IMPROVING THE ATTACKING ACTIONS OF TOP-LEVEL BASKETBALL PLAYERS USING SPECIALIZED AND RELAXATION-HYPOXIC EXERCISES

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ABSTRACT

The article presents the results of a study of the methodology effectiveness aimed at improving the attacking actions of top-level basketball players using specialized (test) and relaxation-hypoxic exercises during off/in season preparation. In the given analysis of the dynamics of the indication of the cardiorespiratory reaction of basketball players during the pedagogical experiment, as well as indicators of the volume and effectiveness of attacking actions during their participation in official competitions.

Keywords: Top-level basketball players, attacking actions, test and specialized exercises, relaxation-hypoxic exercises, cardiorespiratory reaction, oxygen deficiency (O_2), current recovery.

THE RELEVANCE OF THE ISSUE

In modern basketball, according to the most prestigious competitions - which are the World Championships, the Olympic Games, NBA, Euroleague and Asian Championships, where famous forwards are playing, there are often cases when not all attacking actions, and even rapid counterattacks with a fast break, result in successful attacks. Such consequences are explained by specialists as instability of shooting ability, insufficient psychological immunity to different distracting factors, decreased performance due to an increase in signs of local fatigue, etc. [1, 2, 3, 4, and 5]. There is evidence that a decrease in the effectiveness of attacking actions occurs due to the insufficient development of anaerobic endurance of basketball players, which limits the hypoxic resistance of the body to oxygen deficiency [6, 7].

Long-term observation of the training process of the leading national teams and the personal coaching experience of the author of this article give reason to believe that the oxygen deficiency arising from basketball players under the influence of multidirectional speed loads leads to a decrease in the effectiveness of attacking actions. Moreover, the deficit of oxygen (O_2) that increases during the load causes a state of latent “motion sickness” (loosening or loss of body balance), and has a negative impact on the coordination and accuracy of the throwing act, which was noted in the research of F.A. Pulatov [8]. Therefore, in our opinion, to increase the effectiveness of attacking actions and the effectiveness of shooting abilities, it is necessary to apply not only simulated game (model various game situations) and competitive exercises, also during and after training loads, short recovery pauses in the form of relaxation-hypoxic exercises should be used.

The purpose of this research is to explore the effectiveness of the methodology for improving the attacking actions of top-level basketball players using specialized and relaxation-hypoxic exercises during the off/in-season preparation.

Research methods and organization of a pedagogical experiment. The pedagogical experiment was organized from June 1, 2017 to June 1, 2018 with the involvement of basketball players of the teams "Elektroapparat" (Tashkent) as a control group (CG - 15 people) and "SC MORU" (Tashkent) as an experimental group (EG - 12 people). In both groups, statistical indicators of the volume and effectiveness of attacking actions were studied using the statistical computer program "FIBA LifeStats"[1] during their participation in the competitions of the Championship of Uzbekistan of the season 2018 - 2019. Training sessions in the CG, both during the experiment and during its participation in the Championship, were conducted according to the regular program. However, the EG training program differed by including the relaxation- hypoxic exercises developed by the author and Kent Katich Yoga Exercise Series (San)[2].

Note: Relaxation and hypoxic exercises were applied daily in the morning during the light training (morning session), after the first and second sets of exercises, as well as after training sessions and competitive games and Kent Katich Yoga Exercise Series were applied two times per week after morning session.

The studies were carried out using the following methods: analysis of relevant scientific information; methodological tests to assess the speed of movement, volume and effectiveness of shooting; heart rate measurement; determination of respiratory rate.

