Original research papers

BIOMECHANICAL ASSESSMENT OF STRENGTH AND JUMPING ABILITY IN MALE VOLLEYBALL PLAYERS DURING THE ANNUAL TRAINING MACROCYCLE

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Abstract

Introduction. The aim of the study was to determine the changes in the peak torque of the knee extensors and flexors of the dominant lower limb, the shoulder internal and external rotators of the dominant upper limb, and the shoulder extensors and flexors of the dominant upper limb as well as the changes in jump height in volleyball players during the annual training macrocycle. ***Material and methods.*** The study involved 13 volleyball players from a Polish second-league team. The measurements were performed five times: before the preparation period (T_1), at the beginning of the competitive season (T_2), in the middle (T_3) and at the end of the first competition period (T_4), and after the competitive season (T_5). The torque of the knee muscles and shoulder rotators was measured in isokinetic conditions, and the torque of the shoulder extensors and flexors was assessed in isometric conditions. Jumping ability was tested using a piezoelectric platform. ***Results.*** We observed statistically significant differences ($p < 0.05$) in jump height and relative peak torque between the measurements, except for the torque of the shoulder external rotators and flexors. The results of multiple factor analysis based on 5 sets composed of 5 strength variables revealed differences between subjects and measurement sessions. ***Conclusions.*** The results obtained indicate that strength and jumping ability should be assessed regularly during the competitive season. The findings of the study suggest that it is necessary to modify the training methods used during the preparation period and individualize the training in the final phase of the competition period.

Key words: volleyball, muscle torque, jump height, annual macrocycle