A comparative analysis of young tennis player target accuracy when using balls inflated under different pressures

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Purpose: *make a comparative analysis of the target accuracy of ten-year tennis players in performing test exercises with balls with a pressure of 75% of the standard and balls with standard pressure.*

Material & Methods: *in the study participated 8 tennis players of ten years of age, the group 5 years of training. In the course of the research, the following methods were used: analysis and generalization of literature sources, analysis of documentary materials, testing, method of expert evaluations.*

Results: *replacing balls with a pressure of 75% of the standard for standard leads to a deterioration in the target accuracy of ten-year tennis players, which is a consequence of distortion of the technical characteristics of movements.*

Conclusion: *results of the study indicate the need for correction of the technique of players of this age in the transition from balls with a pressure of 75% from the standard to standard.*

Keywords: *tennis player, the assessment of technology, the target accuracy of the ten-year-old athletes.*

Introduction

Testing technical actions of tennis players is a test of their target accuracy, that is, the accuracy of getting a tennis ball to certain points of the court. Accuracy is a complex quality, maximally manifested in motion, with an appropriate combination of its spatial characteristics. The development of the accuracy of movements is determined by two factors: the level of development of physical qualities and the perfection of control of movements.

V. P. Guba, S. A. Tarpischev, A. B. Samoylov argue that "under the condition of the development of physical qualities, the accuracy of movements can be developed by improving the management of movements, through the improvement of its components, increasing the accuracy of the accuracy of the musculo-articular sensations and motor components, vision (reactions to moving objects, depth of peripheral vision), increasing psychological stability in the accuracy of movement when striking the ball (attention, concentration)" [2].

Raising the question of analyzing the technical preparedness of a young tennis player, it is necessary to take into account the stability of performance by a particular player of certain technical techniques [1; 4].

The main existing methods for determining the target accuracy in tennis and the specific application of each of them are described in the work of D. S. Krylov, L. E. Shesterova [5]. Of the five variants of the assessment methods given in this work, let us dwell on three that give the most objective assessment of the technique of tennis players and determine their target accuracy at the time of testing. This is a technique for determining the International Tennis Number, its detailed description is available on the website ITN [6], technique T. S. Ivanova, a detailed description of the rules of testing is given in the train-

ing manual "Organizational and methodological foundations for the training of young tennis players" [3], and the technique proposed by D. S. Krylov [5]. To assess the technical preparedness of players of different ages, the most commonly used method of determining the International Tennis Number [6], but a comparative analysis of testing techniques and the target accuracy of ten-year tennis players in the transition from balls with a pressure of 75% from the standard to the standard, either by this or by other methods was not carried out.

The purpose of the research

make a comparative analysis of the target accuracy of ten-year tennis players in performing test exercises with balls with a pressure of 75% of the standard and balls with standard pressure.

Material and Methods of the research

The studies were conducted on the basis of Kharkiv tennis club "SportKort". The study involved eight tennis players of ten years of age, the fifth year of training. To obtain a reliable result of changes in the target accuracy of tennis players of 10 years of age, testing was carried out according to the methods proposed by ITF, T. S. Ivanova and D. S. Krylov. Testing was conducted for one day, in two stages, with sufficient rest breaks between performing exercises. At the first stage of the study, the exercises were performed with balls with a pressure of 75% of the standard, on the second – with standard balls. In the testing involved sparring, who has a high level of preparedness in tennis.

In the course of the research, the following *methods* were used: analysis and generalization of literature sources, analysis of documentary materials, testing and method of expert evaluations.

Results of the research and their discussion

The first stage of testing was carried out with balls with a pressure of 75% of the standard. The results of the evaluation of the technique of one of the players using the ITN method are presented in Fig. 1.

Fig. 1. Table of assessing the technique of the player by method ITN

The table (figure 1) shows an assessment of the performance of 10 strikes on the right and left in the given court zone along the line (the left column of the Table). In column 2 of the table, estimates are given for 8 strokes in a given direction.

Column 3 presents an estimate of 12 hits to the right and left from a rebound along the court's diagonal. Column 4 – the results of 12 serve, in the presence of a second feed, into different parts of each of the feed squares.

The maximum number of points for passing the test (8 points) can be obtained if the ball hits the far court zone and rebounds it into the bonus zone. Zero points the player receives when the ball hits the net or outside the single court.

Detailed instructions for calculating points and the method itself are given in the ITF website [6]. Figure 2 shows the marking of the court areas for evaluating the strikes to the right and left along the line and to assess the strikes of the rally.

The results of the mobility test are shown in the bottom lines of the table in Figure 1.

Evaluation of the technique and target accuracy of young tennis players, taking into account the recommendations of ITF, was conducted by experts – qualified tennis coaches.

The total number of points received by this player, when performing technical elements is 166, an additional 26 points were awarded for mobility. In total, the player scored 192 points, which corresponds to ITN No. 7 for female players. The maximum possible value of ITN is ITN No. 1, the minimum – ITN No. 10. Thus, the better the technical preparedness and the target accuracy of the player, the lower his ITN number.

