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DETERMINANTS OF TRAINING EFFICIENCY IN BASKETBALL PLAYERS

Abstract. The work presents the study results of the technical and physical preparation level of highly qualified basketball players, as well as the level of development of their aerobic and anaerobic functions, taking into account playing functions.

Keywords: aerobic and anaerobic functions; highly qualified basketball players; physical and technical training; playing functions; training system.

Introduction. At the present stage, the system of sports training of basketball players should fully reflect and take into account the actions that the athlete performs during the competition [6]. Modern basketball requires athletes to have high functional training and perfect mastery of all the techniques of the game. It has been proved that physical training is of great importance for the growth of basketball players' sports skills, and its organic relationship with technical training, which determines the effectiveness of the training process [6-8]. The scientific substantiation of this relationship will allow to effectively preparing high-class basketball players during many years of training.

Research on this issue [3-5] suggests that the rapid development of achievements in world sports requires a continuous search for new, more effective means of technical and physical training of basketball players. Assessment and

analysis of the training system and results of performances of the strongest athletes in the world show that success can only be achieved as a result of many years of training [3].

The relevance of the study is due to the need to analyze the existing system of physical and technical training of basketball players, which will make it possible on a scientific basis to select purposefully the means and methods of training to improve the structure of complex training. The need to identify the main aspects of physical and technical training of basketball players and determined the choice of research topic.

The paper presents the results of the study of the level of technical and physical fitness of highly qualified basketball players, as well as the level of development of their aerobic and anaerobic functions, taking into account the game functions. According to the results of the study, it was established the necessity of increasing the effectiveness of the training system high-growth players, as well as the fact that the systemic training used in basketball, despite the positive changes, does not provide to some extent sufficient impact on the energy functions of highly qualified basketball players.

The purpose and objectives of the study: to determine the level of physical and technical preparation of highly qualified basketball players.

Material & methods. 81 sportsmen took part in the experiment designed determine the level of technical and physical preparation of the basketball players. All of them were honored masters of sports and masters of sports of the international class.

The examination included 9 special tests [3]. When conducting laboratory examinations cycloergometer, for the purpose of determining the level of aerobic and anaerobic possibilities of basketball players, measurements of the size of pulmonary ventilation, the level of oxygen consumption and the allocation of carbon dioxide, and the frequency of cardiac contractions (cardiology) were carried out. 74 honored masters of sports and masters of sports of international class took part in this experiment.

Presentation of the main research material. As it is seen, the time of the 6-m running of the basketball players of central functions is 1.30 ± 0.041s, which is lower than in the forwards ($1.36 + 0.035$s) and defenders (1.23 ± 0.031s). But it should be borne in mind that the difference is only between the indicators of the center players and defenders ($P > 0{,}99$). This indicates that the starting speed of the defenders is better than the starting speed of the central players. Analyzing the data of the 20-meter running, it turns out that the forwards and the center players are inferior to the defenders with a high level of reliability difference between the indicators. The maximum speed at the distance in the center players is lower than that of the forwards and defenders. The increase in speed at the run from 6 to 20 cm in the center players is $1.5 + 0.104$ m / sec, and it is 1.7 ± 0.124 m/ sec in defenders ($P > 0.98$). Thus, we see that tall basketball players, especially those, who perform

the functions of central players, are inferior to the defenders both in the initial acceleration and in the possibility of developing the maximum speed at the distance and in the results of 20-meter running. However, it should be noted that in quite a number of indicators that characterize speed qualities of basketball players (35% of the total number), the difference is absent or insufficient. This suggests significant positive changes in the training system of speed qualities of highly qualified basketball players.

The high jumping analysis revealed a low level of development of this quality in the highly qualified basketball player. The results of the jump height in the basketball players of different playing functions, as evidenced by the results of the studies, are different. The defenders' jump height is 57.7 + 2.71 cm, which, on average, is by 8.2 cm higher than in center players and by 5.3 cm higher than in the forwards (P> 0.999 and P> 0.98, respectively).

The correlation analysis, carried out by us, between the height data and the jump height indicators in highly qualified basketball players showed that there is a rather high but negative dependence (P = -0.589). The studies have shown that in terms of the development of general and special high-speed endurance in basketball players of high qualification, there are significant reserves, especially in the center players.

The average factor in the Cooper test in the center players is 2845.3±91.98 meters; it is 3075.5±53.55 meters in the forwards, and 3087.9±71.48 meters in defenders (P>0.900 among all the indicators). The difference between the average indicators of the center players and defenders significant and makes up 242.6 m, whereas between the center players and the forwards it is 239.2m. It should be noted that the height of the forwards, as well as of the central players is above 200 cm.

The indicators of special high-speed endurance show the same results. During the test, the average indicator in the 3x40m running is 569.9 ± 10.04m in the center players, 581.2±6.52m in the forwards and 548.8±10.92m in the defenders. The difference between the indicators of the center players and the forwards is 20.3 (P>0.99); it is 23.9 m (P>0.99) between the center players and defenders and 3.5 m (P>0.95) between the forwards and defenders.

The analysis of the study results of the highly qualified basketball players' technical training has shown that the advantage of the defenders over the center players and forwards is observed in almost all indicators, with the exception of two: the work time in the basketball shooting test and overall work ability in shots. This suggests that the level of technical training of tall players has significant reserves, especially in passing the ball using one "weaker" (usually the left hand) hand from the shoulder, and in foul shot. It is known that during the match, tall players, and especially center players, most often perform foul shots. However, they have a lower scoring rate of 25.15±0.875 (83.8%), while a scoring rate of defenders is 26.5±0.689 (88.3%). The reliability of the difference between the indicators is high - P>1.98.

A significant contribution to the problem of assessing the level of physical training may be the study of the functional capabilities of basketball players [1-4].

As it is known, one of the most important indicators of physical work capacity, which characterizes the level of development of aerobic functions, is the maximum oxygen consumption. In basketball players of high qualification, this indicator reaches the value of 58.5±5.59 ml/kg/min. These values of the maximum O_2 consumption are lower than the similar indicators of representatives of other types of sports.

It should be noted that in the representatives of cyclic sports, the maximum oxygen consumption reaches 70ml/kg and above [2]. Relatively small values are recorded in other indicators that characterize the level of development of aerobic and anaerobic performance of sportsmen. Average indicators of critical power in highly qualified basketball players made up 1741 kg/m min., PANO-60.7%, PWS 170-1325 kg /m min; the total "excess" of lCO_2 emission is 4.86 1.

The analysis of the functional capability indicators of highly qualified basketball players, taking into account their game functions, showed that the reliable difference between them is observed in 25.9% of cases. The difference between the indicators of the central players and forwards is significant in 16.6% of cases, between center players and defenders - in 55.5% of cases and between forwards and defenders - 5.5% of cases.

Conclusions. 1. The studies have revealed that in 20.2% of cases, there is no difference between physical training indicators or the difference is uncertain in players with different playing functions. In the technical training indicators, this percentage is 30.5. This shows, on the one hand, the certain progress in the system of training of highly qualified basketball players, and on the second hand, this shows the necessity to increase the efficiency of the training system of tall players, especially of the players performing functions of “center players”.

2. The determination of the maximum of aerobic and anaerobic performance indicates that, despite positive changes, the training system used in basketball, influence upon the energy functions that form the basis of both general and special endurance. This is evidenced by the data obtained from basketball players of various game functions, however it does not fully shows sufficient reliability.

Prospects for further research consist in the selection of means and methods to increase the level of development of technical and physical fitness of highly qualified basketball players.

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