

Contribution of Upper Body Kinematics on Tennis Serve Performance

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Abstract : Tennis serve is characterized as one of the most prominent techniques pertaining to the success of winning a point. The study was aimed to explore the contributions of the upper body kinematics on the tennis performance during Davis Cup (Oceania Group). Four Indian International tennis players who participated in the Davis Cup held at Indore, India were inducted as the subjects for this study, with mean age 27 ± 4.79 Years, mean weight 186 ± 6.03 cm, mean weight 81.25 ± 7.41 kg, respectively. The tennis serve was bifurcated into three phases viz, preparatory phase, force generation phase and follow through phase. The kinematic data for the study was recorded through the high speed canon camcorder having a shuttle speed of 1/2000, at a frame rate of 50 Hz. The data was analysed with the motion analysis software. The descriptive statistics and F-test was employed through SPSS version 17.0 for the determination of the undertaken kinematic parameters of the study, and was computed at a 0.05 level of significance with 46 degrees of freedom. Mean, standard deviation and correlation coefficient also employed to find out the relationship among the upper body kinematic parameter and performance. In the preparatory phase, the analysis revealed that no significant difference exists among the kinematic parameters of the players on the performance. However, in force generation phase, wrist velocity ($r= 0.47$), torso velocity ($r= -0.53$), racket velocity ($r= 0.60$), and in follow through phase, torso acceleration ($r= 0.43$), elbow angle ($r= -0.48$) play a significant role on the performance of the tennis serve. Therefore, players should ponder upon the velocities of the above segments at the time of preparation for the competitions.

Keywords : Davis Cup, kinematics, motion analysis, tennis serve

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