After the completion of testing using the ITF methodology, the group moved to testing according to the methodology of
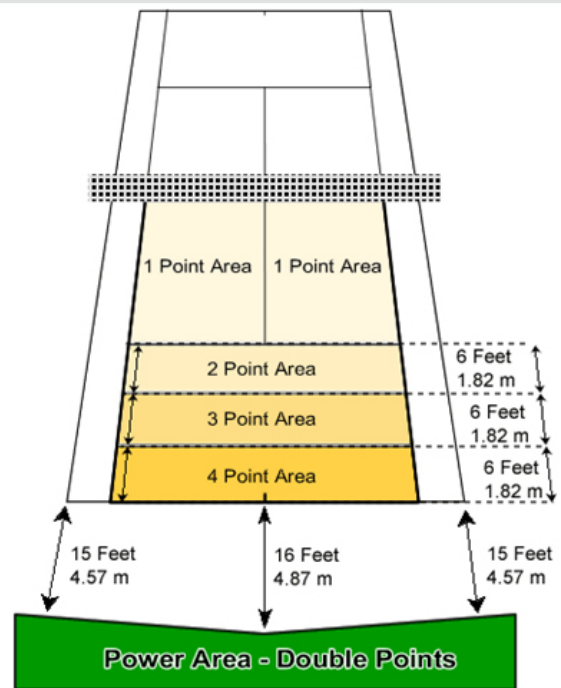

Fig. 2. Marking courts to test the ITN (for strikes with the rebound and rally on line) [6]

T. S. Ivanova. The results of testing balls with a pressure of 75% of the standard one of ten years tennis players by the variant of evaluation described by T. S. Ivanova are shown in the Table 1.

The Table shows the scores of one of the tennis players for each of the tested technical elements, exhibited by experts taking into account the target accuracy of the athlete. The last line of the Table shows the average score received by the athlete for technical readiness. It is the arithmetic mean of the estimates for each completed element. The method is described in detail in the training manual "Organizational and methodological foundations for the training of young tennis players" [2]. So, for 15 hits in the court on the diagonal, an estimate of 5, when hit 10–14 times – an estimate of 4 and so forth.

The results of testing the technical preparedness of one of the athletes according to the method proposed by D. S. Krylov, when using balls with a pressure of 75% of the standard, are presented in the Table 2.

Table 2
Evaluation of the technique of the athlete by the method D. S. Krylov

Technique elements	Player's ratings	
	Balls with a pressure of 75% of the standard	Standard balls
Right with a rebound	5	4
Left with a rebound	4	3
Right volley	4	4
Left volley	4	3
Serve	4	3
Smash	4	4
Average rating for the complex	4,17±0,28	3,5±0,5

A distinctive feature of this technique is that testing is conducted without a sparring partner who performs the return of balls, i. e., first, there is no error in the sparring game, and secondly, there is no need to search for it, which allows the trainer to conduct testing more often and, accordingly, to determine the target accuracy of the athletes and see its dynamics. The evaluation system is described in detail in the article by D. S. Krylov, L. E. Shesterova "Evaluation of the technique of ten-year tennis players" [4].

After testing with balls with a pressure of 75% of the standard, the group rested for 15 minutes. After the rest was a 10-minute warm-up with standard balls. Then the tennis players were tested on the three methods described above with standard balls.

To compare the results of technical preparedness and target accuracy of young athletes when using balls with different pressures, a Table 3 was filled.

It recorded the results obtained by each of the 8 players with balls with a pressure of 75% of the standard and standard balls in testing for each of the three methods.

The data in Table 4 indicate a decrease in ITN per unit in the first test of seven tennis players in the study group. Player No. 7 retains the ITN value, but there is a decrease in the estimate for the target accuracy.

Significant changes are observed in assessments of the technique of athletes by other methods. So, the target accuracy of tennis players with standard pressure ball by T. S. Ivanova technique is 0,6–1,1 points lower than when testing them with balls with a pressure of 75% of the standard. Assessments of young athletes for the target accuracy by D. S. Krylov technique also decreased within the limits of 0,67–1,17 points. Visually, when using standard balls, experts observed the inaccuracy of the ball hit the center of the racket, the delay of the swing to rebound the ball from the court, an insufficiently accurate accompaniment of the ball with a racket and other errors, which lead to loss of target accuracy, acquired using balls with a pressure of 75% of the standard.

For a more directional correction of the technique of a specific player, it is necessary to conduct a detailed analysis of the technique of performing each of the control exercises given above.

Table 3
Comparative evaluation of players' technique according to the used methods

Player number	ITN balls with a pressure of 75% of the standard	ITN with standard balls	Delta ITN	Evaluation by Ivanova technique with balls with a pressure of 75% of the standard	Evaluation by Ivanova technique with standard balls	Delta by by Ivanova technique	Evaluation by Krylov technique with balls with a pressure of 75% of the standard	Evaluation by I Krylov technique with standard balls	Delta by by Krylov technique
1	6	7	1	4.3	3.4	0.9	4.17	3.5	0.67
2	6	7	1	4.6	3.5	1.1	4.17	3.16	1.01
3	6	7	1	4.1	3.4	0.7	4.33	3.16	1.17
4	6	7	1	4.4	3.3	1.1	4.5	3.5	1
5	6	7	1	4.2	3.6	0.6	4.33	3.66	0.67
6	6	7	1	4.5	3.5	1	4	3.16	0.84
7	7	7	0	4.1	3.2	0.9	4.33	3.16	1.17
8	6	7	1	4.2	3.3	0.9	4.17	3.5	0.67

Conclusions

Comparative analysis of the technical preparedness of young tennis players when using balls with a pressure of 75% of the standard and standard showed a decrease in target accuracy, which is associated with a distortion of the technique of performing control exercises. The results of the research indicate the need to correct the technique of players of this age in the transition from balls with a pressure of 75% of the standard to standard.

Prospects for further research. Based on the use of computer technology and the method of expert assessments, determine the direction of correction of the technique of ten-year tennis players.

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