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THE EFFECTS OF VARIOUS RUNNING LOADS ON THE CARDIORESPIRATORY RESPONSE; AND TARGETED ACCURACY OF SHOTS IN CHILDREN 7-8 YEARS OLD PLAYING TABLE TENNIS

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Abstract:This paper examines the effects of various running loads on the cardiorespiratory response and aiming accuracy of strikes in children aged 7-8 years who play table tennis. The aim of the study is to determine the effect of different intensities and durations of running exercises on the functional indices of the cardiovascular and respiratory systems, as well as on the technical and tactical skills of children in table tennis.

Key words:Running loads, cardiorespiratory response, aiming accuracy, physical activity, sports training, endurance, technical and tactical skills.

Relevance and necessity of the topic. Almost all specialists and scientists involved in scientific and methodological support of the process of training table tennis athletes pay priority attention to solving the problems of developing the speed of movements aimed at the effective implementation of attacking and defensive actions during long competitive games, which is associated with highly developed aerobic-anaerobic work ability [G.V. Barchukova, V.M. Bogushus, O.V. Matytsin, 2006, pp. 178-189; G.V. Barchukova, A.N. Mizin, 2015, pp. 49-91; V.V. Komonov, 2014, pp. 29-63; M.D. Volokhova, 2018, pp. 20-46].

At the same time, they believe that the education of such an integral quality should be organized from the earliest stage of a long-term cycle of sports training. However, according to the data of long-term observation of the course of training sessions conducted with groups of initial training, it was established that the associated development of speed of movement and accuracy of blows (including for the timely execution of defensive actions) with the use of situationally simulated exercises. Moreover, it is also known that in table tennis the game takes place in conditions of chronic execution of explosive jumps, leaps, turns, rotations, which are produced along with differently directed accelerations. Such loads, acting primarily on the receptors of the vestibular analyzer, cause the concealment of signs of motion sickness, accompanied by loss of balance and discoordination of aimed movements. Therefore, when developing speed of movement with subsequent processing of the accuracy of aimed actions in young tennis players of groups of initial training, issues of increasing the stability of maintaining static and dynamic balance should be in the center of attention of coaches involved in the preparation of a sports reserve for this sport.

The purpose of the study was to study the effects of different types of running loads on the cardiorespiratory response and targeted accuracy of shots in children 7-8 years old playing table tennis.

Research methodology and organization.

Speed qualities of young tennis players were assessed based on the time of the shuttle run "Yolochka" - 54 m. And running sideways around the tennis table clockwise and counterclockwise twice. Diagnostics of the cardiorespiratory response was made based on the



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heart rate (HR) and respiratory rate (RR). And the assessment of the aiming accuracy of blows was carried out by the results of the following combined test.: a tennis table is installed with its side against the wall; the height of the wall is 45 cm. A circle-target with a diameter of 45 cm is drawn from the middle part of the table surface; the subject, standing at the start at the edge of the table, at the signal within 30 s. makes aimed blows at the target; the total number of blows and the accurate ones are counted. The test is performed "At rest" and against the background of the aftereffect of the shuttle run "Yolochka".

Results of the study and their discussion. The studies conducted within the framework of the put forward question showed that the examined children aged 7-8 years, engaged in table tennis, had a heart rate in a state of relative rest (without load) before the beginning of the educational and training year (ETY) of 76.4 ± 3.18 beats / min., RR - 16.8 ± 2.03 times / min., the total number of aimed strikes 30 sec. - 25.9 ± 2.25 times, of which accurate - 9.3 ± 1.5 times. And by the end of the ETY completion, the heart rate and RR slightly decreased and amounted to 75.1 ± 2.02 beats / min. and 15.3 ± 1.47 times / min., respectively. The total number of aimed strikes decreased by 1.8 times, and of these, the number of accurate strikes decreased by 0.6 times (table1).

Table 1.