Results and its discussion. A study of the dynamics of the dribbling speed and shooting efficiency, followed by the measuring of the cardiorespiratory response in the basketball players of the control and experimental groups under the experimental conditions, revealed an extremely important tendency that the results of a number of pedagogical tests for example, shuttle running with dribbling - 131.6 m ., and the test "40 shots in 4 circles", do not always depend on the level of speed potential and technical skill of the player. They can be mainly dependent on the actual value of the functional reaction of the player's body (organism) while performing these tests. The validity of this assumption was confirmed by the data of the 11-month experiment. In particular, the shuttle run speed with dribbling is 131.6 m. in the CG before the experiment was 36.7 ± 0.53 sec., and in the EG this value was equal to 35.9 ± 0.47 sec. (table#1).

Table#1: Dynamics of the speed of movement and effectiveness of shots considering cardiorespiratory reaction in basketball players of the control and experimental groups during the research (X ± σ)

Motor and functional tests	Group	Before the experiment	After experiment	Difference of indicators
Shuttle run with dribbling (131.6 m.) (Sec.)	CG EG	36.7 ± 0.53 35.9 ± 0.47	36.2 ± 0.51 31.5 ± 0.39	+0.5 +4.4
Heart rate: *- before the test (bpm)*	CG EG	69.7 ± 5.24 68.5 ± 4.16	73.5 ± 3.47 65.2 ± 2.55	-3.8 +3.3
- after the test	CG EG	163.6 ± 9.61 162.3 ± 9.42	165.9 ± 10.33 146.7 ± 6.64	+2.3 +15.6

[1] **FIBA LiveStats** is a computer program (presents by Genius Sport) for maintaining game statistics online, which makes it possible to obtain statistics on game actions individually for each player and the team as a whole. Used by the Basketball Federation of Uzbekistan at the games of the Championship of Uzbekistan among men's teams, starting in 2017.

[2] **Kent Katich** - Founder and developer of physical training and injury prevention programs based on the use of yoga elements (methods). He is the coach of many leading athletes in the world in various sports, including basketball. In 2010, Katich was involved in the NBA team Los Angeles Clippers (USA) as a yoga instructor.

Respiratory rate: *- before the test (times / min.)*	CG EG	14.5 ± 2.06 13.7 ± 2.13	15.8 ± 2.17 11.3 ± 1.65	-1.3 +2.4
- after the test	CG EG	43.6 ± 4.27 44.8 ± 4.35	44.9 ± 4.61 39.5 ± 3.07	-1.3 +5.3
Test "40 shots in 4 circles": (qty)	CG EG	19.3 ± 2.53 18.7 ± 2.44	20.9 ± 2.85 27.8 ± 3.29	+1.1 +9.1
Heart rate: *- before the test (bpm)*	CG EG	65.4 ± 5.62 66.3 ± 5.75	68.3 ± 7.78 64.2 ± 4.07	-2.9 +2.1
- after the test	CG EG	163.7 ± 7.15 164.2 ± 7.03	165.9 ± 7.65 151.5 ± 7.35	-2.2 + 12.7
Respiratory rate: *- before the test (times / min.)*	CG EG	14.1 ± 2.15 14.3 ± 2.11	15.2 ± 2.27 12.3 ± 1.72	-1.1 +2.0
- after the test	CG EG	41.7 ± 4.05 42.5 ± 4.16	43.3 ± 4.59 38.6 ± 2.87	-1.6 +3.9

