

SCIENTIFIC RESEARCH OF THE KINEMATICS OF VOLLEY-BALL ATTACK

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Introduction

Modernly applied measurement methods derived from biomechanics and antropomotrics permit an objective qualitative and quantitative functional evaluation of motion system.

Unfortunately even though the methods allowing the motion analysis with the usage of e.g. optoelectronic systems are for a long time applied in biomechanical research, however with reference to various sport disciplines are still rarely used. In case of the similar examination of volley-ball players the research was conducted by among the others: [Chenfu Huang, 2007], [Li-Fang Liu, 2008] and [Kuhlmann, 2007].

The aim of this work were the elaboration of methodology and carrying out the examination of the kinematics of volley-ball attack. Within the framework of the work the kinematic quantities were proposed, they allow to evaluate the correctness of volley-ball attack performance. The examination was done on chosen she-players from AZS Politechnika Śląska volley-ball team.

Methods

The measurement of kinematic quantities was done within the usage of measurement system MVN Biomech by XSENS, which is composed of 17 inertial and magnetic sensors and gyroscopes being disposed on the segments of the body of examined person. The research was done on the group of 3 she-players from AZS Politechnika Śląska team.

Results

Every examined player did the series of 10 attack. The results obtained in all trials were averaged. The analysis of kinematics of volley-ball attack was conducted on the basis of chosen kinematic quantities, which are essential for the correctness of volley-ball attack performance. In the proposed methodology of the research of volley-ball attack evaluation the analysis of the following kinematic quantities was used: the kinematic quantities describing particular attack phases and the maximal ball speed – being the

parameters decisive about attack effectiveness. The following parameters were analyzed in the research:

- parameters of a run-up phase: the lengths of 1st and 2nd step of a run-up,
- jump parameters, like: jump length, jump height, range of a forward, flight phase time, time of a jump,
- quantities describing angular position of the body segments of players in the particular attack phases.

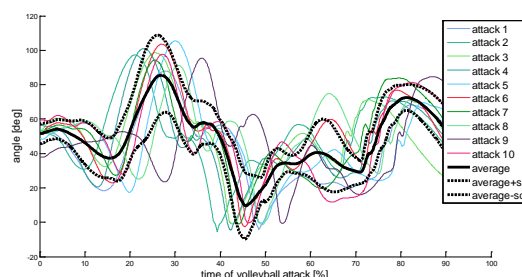


Figure 1: Courses of left knee angle during volleyball attack of one of volleyball players

Discussion

In the conducted research the movement of the particular players' body segments was analyzed and also the quantities enabling an objective quantitative evaluation of the correctness of volley-ball attack were searched. The proposed here research methodology allows the evaluation of the correctness of volley-ball attack performance, and then the correction and appropriate formation of players' motion standard.

Acknowledgement

The work was realized within the framework of the project no. N N501 043940 financed from National Science Centre.

References

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- Kuhlmann C. at all., XXV ISBS Symposium 2007, Ouro Preto – Brazil
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