Tests/test conditions	Running test results	H S S (bpm)	B D (times/min.)	Strikes in 30 s.	
				volume	accurate
At rest without load	-	$76,4 \pm 3,18 \\ 75,1 \pm 2,02$	$\begin{array}{c} 16,8 \pm 2,03 \\ 15,3 \pm 1,47 \end{array}$	$25,9 \pm 2,29 \\ 27,7 \pm 2,35$	$\begin{array}{c} 9,3 \pm 1,5 \\ 9,9 \pm 1,17 \end{array}$
Разница	-	+1,6	+1,5	-1,8	+0,6
Immediately after "herringbone -54 m"	$23,7 \pm 1,78 \\ 22,3 \pm 1,47$	$\begin{array}{c} 157,8 \pm 4,17 \\ 153,9 \qquad \pm \\ 3,22 \end{array}$	$\begin{array}{c} 45,7\pm 3,79\\ 42,5\pm 3,18\end{array}$	$\begin{array}{c} 14,6\pm 1,78\\ 15,9\pm 1,89\end{array}$	$\begin{array}{c} 2,8 \pm 0,05 \\ 3,9 \pm 0,07 \end{array}$
Difference	+1,4	+3,9	+3,2	-1,3	+1,1
Immediately after running around the tennis table	$31,1 \pm 3,14$ 29,3 ± 2,43	$149,7 \pm 6,13 \\ 145,9 \pm 5,07$	$\begin{array}{c} 43,3 \pm 3,87 \\ 41,6 \pm 3,62 \end{array}$	$11,7 \pm 1,53 \\ 12,5 \pm 1,64$	$\begin{array}{c} 4,2\pm0,7\\ 4,9\pm0,9\end{array}$
Difference	+1,8	+3,8	+1,7	-0,8	+0,7

Effects of various running loads on cardiorespiratory reactions and aiming accuracy of strikes in children aged 7-8 years, playing table tennis. n=36x3=108

Note: - in the denominator – at the beginning of the academic year (UTG); - in the numerator – at the end of the UTG.

Against the background of the aftereffect of the running load "Yolochka" - 54 m., where the average running speed at the beginning of the UTG was 23.7 ± 1.78 sec., the heart rate and respiratory rate increased by more than two times and reached 157.8 ± 4.17 beats / min and 45.7 ± 3.79 times / min., respectively. The total volume of aimed strikes for 30 sec. also decreased by almost two times and amounted to 14.5 ± 1.78 times, and of these, accurate strikes increased by almost three times - 2.8 ± 0.05 times. By the end of the UTG, the average result of running "Yolochka" improved by 1.4 sec. and amounted to 22.3 ± 1.47 sec. At the same time, the heart rate and respiratory rate indicators were characterized by a positive change or decreased to 153.9 ± 3.22 beats/min. and 42.5 ± 3.18 times/min., respectively. The total number of aimed strikes in

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30 s. decreased by 1.3 times or amounted to 15.9 ± 1.89 times, while of these, the number of accurate strikes tended to increase and amounted to 3.9 ± 0.07 times, where the difference was exactly 1.1 times. Immediately after the running load with movement around the tennis table (twice sideways clockwise and counterclockwise) the running speed at the beginning of the UTG was 31.1±3.14 sec., while the heart rate and respiratory rate increased less significantly than the indicators recorded at rest and immediately after the "Christmas tree" run: 149±6.13 beats/min. and 43.3±3.87 times/min., respectively. However, the total number of return strokes decreased significantly and was 11.7 ± 1.53 times, and the accuracy of the strokes "slightly" increased -4.2±0.7 times. By the end of the completion of the UTG, the above indicators were, respectively: 29.3±2.43 sec.; 145.9±5.07 beats/min.; 41.6±3.62 times/min. 12.5±1.64 times; 4.9±0.9 times. It is evident that the indices of coordinative respiratory reactions, obtained at rest without load both before and after completion of UTG, sharply decrease under the influence of running loads and thus indicate extremely insufficiently developed anaerobic endurance "practiced" in the examined young tennis players. Such anaerobic reaction can "seriously" limit not only the quantitative value of the final blows, but can also have an inhibitory effect on the manifestation of the accuracy of the final blows produced during game loads.

Conclusion. The study showed that the 54-meter "Christmas tree" running load significantly affects the cardiorespiratory reactions and the accuracy of strikes in children aged 7-8 years who play table tennis. At the beginning of the UTG (educational training group), there was a sharp increase in the heart rate (HR) and respiratory rate (RR), indicating a high load on the cardiovascular and respiratory systems. The total number of aimed strikes in 30 seconds decreased almost twofold, while the accurate strikes decreased significantly.

By the end of the UTG, the running speed improved, and the HR and RR indicators showed positive changes, indicating some adaptation of the body. However, the total number of aimed strikes continued to decrease, despite a slight increase in accurate strikes.

After the running load with movement around the tennis table, although the running speed and HR and RR indicators were lower, the total number of aimed strikes also significantly decreased, but the accuracy of strikes slightly increased. This points to a complex relationship between physical activity and technical and tactical skills.

Overall, the results highlight the need to develop anaerobic endurance in young tennis players, as insufficient physical preparation may limit both the number and accuracy of shots during game loads. It is recommended to include elements in training programs that contribute to improving anaerobic endurance and coordination, which may have a positive effect on athletic performance.

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