Resaarch in Kinesiology
2014, Vol. 42, No. 2, pp.168 -172

STUDY OF THE BALL SPEED DURING FOREHAND AND BACKHAND HIT IN TENNIS TRAINING OF 12 YEARS OLD PLAYERS

(Research note)

Milen Chalakov
National Sports Academy "Vassil Levski",Sofia, Bulgaria

Abstract

The purpose of this study is to analyze the ball speed during the implementation of the major strikes in tennis (forehand and backhand) and to obtain information on the level of utilization of both impact and efficiency of 12 years old players after one year education and training work. Participants in the study were 15 boys and 15 girls, aged 12. At the beginning and in the end of macro cycle (1 year) each competitor was measured for speed and the accuracy of the hits for forehand and backhand was determined. Every athlete played 25 balls for each of the two strokes. Speed radar was used to measure speed of hits.

Keywords: *boys, girls, major strikes in tennis, (Speed check - personal Radar), motor testing, motor skills, sports training.*

INTRODUCTION

Management of sports training is a highly complex process requiring continuous monitoring of the achieved level of tennis players motor skills and habits development and constant searching for methods and tools for its optimization (Dimov (Димов) & Zaharieva (Захариева), 2005).

The results of the Steinhofel & Beachus (1999); Weinberg (1988) suggest that early childhood best enhances the implementation and realization of the spatial characteristics of movements, temporal strength and optimal interaction between different factors providing sustainable utilization and development of the movement. All factors thus depend on the individual psychomotor performance of the children. It requires purposeful work for adequate adaptation of the training for every single child during the training process.

According to Dimov (Димов), 2000, the aim of the tennis sports training is to prepare highly qualified players. He describes the specific tasks as follows:

-Building of high moral and volitional qualities;

-Comprehensive physical development enhancing the health. It includes a wide range of physical qualities necessary to improve the specialized motor skills;

-Learning of the technique, tactics and strategy in order to meet the latest trends in contemporary tennis competitions;

-Educating in a wide range of psychological qualities necessary for successfultraining and participation in competitions;

-Acquiring thorough knowledge and skills nee-ded for scientific construction, management and implementation of sports training including cooperation of the coaches, researchers and doctors.

In the process of training these tasks acquire clarity and specificity and should always be discussed and integrated.

Sports training for 12 year old players is based on the indicators for consistency and accuracy. Persistence is associated with a stable learning technique to perform strokes. Accuracy is the control of the forehand and backhand hits completed in the opponent's field (Afework, 2012).

The purpose of this study is to analyze the ball speed during the implementation of major strikes in tennis (forehand and backhand) and to obtain information on the level of utilization of both impact and efficiency of 12 years old players after one year education and training work.

METHODS

Participants in the study were 15 boys and 15 girls, aged 12. At the beginning and in the end of macro cycle (1 year) each competitor was measured for speed and the accuracy of the hits for forehand and backhand was

determined. Every athlete played 25 balls for each of the two strokes. Speed check - personal Radar was used to measure speed of hits.The speed of the accurate shots was measured in kilometers per hour (km/h).

RESULTS

Velocity is a quantitative measure, depending on the phases and proper implementation of the shot, proper body staging, the swing of the racquet and the right hit of the ball. Top players achieve average ball speeds of about 130 km/h. The highest speed measured so far is 199 km/h reached by Andy Murray in 2011 of the Us Open (Willis, 2011). Mean rates of the individuals achieved in our study varied between 85 to 110 km/h and were found relatively good for their age.

Minimum values in boys (76 and 82 km/h) and the girls (75 and 78 km/h) can be ignored and considered random because they are single and could be associated with false hits. Lower speeds direct the coach to the wrong completion of the technique.

Research and testing of the ball speed flying over the net is an important task in the training process. Higher speed shortens the time and the opportunities of the opponent to make retour and contribute to the opponents' mistakes.

Table 1 shows the results obtained during the testing.

