THE ASSESSMENT OF THE ATTACK FINALIZED WITH TOPSPIN - RETOPSPIN IN FEMALE JUNIOR TABLE TENNIS

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Abstract

In current table tennis, the attack is the main source of winning the points in the sets, the topspin and retopspin technical-tactical procedures being responsible not only for initiation and counterattack, but also for finishing, being ubiquitous in the technical expression of both offensive and defensive players. The assessment of these attack elements is an objective way of highlighting the progress made by the sportswomen while preparing for the competition calendar, the used tests being able to reflect the level of consolidation achieved in the execution of the two strikes. Goal: Establishing a set of tests for the technical / tactical assessment and for evaluating the movement capabilities specific to the attack completed with topspin and retopspin. Hypothesis: Knowing the level of consolidation of the topspin- retopspin attack, we will be able to check the appropriateness of the methodological strategies applied to make efficient the attack finalized this way. Objectives: to verify the appropriateness of using certain tests in the assessment of topspin and retopsin in this age group.

Keywords: table tennis, female juniors, attack, topspin, retopspin

1. Introduction

Together with the serve, topspin and retopspin are the most used technical-tactical elements in actual table tennis for both male and female players, according to Negulescu, C., I, Mocanu, M., Cristea, F., (2018),
over 50% of the interviewed specialists consider the topspin as the most prolific technical tactical element, and almost 80% of them, as the most used element in the attack, the contemporaneousness and importance of developing and using the topspin and re-topspin in the attack phase becoming a mandatory task for performance in female juniors. We consider it to be an optimal period for evaluating the attack completed with topspin-retopspin, taking into account, according to Dobos, Ș, (2009, p.33), that the female junior category II is the period when the technical, tactical and physical elements are formed, as well as personality traits; the first aspects of individualization appear during this period, based on the skills manifested for a certain game profile; when finishing this stage, the athlete must have a well-shaped game profile.

As there are no well-established assessment tests specific to table tennis in attack both from the technical and tactical point of view and from the movement capabilities point of view, this has determined us to check the opportunity of adopting such tests in order to objectively identify the progress made by the young female athletes who play performance table tennis. The importance of the evaluation of the attack completed with topspin and retopspin is supported by the importance of these elements in the technical-tactical background specific to the attack. Topspin's counteraction, ranked with 60% in winning the point (Negulescu I., et al., 2018) put in the game through the retopspin, can be an action with visible influences on the scoreboard, but also on the financial, image prolificacy and on the results obtained at important competitions, the high aggressiveness of the strike, the quality of the response to topspin due to the speed and effect combination favoring the success.
We have adopted 2 tests to assess the specific movement capabilities and five to assess the level of topspin-retopspin consolidation.

2. Methods

The research was performed on a group of 20 female table tennis players, all right hand players, their ranks ranging from 8th to 133th place in female juniors II category (out of which two players are part of the national team) and one female junior I which is part of the national team at her age category.

They were divided into two samples, one experimental and the other control sample, 10 subjects each, which constituted the object of the test; the strategies for the efficiency of the attack completed with topspin and retopspin are applied only in the experiment group.

For the choice of tests, the specific movement capabilities (coordination and speed capabilities) were taken into account, for which reason the *Toss Wall Test* was chosen to assess the level of co-ordination of the visual analyzer with the upper limbs and *Naveta* performed through running with step added for the speed of the specific movement.

Multiball - training, Butterfly, Topspin - forehand Retopspin and backhand Topspin –Retopspin were selected in the technical-tactical area. An IBM SPSS vers.23 computerized program was used for statistical and mathematical interpretation and a Windows 10 program was used for graphics and editing.

The test for the evaluation of the coordinate capacities in speed conditions (the coordination of the visual analyzer with the upper limbs) is called the *Toss Wall Test* and is done using a field tennis ball that will be thrown from one hand and caught after ricocheting from the wall with the other hand, without touching the floor, from a distance of 2 m from a wall, in a 30 second time interval. The maximum number of correct executions will be recorded.

