JOURNAL of SPORTS SCIENCE & MEDICINE

Journal homepage

ISSN: 1303 - 2968

©Journal of Sports Science and Medicine (2012) 11 , 600 - 605

Research article

Acute Effects of Static Stretching, Dynamic Exercises, and High Volume Upper Extremity Plyometric Activity on Tennis Serve Performance

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ABSTRACT

The purpose of this study was to compare the acute effects of static stretching; dynamic exercises and high volume upper extremity plyometric activity on tennis serve performance. Twenty-six elite young tennis players (15.1 ± 4.2 years, 167.9 ± 5.8 cm and 61.6 ± 8.1 kg) performed 4 different warm-up (WU) routines in a random order on non-consecutive days. The WU methods consisted of traditional WU (jogging, rally and serve practice) (TRAD); traditional WU and static stretching (TRSS); traditional WU and dynamic exercise (TRDE); and traditional WU and high volume upper extremity plyometric activity (TRPLYP). Following each WU session, subjects were tested on a tennis serve ball speed test. TRAD, TRSS, TRDE and TRPLYO were compared by repeated measurement analyses of variance and post-hoc comparisons. In this study a 1 to 3 percent increase in tennis serve ball speed was recorded in TRDE and TRPLYO when compared to TRAD ($p < 0.05$). However, no significant change in ball speed performance between TRSS and TRAD. ($p > 0.05$). ICCs for ball speed showed strong reliability (0.82 to 0.93) for the ball speed measurements.The results of this study indicate that dynamic and high volume upper extremity plyometric WU activities are likely beneficial to serve speed of elite junior tennis players.

Key words: velocity, warm-up, power, potentiation, ball speed

Key Points

- After the traditional warm up in tennis, static stretching has no effect on serve speed.
- Tennis players should perform dynamic exercises and/or high volume upper extremity plyometric activities to improve their athletic performance.