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DIFFERENCES IN FOREHAND AND BACKHAND PERFORMANCE IN YOUNG TENNIS PLAYERS

Key words: tennis test, age categories, forehand, backhand, boys, girls.

ABSTRACT

The aim of the present study was to assess the performance of tennis groundstrokes by young tennis players of both sexes, aged 12 to 15 years. The sample comprised 60 tennis players (boys and girls) aged 13.61 (± 1.48) years, with the average game experience of 3.78 (± 1.80) years. The players' performance was measured using two parameters, i.e. accuracy and score, during forehand and backhand drive tests. The assessment of test reliability was statistically significant ($r > 0.83$). The statistical analysis of the results used a two-way ANOVA and revealed statistically significant differences in the performance in all three age groups (12-13, 13-14, 14-15 year-olds). Also, statistically significant differences were found between the forehand and backhand shots ($p < 0.001$). However, the players' sex had a non-significant influence on scoring points. The study results do not indicate any differences in tennis performance between the sexes of the age groups in question after completion of a valid test. The differences in boys' and girls' competitiveness are not assessed through a simple test but through a more complex procedure and are evident only during game participation and ranking. Conversely, the difference in performance at the age of 12-15 years as well as the prevalence of one strike (fh) over the other (bh), are both statistically significant. It is not players' sex but their age and the prevalence of the forehand over the backhand performance which determine and differentiate training curricula for young tennis players aged 12-15 years.

INTRODUCTION

The backhand (bh) and the forehand (fh) are the two basic groundstrokes in tennis. Both are accomplished by activation of complex sequences of muscle activity, which incorporate smooth coordination patterns of the trunk and the lower extremities [20]. However, differences exist in learning as well as in muscle activity between the strokes [2, 3, 4, 15].

The control and assessment of factors affecting athletic performance are closely related to the training procedure. The impact of the training procedure should be cross-checked and the results must be used in an appropriate way, or they can even entirely revise the designation and application of the training procedure in compliance with the set goals.

Control is collecting information on the way one or more factors affecting the athletes' performance appear as well as its comparison with the

desired or scheduled situation [1]. The most important kinds of control – excluding the sport result, which is the most efficient and widespread kind – is game observation and the athletic-kinetic test [12].

The use of game observation is accomplished during competition or training. Through observation of game behaviour the assessment of techniques, tactics, as well as psychological and physical factors can be achieved. The athletic-kinetic test is a procedure of diagnosis of the performance level and prediction of processing efficiency [19].

Most athletic-kinetic tests are used to control the occurrence of technical dexterities or physical abilities. The latter are distinguished in laboratory tests and tests in the natural environment. They aim to glean information on the abilities or the progress performed by athletes in a given sport.

On the one hand, the test results can yield significant information on the efficiency of applied training methods. On the other hand, they can help develop different kinetic abilities with regard to athletes' age, sex, stability as well as possible prediction standards for complex abilities [13, 8].

The assessment of performance through tests has been of great interest to tennis researchers, although there is still lack of specialist bibliography and research results concerning the factors influencing tennis performance. The importance of performance stability was highlighted in Mueller-Krieger [16]. The aim of the present study is to examine the backhand and forehand performance of young tennis players (boys and girls) using one test.

METHODS

Sample

The sample consisted of sixty tennis players (30 boys and 30 girls) aged 12-15 years (13.61 ± 1.48), with the average training experience of 3.78 (± 1.80) years. All participants had competitive experience in local or regional tournaments (average 1.78 ± 1.54 years). Their training schedule comprised training sessions three times per week.

Measurements

The players' performance was tested and assessed with the use of a forehand drive and

backhand drive test designed by Wiebe [22]. The test credibility was > 0.88 and test validity $r = 0.71$. The court was divided into graded zones as shown in Fig. 1.

