationship between hip ROMs and kinetics were assessed with Person Product Correlation Coefficients ($P \leq .05$).

Results A significant negative relationship was evident between left hip IR ($r = -0.82$, $P = .02$), right hip ER ($r = -0.76$, $P = .04$) and elbow valgus forces at the point of MER. A negative relationship between right hip ER and shoulder distraction forces ($r = -0.82$, $P = .02$) at MIR was evident as well.

Conclusions These data suggest that there was a complex relationship between hip ROM and upper extremity kinetics during baseball pitching. This may be the first documentation establishing an association between lower extremity ROM and upper extremity kinetics during youth pitching. With elbow and shoulder injuries on the rise in youth baseball, identifying pathomechanics that result in increased joint forces is paramount. Further research is necessary to identify specific mechanisms of injury to the upper extremity associated with lower extremity function.