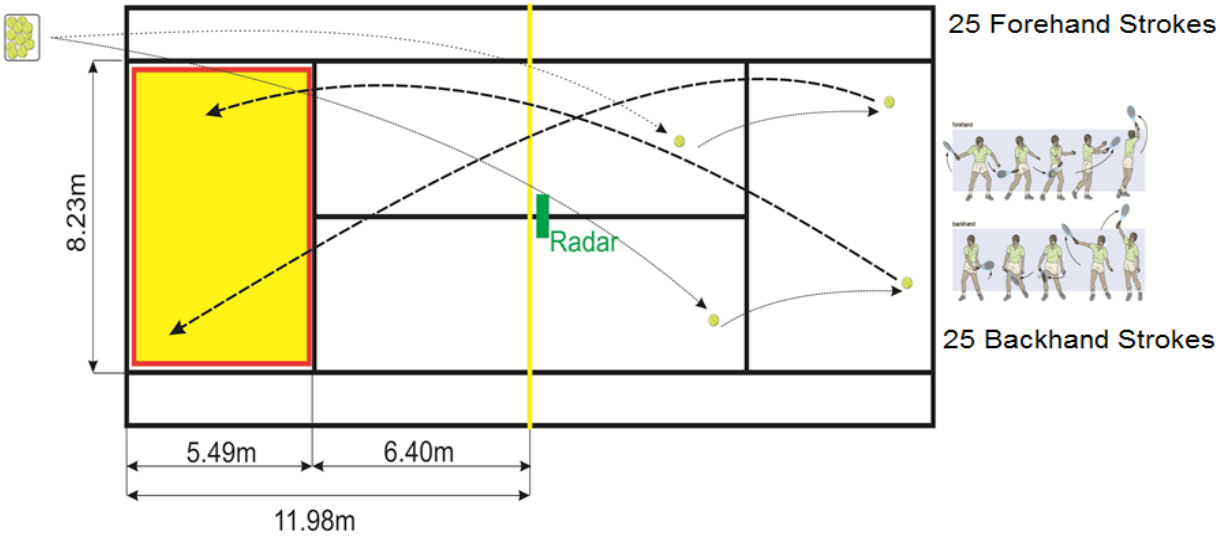

Table 1. The results of the initial and final testing.

Number of testing persons	Boys				Girls			
	Initial testing		Final testing		Initial testing		Final testing	
	F	B	F	B	F	B	F	B
1	100	88	115	90	86	85	98	90
2	105	78	115	95	85	84	96	97
3	82	76	100	93	90	87	97	88
4	95	80	105	92	99	88	102	89
5	90	90	100	97	90	85	99	97
6	101	99	120	102	96	83	104	98
7	98	97	102	101	88	84	98	88
8	95	94	104	103	75	85	90	86
9	99	98	105	102	78	86	97	89
10	100	97	121	101	84	88	97	90
11	99	96	105	99	93	85	104	92
12	100	95	106	102	91	87	101	96
13	101	96	116	101	99	81	105	99
14	105	97	111	102	91	82	98	90
15	100	99	125	105	90	85	99	91
V av.	98	92	110	99	89	85	99	92

The table shows ‑mean values of the speed of all shots for every tested person.

The table shows that the average growth rate between the first and the second study are not very big - from 7 to 12 km / h. To obtain more information on this test, the results will be illustrated by presenting special graphics.

Graphics show clearly the growth of each tested person between the two testing. At the same time we can compare the improvement of the execution of the two beats. (Chart 1 to 4).

The total growth of the boys performing forehand was 12 km / h and it gives information about the overall state of the group (Chart 1).

Players № 1, 3, 6, 10, 13 and 15 are considerably higher than the total growth, while others are with average or with small personal growth.

The return stroke has total increase of 7 km/h, and is significantly different from the other result. The subjects who achieved good results in forehand, show moderate and low growth in backhand (Chart 2). Here we emphasize the results of players № 2, 3, 4, 8 and 12.

