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BIOMECHANICAL EVALUATION OF VOLLEYBALL PLAYERS FORCE AND VELOCITY SKILLS

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ABSTRACT

Evaluation of selected motor skills of professional volleyball players is presented in the paper. Measurements of such quantities as moments of muscle forces and kinematic parameters of attack were carried out.

Keywords: biomechanics, volleyball.

INTRODUCTION

Evaluation of sportsmen motor skills, correctness of their movements as well as their technique are the essential part of sports training. Modern measurement methods, based on biomechanics and anthropometry, enable objective quantitative and qualitative analysis of motion system. Precise measurements of such quantities as movement kinematics and forces acting on and in people's body can be performed. Biomechanical analyses of volleyball players, presented in this paper, were carried out on the basis of these methods.

The aim of this research was to elaborate and verify research methodology, based on modern measurement systems, enabling objective analysis of player's motion system, their motor skills and results of the training.

Within the framework of this work biomechanical analysis of force and force-velocity skills has been carried out. The group of 7 she-players took part in the research, who play in the Silesian University team. All of them were professional players who had been training volleyball for at least 7 years. Force and force-velocity evaluation has been done on the basis of:

- measurements of muscle forces in isokinetics conditions performed on Biodex 4 Pro System
- vertical jump performed on AMTI dynamometric platform
- balance measurements performed on AMTI dynamometric platform.

RESULTS AND CONCLUSIONS

Evaluation of players' force skills has been carried out on the basis of measurement results of maximal muscle forces in the knee joint, performed in isokinetics conditions with speed 60 deg/s.

Evaluation of force-velocity skills was conducted on the basis of vertical jump with and without swing. Jump height, acceleration and power were analyzed. Those enabled the determination of symmetry coefficient between left and right lower limb.

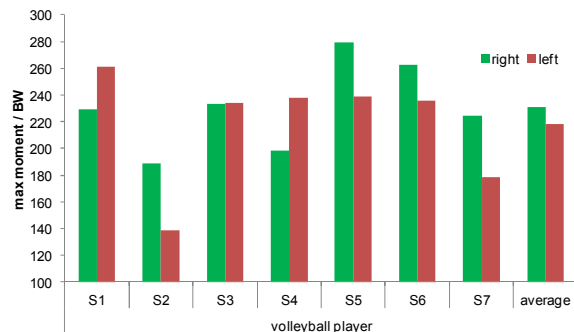


Fig. 1 - Results of moments of muscle forces - knee extensors

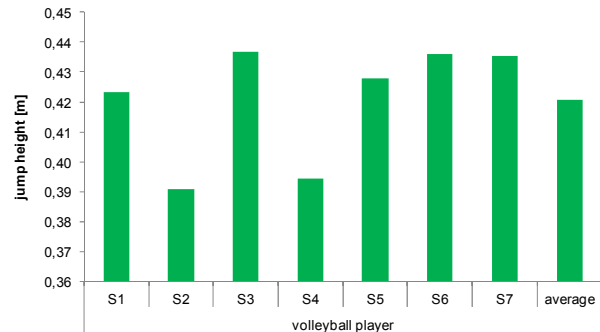


Fig. 2 - Maximal height of center of mass during vertical jump with swing

Obtained results indicate the necessity of individual, personalized training for all players. Authors of this paper are going to elaborate and implement a training program enabling periodic evaluation of force abilities of players. It should enable verification and modification of training methods and their personalized utilization.

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