Naveta test was used to highlight the movement speed level, using for its execution the movement with added step, due to its specificity in relation to this sports discipline. For putting this test to practice, we used two table tennis boards of 73 cm in height and 200 meters in length, placed at 3 meters from each other, the performer having to make the movement with added step between the two points at maximum speed and to reach with the palm of the right hand the board towards which she moves, recording the time required for 6 such executed actions.

Each female athlete performed the test twice, at an interval of 1 minute of pause between them.

-Butterfly

Within this technical-tactical test, using topspin and retopspin, one of the female performers will send the ball only diagonally to the tennis table, first time by hitting with the forehand and then with the backhand.

The assessment was made by using a number of 5 balls, recording the number of exchanges (performances) for each ball played. The same goes for the level of in line execution of the two procedures.

- Diagonal topspin and forehand retopspin

It is done from the serve without imprinting effects to the ball, the takeover being done with topspin and its takeover with forehand retopspin, continuing with the last mentioned procedure until the end of the ball exchange. 5 balls are made available to the female players, being recorded the number of successful executions after each completed exchange.

- Diagonal backhand topspin and retopspin

It is done from the serve without imprinting effects to the ball, the takeover being done with backhand topspin and its takeover with backhand retopspin, continuing with the last mentioned procedure until the end of the ball exchange. 5 balls are made available to the female players, being recorded the number of successful executions after each completed exchange.

-Multiball topspin and retopspin

This test aims to evaluate the forehand and backhand topspin from the ball with backspin effect and the retopspin performed with forehand and backhand from the corresponding areas, respectively from forehand and backhand.

Each series involves the use of four balls and ten such series, taking into account only the series in which all four strikes were correct (they did not stop in the net and they did not exceed the play area, going out of the tennis table).

3. Results and Discussions

Following to the methodological strategies for making efficient the attack finalized with topspin-retopspin and to the interpretation of the data obtained from the performed tests, the values had been recorded; these values we will present in the form of the following graphs and tables.

Table no. 1-Average values achieved by the Experimental Group during the technical – tactical and specific movement capabilities testing at the Initial Testing

TESTS	Minim	Maxim	Average	Standard Deviations
TOOS WALL TEST REPETITIONS	17	26	21.50	3.240
NAVETA /SECONDS	6.72	8.67	7.529	.52221
TOP.+RETOP. DIAG.FHD. EXECUTIONS	14.0	30.0	21.40	5.1897
TOP.+RETOP. DIAG.REV. EXECUTIONS	5.0	49.0	16.50	15.7709
BUTTERFLY DIAGONAL EXECUTIONS	5.0	18.0	10.20	3.9665
BUTTERFLY LINIE EXECUTIONS	4.0	21.0	9.80	5.0288
MULTIBALL TOP.RETOP. EXECUTIONS	0	6	1.90	1.853

Table no. 2– Average values achieved by the Control Group at the technical – tactical and specific movement capabilities testing at the Initial Testing

TESTS	Minim	Maxim	Average	Standard Deviations
TOOS WALL TEST REPETITIONS	20	27	24.40	2.757
DEPLASARI LATERALE SECONDS	5.86	8.00	6.924	0.76286
TOP.+RETOP. DIAG.FHD. EXECUTIONS	3	20	10.80	6.052
TOP.+RETOP. DIAG.REV. EXECUTIONS	7	25	16.50	6.964
BUTTERFLY DIAGONAL EXECUTIONS	9	22	15.00	4.989
BUTTERFLY LINIE EXECUTIONS	6	21	12.00	5.375
MULTIBALL TOP.RETOP. EXECUTIONS	0	5	2.30	1.767

Table no. 3-Average values achieved by the Experimental Group during the technical – tactical and specific movement capabilities testing at the Final Testing

TESTS	Minimum	Maximum	Average	Standard deviation
TOOS WALL TEST REPETITIONS	20	28	24.40	2.716
NAVETA/DEPLASARI LATERALE SECONDS	6.43	7.63	6.819	.35234
TOP.+RETOP. DIAG.FHD. EXECUTIONS	16	34	24.20	5.692
TOP.+RETOP. DIAG.REV. EXECUTIONS	6	53	18.40	16.681
BUTTERFLY DIAGONAL EXECUTIONS	6	20	11.60	4.115
BUTTERFLY LINIE EXECUTIONS	5	23	11.00	5.395
MULTIBALL TOP.RETOP. EXECUTIONS	0	7	2.60	2.011