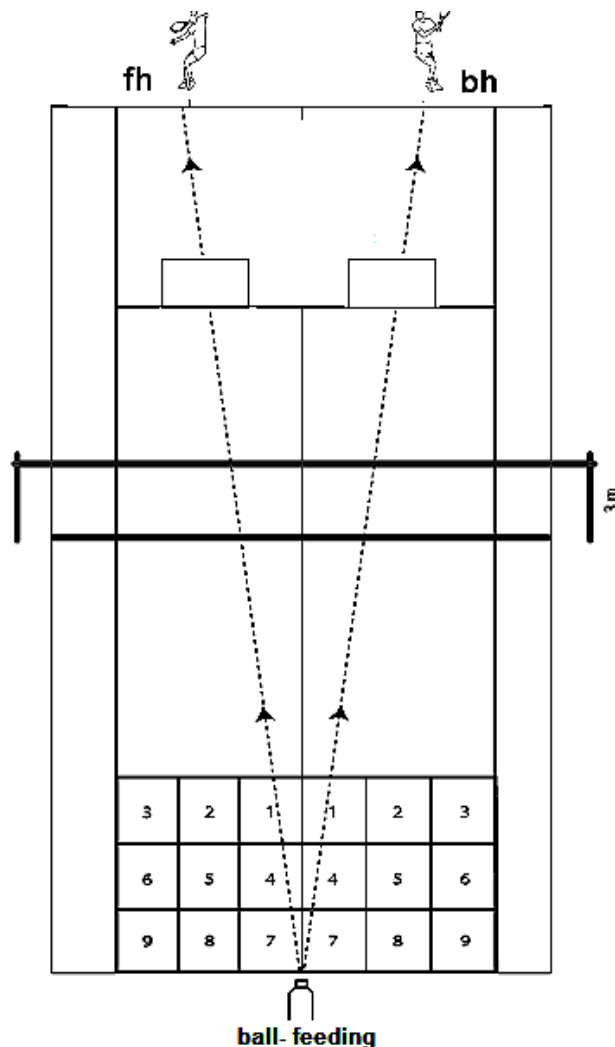


Figure 1. Evaluation of forehand and backhand in the present study, following Wiebe (1980)

During the test each player stood behind the base line and struck the ball sent from the coach from the base line on the other side of the court. The players aimed at a specific target on the opposite court so as to achieve the highest score. Each participant performed ten forehand and ten backhand attempts. Each stroke was graded from 0 to 9 points, according to the area where the ball landed, while the balls going over the rope, those which stopped at the net or landed out of the zones, were given 0 points. If a player failed to hit the ball at the start of the attempt, the stroke was considered

played and received 0 points. The balls which touched the net and were valid were repeated.

The test score was drawn based on two parameters:

- the sum of points received after ten forehand and backhand attempts;
- the sum of successful strokes at the attempts described above when the ball landed in the graded zones.

Before the measurements, the subjects were informed that during the next two training sessions they would be participating in a programme aiming to assess their tennis abilities. They were asked to attend their sessions as normal and stick to their regular training schedules. In order to create appropriate conditions, attract participants' interest and increase their eagerness to participate as well as levels of stimulation and readiness we followed the recommendations provided by Murray & Janelle [17] which had already been successfully applied [18, 23].

The procedure was completed in two measurements: the first measurement was followed with three prescheduled training sessions a week, after which the second measurement took place.

The first measurement did not involve any trials in order to get familiar with the dexterity. The participants performed a regular warm up before each training unit. Then each participant performed ten consecutive forehand strokes and ten consecutive backhand strokes, steadily fed by the same experienced coach from a specific point on the opposite court.

The second measurement was carried out to check the credibility of the first measurement. When the experimental procedure was completed, the participants were informed about the initial scope of the measurements and the procedure in general.

The statistical analysis of the results used a two-way ANOVA. Statistically significant differences in the performance in all three age groups (12-13, 13-14, 14-15 years) were noted.

RESULTS

The reliability of measurements was statistically significant ($r > 0.83$). The results showed that the sum of results for both strokes (fh & bh) revealed statistical significant differences in performance between the three age groups

($p < 0.001$). There was no statistically significant difference between boys and girls, although girls achieved better scores in all age groups. (Fig. 2). Fig. 3 shows the two strokes (fh & bh) measured separately. In all age groups the forehand performance level was higher ($p < 0.001$) than the backhand performance level, when the scores and efficiency were evaluated.