By the end of the experiment, the dribbling speed of CG basketball players who trained according to the regular program was accompanied by a tendency to slightly improve the running time of the set distance (+ 0.5 sec.). And in the EG, which trained according to the experimental program the following results were achieved - decreased from 35.9 ± 0,47 sec., Up to 31.5 ± 0,39 sec. The difference in improving speed activity with dribbling in this group reached 4.4 seconds. Moreover, the heart rate before the test was performed before the start of the experiment in the CG was 69.7 ± 5.24 bpm, and after the test load was completed, it increased sharply with amount of 163.6 ± 9.61 bpm. By the end of the experiment period, the heart rate before performing the same test significantly increased and reached 73.5 ± 3.47 bpm, and after the test load it increased even more than the value recorded before the experiment. The reaction of heart rate to the performance of this test among basketball players of the EG was characterized by favorable dynamics by the end of the pedagogical experiment. So, for example, before the experiment, before performing the test load, the heart rate in this group was 68.5 ± 4.16 beats / min., after the test it was 162.3 ± 9.61 beats / min., which almost did not differ from the typical values, registered in CG. However, by the time the experiment was completed, heart rate indicators in basketball players of the EG were characterized by decreased performance of the rhythmic reaction of the myocardium to the test load, which indicates a favorable effect of relaxation-hypoxic exercises on the body of basketball players of this group. This assumption is also confirmed by a comparative analysis of the dynamics of indication of Respiratory rate recorded in basketball players of both groups under the same similar experimental conditions. In particular, before the start of the experiment in CG Respiratory rate right before the test was 14.5 ± 2.06 times / min., and at the end of the experiment this value even slightly increased to 15.8 ± 217 times / min. Such a consequence, apparently, was caused by the use of a "continuous" load without directed use of short-term recovery pauses during training. Of course, a similar level of indication of Respiratory rate, from a physiological point of view, is not characteristic of individuals who systematically engage in sports. It should be assumed that it is precisely such a background reaction of breathing rhythm found in this group that led to a significant increase in Respiratory rate after the test load was completed, both before (43.6 ± 4.27 times / min) and after (44.9 ± 4 , 61 times / min) the experiment.

Similar effects were found according to the results of shooting efficiency test using the "40 shots in 4 circles" test and the cardiorespiratory reaction of the examined basketball groups to this test load, which was used before the experiment and at the end of its completion. In particular, before the start of the experiment, the number of goals scored in the CG out of 40 possible shots was 19.8 ± 2.53 times (49.5%), and after - 20.9 ± 2.85 times (52.2%), whereas

in EC these indicators were 18.7 ± 2.44 times (46.8%) and 27.8± 3.29 times (69.5%) - respectively.

The cardiorespiratory reaction to this test load, determined according to heart rate and BH, before the experiment was significant in both groups. Namely: heart rate at rest - before performing the test before the experiment in the CG was 65.4 ± 5.62 bpm, and in the EG - 66.3 ± 5.75 bpm. After completing the test load, these values increased sharply and amounted to 163.7 ± 7.15 bpm, respectively. and 164.2 ± 7.03 bpm.

Respiratory rate indices in both groups before the experiment in the corresponding sequence were: 14.1 ± 2.15 and 14.3 ± 2.11 times / min. -before the test load; 41.7 ± 4.05 and 42.5 ± 4.16 times / min. - after completing the test load.

After the completion of the period of the pedagogical experiment, the pulse response in the CG increased from 68.3 ± 7.78 bpm. up to 155.9 ± 7.65 bpm, while the same indicators in the EG group increased respectively: from 64.2 ± 4.07 bpm / 141.5 ± 7.35 bpm.

Changes in Respiratory rate after the completion of the pedagogical experiment in both groups in the corresponding sequence amounted to: from 15.2 ± 2.27 times / min. up to 43.3 ± 4.59 times / min. and from 12.3 ± 1.72 times / min. up to 38.6 ± 2.87 times / min.

It can be seen that the above indicators of motor and functional tests established by the basketball players of the EG differed in their pronounced progression towards the end of the pedagogical experiment. This dynamics of the indication of the studied indicators, established in this group, shows the high efficiency of the experimental exercises developed by us, which ultimately allowed rebuilding the key functions of the cardiorespiratory system of the body to an economical level of tolerance to applied loads. Moreover, it also led to significant increase in the effectiveness of attacking actions.

It is important to emphasize the fact that such results of a pedagogical experiment found among basketball players of both groups, were reflected in the indicators of the volume and effectiveness of attacking actions with the participation of the corresponding teams in the Championship of Uzbekistan held in the season 2018-2019. The number of analyzed games of each team was 22 matches (table#2).

