

Relationships between spin bowling technique and spin

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Background: Previous research has considered spin to be a major contributor to spin bowling success¹. Relatively few investigations have sought to identify the aspects of technique associated with spin rate. The scarcity of finger spin bowling research has led to coaching and talent identification of spin bowlers to be based on anecdotal evidence², which recommends that the optimal technique is one where the pelvis and shoulders rotate from a side-on position during the delivery stride, to front-on at ball release³.

Aims: To identify the key kinematic parameters of an elite finger spin bowler's technique which can predict spin rate.

Methods: 23 elite finger spin bowlers bowled ten maximal spin rate deliveries of a good length in an indoor practice facility. An 18 camera Vicon Motion Analysis system was used to collect three-dimensional kinematic data. Fifty-six 14 mm retro-reflective markers were attached to the subject to calculate joint kinematics. All marker trajectories were filtered using a fourth-order low pass Butterworth filter with a cut-off frequency of 30 Hz. Spin rate was recorded using the Doppler radar system, Trackman. The three trials with maximum spin rate were averaged and 30 kinematic parameters were determined for each trial. The effect of interactions between the spin bowling technique parameters and spin rate were investigated using Pearson product moment correlation analyses and stepwise linear regression.

Results: The 23 bowlers produced spin rates in the range 1432 - 2143 rpm (1685 ± 170 rpm) along with ball release speeds 17.7 - 23.4 m/s (20.4 ± 1.3 m/s). Eight of the 30 kinematic parameters were found to be linearly correlated with spin rate: back foot orientation at back foot contact; front foot orientation at front foot contact; pelvis orientation at front foot contact and ball release; minimum pelvis orientation between back foot contact and ball release; shoulder orientation at ball release; minimum shoulder orientation from back foot contact to ball release; pelvis shoulder separation at front foot contact. The highest variation in spin rate was explained using one technique variable: pelvis orientation at ball release, which explained 43.1% of the observed variation in spin rate. However, pelvis orientation at front foot contact could explain a similar level of variation in spin rate explaining 42.9%.

Discussion and Conclusions: Coaching literature has previously suggested that the optimal technique for a finger spin bowler is one where the pelvis and shoulders rotate from a side-on position during the delivery stride, to front on at ball release³. The results of this study suggest that higher spin rates can be achieved by using a finger spin bowling technique where the pelvis orientation is less side-on than previously recommended. This allows a larger pelvis-shoulder separation angle and a shoulder orientation short of side-on at FFC. During the FFC phase, the segments should then rotate sequentially, starting with the pelvis and finishing with the pronation of the forearm. The results of this investigation are likely to be very useful in the coaching of finger spin bowlers, as well as talent identification.

References:

1. Chin, A., et al. Sports Biomech, 8, 187-198.
2. Feros, S.A., et al. J Sci Med Sport, 20, 1040.
3. Woolmer, B., & Noakes, T. Bob Woolmer's art and science of cricket. London: New Holland.