Vertical jumping performance during the time course of two consecutive beach volleyball games

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Introduction
Vertical jumping constitutes an important activity in some sports (e.g., volleyball and basketball) and is considered as a performance criterion or an indicator of training intervention in other sports. The interpretation of mechanical parameters by a biomechanical approach has received considerable attention in the past, while there is a redundancy of research data about optimal execution and performance in vertical jumping (e.g., Bobbert et al, 1996). However, the systematic investigation of this ability when it is required to be highly developed during a competitive activity, like beach volleyball, has not been examined. The purpose of this study was to examine possible variations in vertical jumping performance characteristics during the course of two consecutive games in beach volleyball.

Methods
Sixteen physical education students (Men (N=8): 22.1±1.0 years, 84.0±8.1 kg, 184.3±5.9 cm, Women (N=8): 21.9±0.7 years, 66.5±9.7 kg, 169.8±6.9 cm,) with experience in beach volleyball participated in a two-game tournament. Two four-team pools (1 male and 1 female) were designated and games followed the double elimination system. Subjects performed 2 maximum countermovement jump trials before the start and at the end of each game, and also at the end of each set on a portable force platform (Kistler, type 9286AA). Force data were sampled at 750 Hz and each subject’s best trial was used in subsequent analysis. The number of sets won differed between teams and therefore data analysis involved six out of a total number of 8 measurements. To account for differences in body weight, the mechanical parameters of power, impulse and work were expressed relative to BW. One factor repeated-measures ANOVAs were applied to statistically examine possible variations across measurements separately for males and females (p<.05).

Results
During the time course of the 2 games, males showed significantly (p<.05) greater values in all examined jump parameters compared to females (Fig.1). Males showed significant differences (p<.05) among measurements in jump height (4th vs 6th) (Fig. 1A) and power (2nd vs 6th, 4th vs 5th and 4th vs 6th) (Fig. 1B). Females exhibited significant differences among measurements (1st vs 4th and 4th vs 5th) in impulse (Fig. 1C) and work (Fig. 1D), respectively.

Discussion/Conclusion
Beach volleyball is characterized by a significant number of vertical jumps during the course of the game. In a tournament, a team will compete in a minimum of 2 up to a maximum number of 4 games within the same day. In our study, jump height values were lower for males and females than those reported for state-level beach volleyball players by Bishop (2003), while absolute peak power was also found to be lower compared to the study of Hertogh & Hue (2002). Our results showed that, during the course of 2 consecutive games, vertical jumping and the examined mechanical characteristics exhibited an increasing trend towards the end of the 2nd game, thus not confirming our hypothesis that the elapsed time of 2 games could induce fatigue. On the contrary, both male and female players were found to have an improvement in their performance in the 2nd game. Due to the game’s physiological demands and the specific environmental conditions, beach volleyball players are trained to endure fatigue and perform maximally after many hours of competition. Therefore, we propose that vertical jumping performance in beach volleyball is further investigated in the time course of 4 games.

References