Table no. 4-Average values achieved by the Experimental Group during the technical – tactical and specific movement capabilities testing at the Final Testing

TESTS	Minim	Maxim	Average	Standard deviation
TOOS WALL TEST REPETITIONS	21	29	25.80	3.048
DEPLASARI LATERALE SECONDS	5.85	7.45	6.665	0.61911
TOP.+RETOP. DIAG.FHD. EXECUTIONS	3	20	11.60	6.222
TOP.+RETOP. DIAG.REV. EXECUTIONS	8	26	17.40	6.720
BUTTERFLY DIAGONAL EXECUTIONS	10	23	15.60	4.624
BUTTERFLY LINIE EXECUTIONS	7	22	12.60	5.481
MULTIBALL TOP.RETOP. EXECUTIONS	0	5	2.60	1.647

Table no.5 - Results registered at *Toss Wall* Testing
Descriptive Statistics, TOSS WALL TEST- no. of repetitions

	N	Average	Standard deviation	Standard error	95% confidence interval for the average		Minimum	Maximum
					Lower limit	Upper limit		
Experimental group Initial testing	10	21.50	3.240	1.025	19.18	23.82	17	26
Experimental group Final testing	10	24.40	2.716	0.859	22.46	26.34	20	28
Control group Initial testing	10	24.40	2.757	0.872	22.43	26.37	20	27
Control group Final testing	10	25.80	3.048	0.964	23.62	27.98	21	29
Total	40	24.03	3.246	0.513	22.99	25.06	17	29

Table no. 6 – The result of ANOVA test for *Toss Wall* Test
NAVETA- seconds

	Sum of squares	df	Dispersion	F	p
Between groups	98.075	3	32.692	3.761	0.019
Within groups	312.900	36	8.692		

Total	410.975	39			

ANOVA Table contains the result of the test: F = 3.761 and p = 0.019 < α= 0.05, which means that the average values of the variable differ between them significantly for at least two of the studied groups.

Table no.7 - *Naveta* Testing
Descriptive Statistics, *NAVETA- seconds*

	N	Average	Standard deviation	Standard error	95% confidence interval for the average		Minimum	Maximum
					Lower limit	Lower limit		
Experimental group Initial testing	10	7.5290	0.52221	0.1651	7.1554	7.9026	6.72	8.67
Experimental group Final testing	10	6.8190	0.35234	0.1114	6.5670	7.0710	6.43	7.63
Control group Initial testing	10	6.9240	0.76286	0.2412	6.3783	7.4697	5.86	8.00
Control group Final testing	10	6.6650	0.61911	0.1957	6.2221	7.1079	5.85	7.45
Total	40	6.9843	0.65153	0.1030	6.7759	7.1926	5.85	8.67

Table no. 8- The result of ANOVA test for *Naveta* Test, NAVETA- seconds

	Sum of squares	df	Dispersion	F	p
Between groups	4.296	3	1.432	4.205	0.012
Within groups	12.259	36	0.341		
Total	16.555	39			

ANOVA Table contains the result of the test: F = 4.205 and p = 0.012 < α= 0.05, which means that the average values of the variable differ between them significantly for at least two of the studied groups.