Table#2: **Indicators of the volume and effectiveness of attacking actions of basketball players from the experimental (team "SC MORU") and control (team "Electroapparat") groups according to participation in the Championship of Uzbekistan season 2018-2019**

No. p.p	**Attacking actions**	**Teams**	
		"SC MORU"	**"Electroapparat"**
		2018-19 season	
1.	Total number of games	22	
2.	Points scored	2004	1690
3.	Attempts of 2 point shots	1102	1066
4.	*-Made*	*634*	*538*
5.	***- Accuracy percentage (%)***	***57.5***	***50.5***

6.	Attempts of 3 point shots	588	498
7.	*-Made*	*176*	*122*
8.	***- Accuracy percentage (%)***	***29.9***	***24.5***
9.	Free Throw Attempts	343	411
10.	*-Made*	*208*	*248*
11.	***- Accuracy percentage (%)***	***60.6***	***60.3***
12.	Total rebounds	1116	1038
13.	*- Offensive rebounds*	*361*	*335*
14.	*- Deffensive rebounds*	*755*	*703*
15.	Assists	571	414
17.	Steals/block shot	340/73	237/37
17.	Turnovers	445	422
18.	Efficiency	2644	1927
19.	Starter score (starting five)	1119	1373
20.	Bench score (substitutes)	885	317
21.	Points in paint (restricted area)	1182	1007
22.	Fast break points	670	520
23.	Second chance points	291	251
24.	Points from turnovers	616	445

The table shows that the total number of points scored in the team "Electroapparat" (CG) amounted to 1690, and in the team "SK MORU" (EG) - 2002 points. The total number of 2 points shots was 1066 and 1102, respectively. Of these scored - 538 (50.5%) and 634 (57.7%). Volume (attempts) of 3 point shots: 498; 588. The number and percentage of shots scored is 122 (24.5%) and 176 (29.9). The number of free throw shots is 411 and 343, the number and percentage of shots scored are 248 (60.3%) and 208 (60.6%). The total rebounds were: 1038 and 1116, offensive rebounds 335 and 361, defensive rebounds 703 and 755. Assists - 414 and 571, - “steals / block shot” - 237/37 and 340/73. Turn overs - 422 and 445. The points scored by the players of the “starting five” are 1373 and 1119 the points scored by the players of the “bench players” are 317 and 885. The number of points scored from the paint area “restricted area” (3 second zone) is 1007 and 1182. Points scored through the “fast break” are 520 and 670. “Second chance” points are 251 and 291, and points scored from turnovers are 445 and 616.

It can be seen that the indicators of the volume and effectiveness of the attacking actions of the basketball players of the EG (team “SK MO RU”) in terms of their participation in the national championship turned out to be much higher and better (in many respects) than the basketball players of the CG (team “Electroapparat”). Such pronounced progressive dynamics of the studied parameters of attacking actions, established in the EG, occurred, in our opinion, due to the systematic use in training mode and after training and competitive loads of this group, complexes of specialized and relaxation-hypoxic exercises. It should be assumed that these exercises, accelerating the process of the current restoration of working capacity and increasing the body’s resistance to oxygen deficiency (O_2), that led not only to the development of anaerobic endurance in these basketball players, but also contributed to an increase in their attacking ability.

CONCLUSION

From the above analysis of research materials, the following fundamentally important conclusions can be formulated:

1. It was revealed that in the practice of training basketball teams of elite level club teams of Uzbekistan in the course of training - purposeful and short-term recovery exercises are almost not used. During practices, passive recovery pauses are mainly used, and after the completion of competitive games, the implementation of procedures for restoration of working capacity is not practiced at all. That is why the regular (traditional) training program does not increase the effectiveness of attacking actions.

2. The experimental exercises program developed by us on the example of basketball players from the EG (the SK MORU team) turned out to be quite effective in terms of accelerating the process of current recovery of motor activity, increasing the athlete body's resistance to oxygen deficiency (O_2) and increasing the effectiveness of attacking actions, which was confirmed by their participation in competitions of the Championship of Uzbekistan.

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