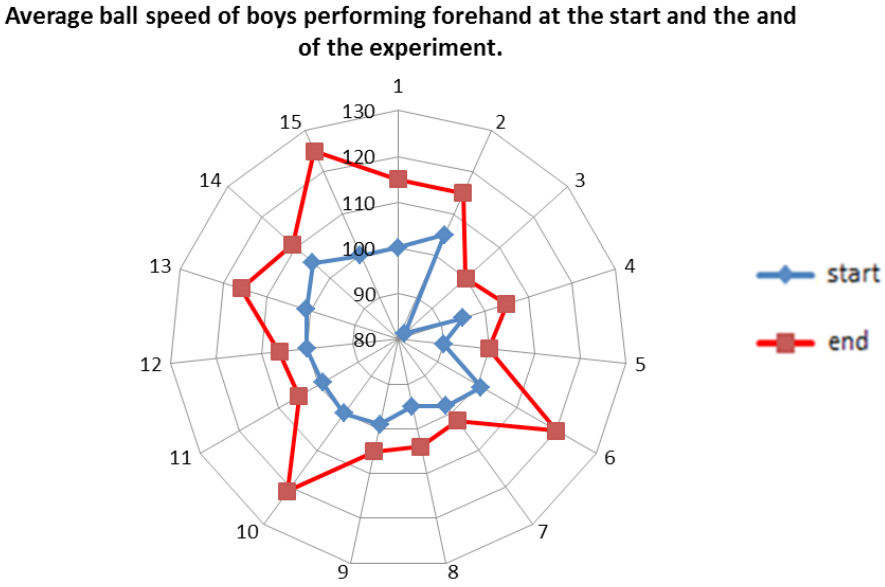

Chart 1

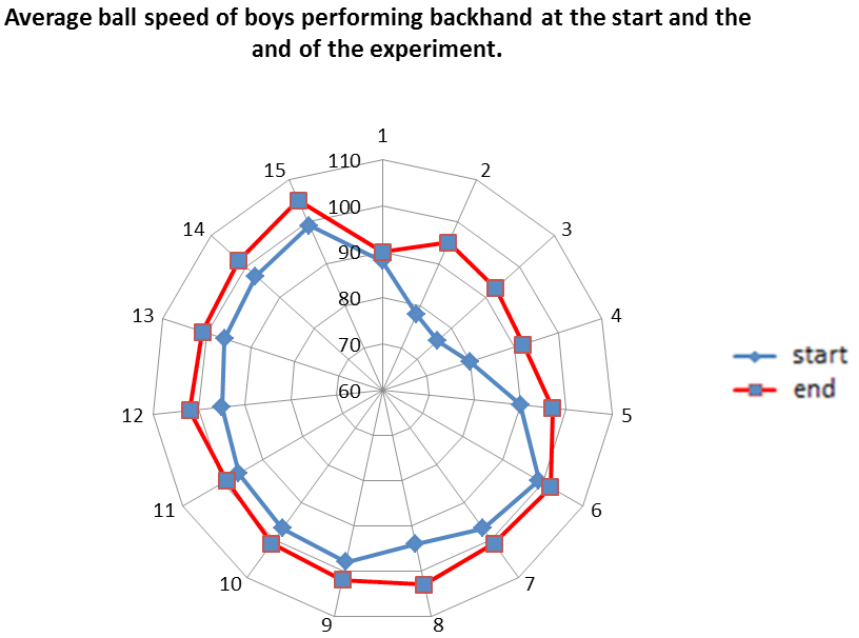

Chart 2

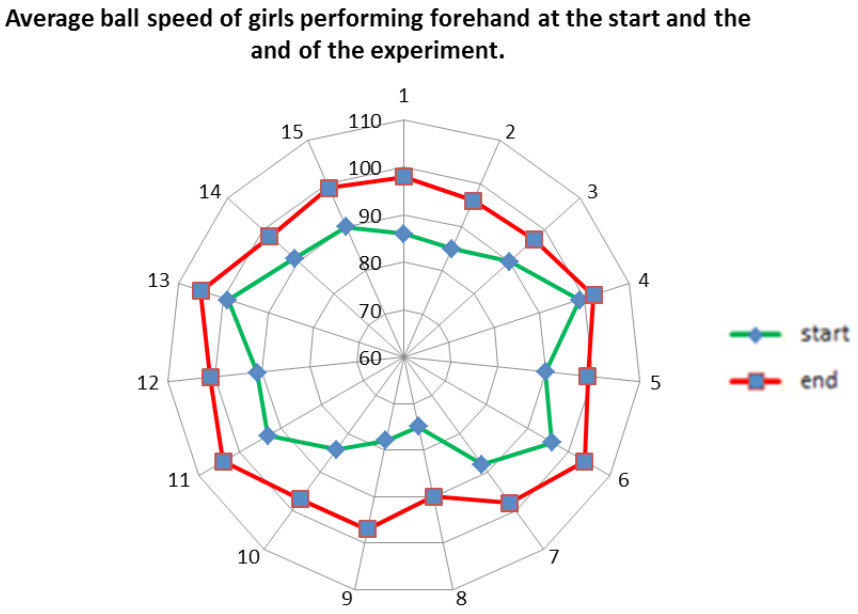

Chart 3

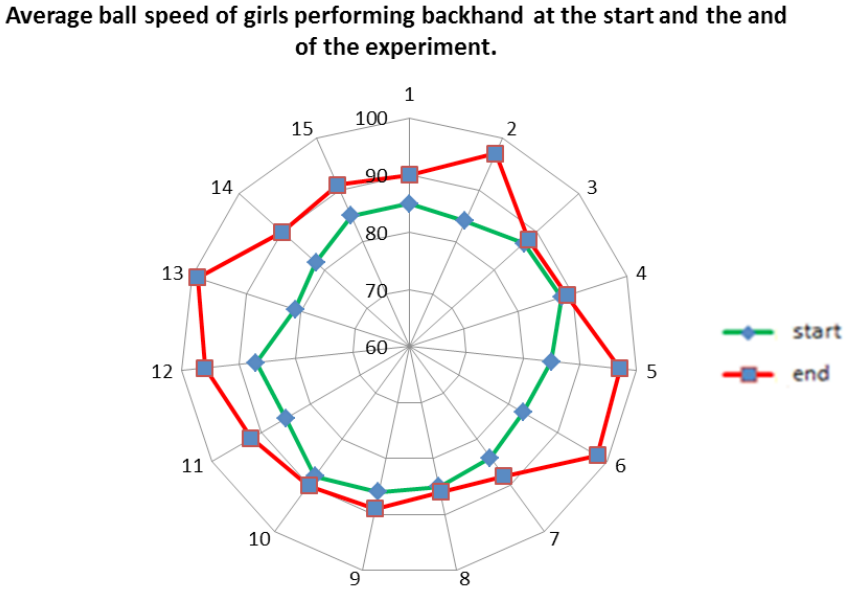

Chart 4

Tennis player № 3, despite lower values recorded at the beginning of the study shows significant growth in both hits in the end.

In girls performing forehand, the total average increase is 10 km/h. They have a larger group with above-average growth. These are players №1, 2, 3, 7,8,9,10,11 and 12 who show ≥ 10 km/h growth (Chart 3).

In the group of girls performing backhand (with average growth of group 7 km / h), one could distinguish tennis players № 2, 5, 6,7,13 and 14. It is also interesting to look at the results of players № 2 and 7. They achieved consistent growth in both analyzed strokes (Chart 4).

CONCLUSION

Proper learning of the two major strokes in tennis (the correct technique of execution) gives significant advantage to each player. Well performed strokes with proper technique are often the key factor in winning

the game. Proper performance of each stroke leads to the increase of its speed. Strokes implemented with the right techniques and high speed can cause error even in the best players.Thus working with 12 years old children requires starting with the correct learning of the technique and afterwards working to for the increase its speed.

When these factors are properly applied, researched two strokes in tennis become the most powerful weapon of each player.

REFERENCES

Afework, H. (2012). *Principles for Developing top Junior Tennis Players.* London: International Tennis Federation.

Braden, V & Bruns, B. (1977) *Tennis for the future. Sports Illustrated Book.* Boston: Little, Brown and Company.

Crespo, M. & Igueras, H. (2001) *World class tennis technique*. Champaign, IL: Human kinetics.

