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Biomechanics of Pitching: Horizontal Abduction Predicts Power; Power Predicts Strikeouts and Wins

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Traditional strength training for pitchers focuses on compound lifts, predominantly of the lower extremity, to increase pitching power. Though widely employed, this approach has not been sufficiently validated. **PURPOSE:** To evaluate both predictors and consequences of increased mechanical power in collegiate pitching. **METHODS:** 10 pitchers from a D1 baseball program underwent 4 days of assessment separated by at least 3 days of rest: 1) Squat max was performed and recorded, 2) Sparta force plate (Sparta Science, USA) captured load, explode, and drive. 3) Proteus (Boston Biomotion, USA) measured power and endurance in 10 movements: Left and right core rotation, internal and external rotation, shoulder flexion and extension, elbow flexion and extension, and horizontal adduction and abduction. 4) Proteus recorded throwing mechanics via 5 sets of pitches (4 reps per set) at varying loads of magnetic resistance, ranging from 1-5lbs. For all movements, Proteus calculated and exported power and endurance in 3D space. Linear regressions identified predictors of pitching power and the effect of power on pitching performance. Owing to the small sample and novel technology, trends ($p < 0.08$) were considered. **RESULTS:** Mean pitching endurance did not significantly predict strikeouts or wins. Mean pitching power predicted greater win percentage ($R = 0.734$; $p = 0.024$), total strikeouts ($R = 0.662$; $p = 0.052$), and strikeouts per game ($R = 0.656$; $p = 0.055$). No associations were found between Sparta data or squat max and win percentage or strikeouts. Pitching power had no relationship with Sparta data, squat max, height, weight, class year, or arm length. The strongest predictors of pitching power were horizontal abduction endurance in the dominant arm ($R = 0.941$; $p = 0.002$) and non-dominant arm ($R = 0.934$; $p = 0.002$). Strikeouts per game was related to win percentage ($R = 0.680$; $p = 0.044$). **CONCLUSION:** Power was the most important predictor of on-field pitching performance. It was unrelated to anthropometric variables and showed no association with minor differences in maturation (e.g., freshman to sophomore). There was also no association with force plate and squat performance. These preliminary data suggest training horizontal shoulder abduction may correspond to power; in turn, power appears to increase strikeouts and win percentage.