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Differences between time-motion characteristics and serving velocity in winning and losing matches of elite male tennis players – A pilot study

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INTRODUCTION:

Tennis is a game characterized by physical activities such as running at different speeds, accelerations, decelerations, changes of direction, slides and different strokes [1]. Therefore, mechanical loads (e.g., accelerations and decelerations) are more relevant to the dimensions of the court than the locomotive loads (eg. total distance, running at different speeds). Besides time-motion characteristics, it is useful to measure serving velocity (SV) because it is one of the most important performance determinants in both gender's tennis in the junior age [2], and serves are the most repeated strokes in the game that directly influences the outcome of points [3]. The aim of this study was to examine differences in time-motion characteristics, including mechanical load and SV, between winning and losing match conditions of elite male tennis players.

METHODS:

Four elite male tennis players (one of them ATP world-ranked) played simulated matches on an indoor clay court in a round robin system, resulting in a total of six matches. To determine the time-motion characteristics, mechanical load-related parameters were measured using portable micro-sensors (Catapult OptimEye S5, Catapult Sports, Melbourne, Australia) which sampled at a frequency of 10 Hz for the GPS and 100 Hz for the tri-axial accelerometer, gyroscope and magnetometer. Regarding the SV, the peak velocity of the first- and second serves was measured with a radar gun (Pocket Radar Ball Coach, model PR1000-BC, Pocket Radar Inc., Santa Rosa, CA). Descriptive statistics were used to present mean and standard deviation results, and Mann-Whitney U test was used to determine the differences between winning and losing match conditions. Significance level was set at $p < 0.05$.

RESULTS:

Only one significant difference between the two conditions was found for the mechanical load in the high deceleration/minute parameter ($U=5$, $Z=-2.08$, $p=0.037$, $r=-0.60$). Regarding the SV, we found significant difference in favor of winning matches for both the first ($U=1$, $Z=-2.72$, $p=0.006$, $r=-0.79$) and second serve ($U=2$, $Z=-2.56$, $p=0.010$, $r=-0.74$). Apart from these, there was no significant difference for the other variables.

CONCLUSION:

Overall, the results suggest that the velocity of the first and second serves is an important factor in the success of tennis matches. With a high SV, players can hit more aces and win points more efficiently. Therefore, serving speed training is important because SV seems to be a fundamental predictor of match results.

1. Kilit & Arslan, Int J Perform Anal Sport, 2017
2. Fitzpatrick et al., Int J Perform Anal Sport, 2019
3. Kovalchik & Reid, J Sports Sci Med, 2017

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