Димов, И., Захариева, Цв. (2005). Спортно - педагогически контрол върху нивото на техническа подготвеност на подрастващи 8 – 10 годишни тенисисти. [Sports-pedagogical control of the technical preparedness level of 8 to 10 year old tennis players. In Bulgarian.] *Сборник, Личност, Мотивация, Спорт,* 10 (стр. 240-249). София: НСА – Прес.

Димов, И. (2000). *Методика на физическата подготовка в тениса.* [Methodics of physical preparation in tennis. In Bulgarian.] София: Софтех.

Elliott, B., Reid, M., & Crespo, M. (2003). *Biomechanics of advanced tennis.* London: International Tennis Federation.

Elliott, B., Marsh, T. & Overheu, P. (1989) A biomechanical comparison of the multisegment and single unit topspin forehand drives in tennis. *Int. J. Sport Biom.,* 5, 350-364.

Groppel, J. (1992). *High tech tennis.* Champaign, IL: Leisure Press

Matikova, T.S. (2012). Means and methods of technical tennis training – beginners' education. *Activities in physical education and sport, 2*(2), 225-227.

Matikova, T.S. (2013). Methodological guidelines for the initial training in techniques and tactics of tennis. *Activities in physical education and sport, 3*(1), 132-134.

Momchilova, A. (2012). Communication skills of the teachers – factor for effective training in tennis in the hours of sports games. *Research in Kinesiology, 40*(1), 3-8.

Pecore, L. (1979). A cinematographic analysis of the one-handed backhand drive as used by skilled and unskilled performers. *Proceedings of "National Symposium on the Racquet Sports"* (pp. 420-476). Champaign, IL: University of Illinois Press.

Steinhofel, L., & Beachus, J. (1998). Training Exercises for Competitive Tennis. Aachen Meyer und Meyer.

Weinberg, R. The mental Advantage: Developing Your Psychological Skills in Tennis. Champaign, IL: Leisure Press, 1988.

Willis, A., (2011). Andy Murray defeats Mardy Fish to reach final of Western & Southern Open in Cincinnati. The Telegraph Media Group Limited.

Correspondence
Milen Nikolaev Chalakov
NSA "Vasil Levski"
E-mail: M.Chalukov @ gmail.com
Studentski Grad, 1700 Sofia, Bulgaria