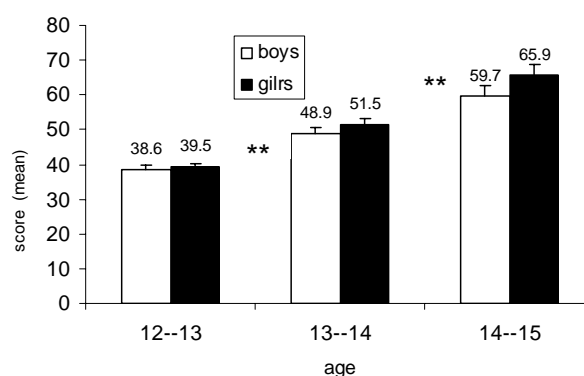


Figure 2. Score analysis of results for both strokes (forehand and backhand) for boys and girls in three different age groups

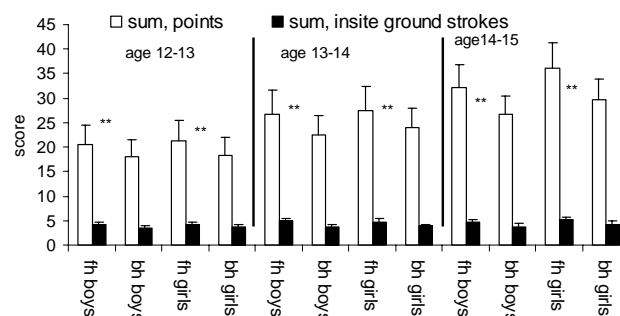


Figure 3. Score analysis for forehand and backhand strokes for boys and girls in three age groups

DISCUSSION

Among players in the aforementioned age groups as well as in high performance players a difference between backhand over forehand efficiency can be found as justified by Knudson and Bahamonde [11]. It has been reported that elite tennis players also differ in racket acceleration and angular velocity between their forehand and backhand performance levels. The speed of the strokes and the time required to learn them are key points in

learning the technique [9]. Moreover, Eason and Smith [6] suggested that learning the forehand stroke, in contrast to the backhand, might interfere with learning the backhand stroke. Furthermore, the speed in the forehand stroke depends not only on the player's grip but also on the acceleration of the shoulder, arm, forearm and wrist [7].

The present study attempted to assess the performance of the forehand and backhand strokes by young tennis players by means of a kinetic test as well as the differentiation in their athletic performance at a given age. There seems to be no differences in performance between subjects of different sex in the age group 12-15 years. On the contrary, the difference in performance and the prevalence of the forehand over the backhand strokes are equally important, which is not the case of ball velocity among elite tennis players [14].

Inversely, other authors have noted that it is more difficult for novice players to perform the correct movements of the trunk and the arm in the backhand as compared to the forehand. These uncoordinated movements lead tennis players to adopt uncomfortable positions, which can then ultimately contribute to the development of a poor technique [10]. Recent findings indicate a significant difference in backswing among players moving the racket behind the hitting shoulder in both strokes [5].

Differences in compatibility between sexes are not observed during a simple test, but through a more complex procedure and only through games and ranking. During the tennis game, the players' psychology, tactics as well as the presence of the opponent are known to be of great importance [16, 17, 21]. The test can assess differences mostly in the stroke technique, agility and efficiency. Thus, through the application of a credibility test differences in performance of players aged 12-15 years, as well as the prevalence of one stroke (fh) over the other (bh) were observed. The results of these tests can provide important information as to the efficiency of training methods, and help in improving the learning standards and developing different kinetic abilities based on players' age and sex, their stability and prospects for coordinated abilities [8, 13]. As a result, tennis players and trainers will be able to design appropriate protocols and more efficient tests, and then assess performance with the use of a specific test in order to improve attribution.

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