Table no.9 – Results of Diagonal Topsin- Forehand Retopspin Testing

Diagonal Topspin - Forehand Retopspin					
Experimental Group			Control Group		
Initial testing	Final testing	Difference	Initial testing	Final testing	Difference
21.4	24.2	2.8	10.8	11.6	0.8

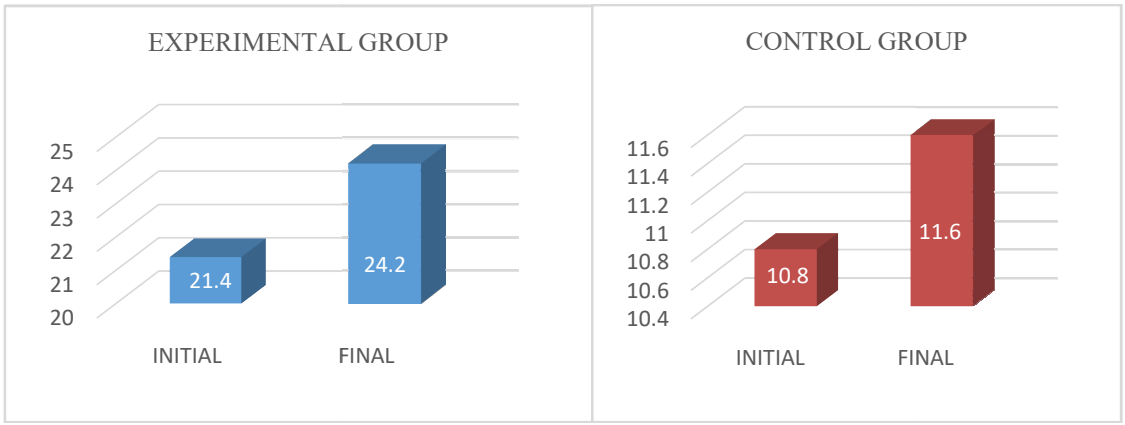

Figure no. 1 - *Diagonal Topspin – Forehand Retopspin* Testing for the experimental and control group (comparison between the initial and final evolution level)

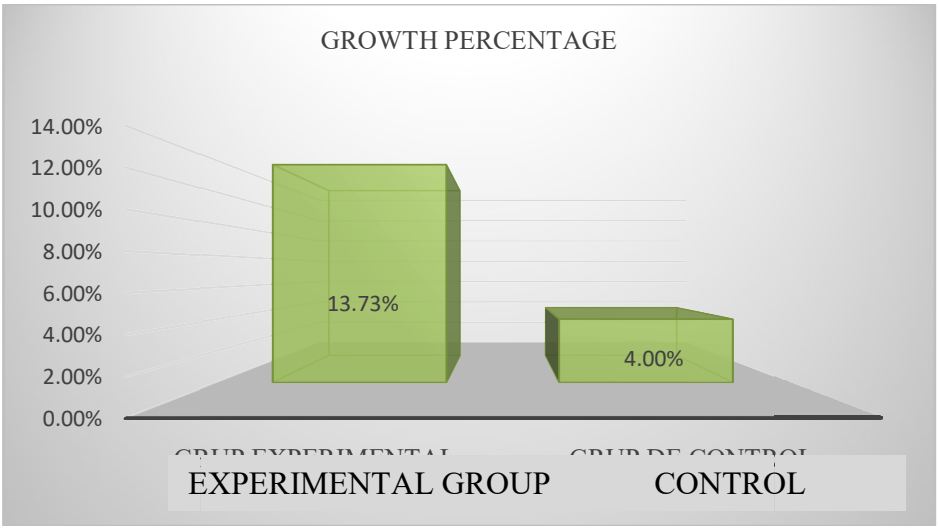

Figure no. 2 - Butterfly final testing for the experimental and control group (comparison between the initial and final evolution level)

Table no. 10 – *Multiball Testing*

Multiball - no. of executions					
Experimental Group			*Control Group*		
Initial testing	Final testing	Difference	Initial testing	Final testing	Difference
1.9	2.6	0.7	2.3	2.6	0.3

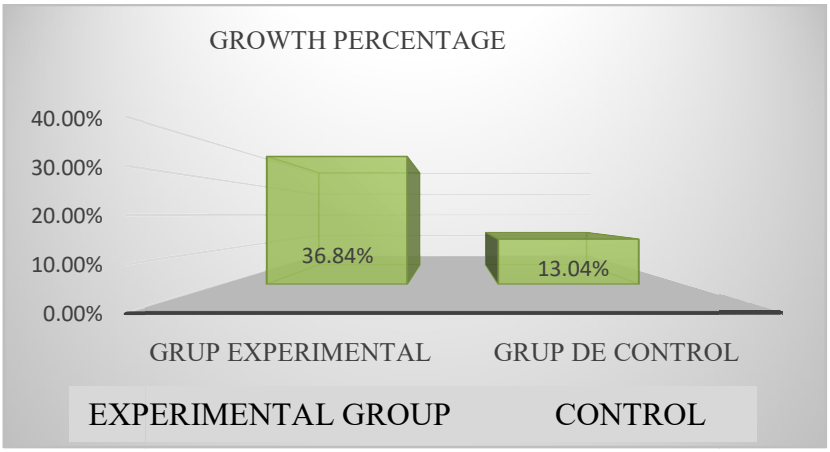

Figure no. 3 - *Multiball* Testing (comparison between the initial and final evolution level)

The use of the tests reveals the following differences between the two groups as a result of the methodological strategies used:

- Educating the coordination between the visual analyzer and the upper limbs has a better progression of 7.75% following to the sports training program implemented in the experimental group as compared to the control group, aspect highlighted by the Toss Wall Test;
- An improvement in the specific movement speed, higher with almost 6 percent in favor of the experimental group, is observed, as a result of the technical-tactical and physical training program for making the attack more efficient;
- As a result of the *Diagonal Topspin- Forehand Retopspin* test, it is recorded a progress with 13.08% higher than the initial test and with 5.67% higher for the female juniors from the experimental group, as compared to the control group, for the retopspin procedure, resulting from the preparation aimed at making more efficient the attack finalized with this strike.
- The *Diagonal Backhand Topspin-Retopspin* test performed by the two groups versus the initial test time becomes more efficient in the experimental group with a favorable percentage of 6.07% as an increase in efficiency over that of the experimental group and with 11.52 % relative to initial testing.
- The *Diagonal Butterfly* test performed by the two groups versus the initial testing time with a nearly 10% increase in the technical-tactical expression of the combined retopsin on both sides; the experimental group is placed before the control group

- The comparative growth percentage achieved by the two groups compared to the initial test time with the *Multiball Test* reveals a substantial increase in the combination of forehand and backhand topspin from the ball with effect of backspin, with the retopspin strike, with a 23% difference in favor of the group under our research, progress made as a result of the means, methods, design and planning of the adopted training. From the values of the comparative percentage progress report to the final testing between the two groups, there is an effectiveness of the attack completed by topspin and retopsin in the experimental group, which leads us to conclude that the attack can be improved by adopting methodological strategies directed to this purpose in this age category.
- The value of the Anova test indicates the differences between the two groups, the values recorded by the experimental group reflecting the efficiency of the movement capabilities specific to this sport discipline, with a beneficial influence on the attack finalized with topspin-retopspin in female juniors as a result of the applied methodological strategies.

4. Conclusions

The use of tests to assess the specific movement capabilities and the effectiveness of the attack finalized with topspin and retopspin is one of the methodological strategies that can influence the female juniors' performance in table tennis.

The comparative data obtained from the initial and final testing in the control and experimental group validated both the increase in the efficiency of topspin and retopspin in the attack and the opportunity to use these tests to measure the progress in the technical-tactical and specific movement skills expression.

In case the female juniors have the same value in conditions of adversity at the play table during official competitions, the effectiveness of the attack finalized with topspin and retopspin can make a difference in favor of the female player who has benefited from such a program developed on technical-tactical component and on specific movement capabilities.

This category of female cadets is appropriate for making topspin and retopspin attack more efficient, but also for educating the movement skills specific to this discipline, constituted by speed and coordinating capabilities that will be beneficial to the female juniors' performance capacity.

We recommend to the coaches involved in performance in this age group to use the tests applied in our research as a means of assessing both the level of attack expression and the movement capabilities related to the specific movement speed and the coordination of the visual analyzer with the upper limbs, as they can constitute an objective tool for measuring and analyzing the methodological strategy applied in preparing the female juniors, but also a means of guiding their training in order to achieve the desired performance objectives.

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