THE COMPARISON OF REACTION TIME OF MALE TENNIS PLAYERS, TABLE TENNIS PLAYERS AND THE ONES WHO DON'T EXERCISE AT ALL İN 10 TO 12 AGE GROUPS

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ABSTRACT

The purpose of this study was to compare reaction time of male tennis players, table tennis players and the ones who don't exercise at all in 10 to 12 age groups. The sample of the study totally 51 healthy person - including 17 tennis players, 18 table tennis players and same age 16 sedentary male - (average age 11,99±0,81 years; mean body height 150,76±7,73 cm; mean body mass 42,20±8,35 kg; training experience 3,7±1,2 years) participated in this study voluntarily. The subjects were informed about tests and underwent anthropometric measurements followed by the visual and auditory reaction time test with Power 2000 New Test/Finland. One Way ANOVA test were used to assess differences between the groups of mean reaction time against the light and sound in SPSS version 15,0 and the level of statistical significance was set at p<0,05. The Scheffe Post Hoc test was applied to make a pairwise comparison between the different levels of within subjects' factors in groups. The results demonstrated that significant differences were found table tennis players responses with tennis players and sedentary group in average reaction time results (p<0,05).
Key Words: Tennis, Table Tennis, Reaction Time, Sound, Light

10-12 YAŞ GRUBUNDAKİ ERKEK TENİSÇİLER, MASA TENİSÇİLER VE AYNI YAŞ GRUBUNDAKİ SEDANTERLERİN REAKSİYON ZAMANLARININ KARŞILAŞTIRILMASI

ÖZET

Bu çalışma, 10-12 yaş grubu erkek tenis, masa tenisi sporcusu ve spor yapmayan bireylerin reaksiyon zamanlarının karşılaştırılması amacıyla yapılmıştır. Araştırmaya ortalama yaşı 11,99±0,81 yıl, ortalama boy uzunluğu 150,76±7,73 cm, ortalama vücut ağırlığı 42,20±8,35 kg, antrenman yaşı 3,7±1,2 yıl olan 17 tenis oyuncusu, 18 masa tenisi oyuncusu ve 16 spor yapmayan birey olmak üzere toplam 51 sağlıklı birey gönüllü katılmıştır. Katılımcılar testler hakkında bilgilendirilmiş ve boy, vücut ağırlığı ölçümü sonrasında görsel ve işitsel reaksiyon zamanları Power 2000 New Test/Finland ölçüm aracı ile ölçülmüştür. Gruplar arasında ortalama reaksiyon zamanı değerlerindeki farkın belirlenmesi için SPSS 15,0 paket programında p<0,05 istatistiksel anlamlılık düzeyinde Tek Yönlü Varyans Analizi (ANOVA) testi, gruplar arasında fark çıkması durumunda ise çoklu karşılaştırma (Scheffe Post Hoc) testi kullanılmıştır. Sonuç olarak, masa tenisi sporcularının ortalama reaksiyon zamanı değerleri ile tenis sporcularının ve spor yapmayan bireylerin reaksiyon zamanı değerleri arasında anlamlı farklılık bulunmuştur (p<0,05).
Anahtar Kelimeler: Tenis, Masa Tenisi, Reaksiyon Zamanı, Ses, Işık

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INTRODUCTION

Reaction time has a long history as a popular measure of human motor skill performance and it has been associated with motor performance. Sports scientists and coaches were mostly interested in the areas that correspond the need of human potential and sport performance (1,2,3). The most remarkable studies on physical education and sport especially racket sports suggested that sport and exercise contribution decreases the reaction times (4,5,6,7). Racket sports such as tennis, table tennis and badminton require a combination of physiological requirements like speed, resistance, strength, motor coordination, short-term maximal or submaximal efforts, game based techniques and strategies. These demands make the racket sports particularly challenging for athletes at different levels such as professional, amateur and beginner (8,9). With the technical, tactical and training sides of the game, some other sides consisting of physical features, quick reflex and rhythmic movements have rendered the game a dynamic sport. In the trainings and major competitions sports scientists and coaches are constantly reluctant over the adoptions of decreasing reaction time for players. Process of adaptation has been very important to determine the some specific features and parameters developing the performance of tennis players as well as racket games. In the literature review it has been understood that many recent studies (10,11,12,13,14) investigated reaction times from several aspects and also plentiful studies have been investigated in different age groups and categories reaction time with the related to age (8,10,15,16,17,18), sex (10,18,19,20,21), level of sport (3,7,8,10,11,12,22,23), visual and auditory (7,18,19,20,21,22,23,24). In addition to these, the physiological demands of players have been tried to determine by the sports scientists and researchers in the trainings, games and examinations. As a result of literature review, relatively small number of research studies in this area limits the scientific information about game specific demands, physiological profiles, and comparing of reaction time of racket sports players and non-players against the light and sound. In this study, it has been aimed to compare reaction time of male tennis players, table tennis players and same age sedentary against the visual and auditory.

MATERIAL AND METHOD

Participants and Protocol

The sample of the study totally 51 healthy person - including 17 tennis players, 18 table tennis players and same age 16 sedentary male - (mean age 11,99±0,81 years; mean body height 150,76±7,73 cm; mean body mass 42,20±8,35 kg; training experience 3,7±1,2 years) participated in this study voluntarily. The athletes were informed about the aim of study and they also were wanted to fill the volunteer participation form and each measurement was familiarized to them before the test.

Anthropometric Measurements

Height and Weight Measurement: The height of players was measured by Seca, Germany to the nearest ±0,01mm and body weight was also measured by Tefal, USA.

Reaction Time Test: Power 2000 New Test/Finland simple visual and auditory reaction time test was applied to the subjects to determine the right and left hand reaction time against the light and sound. They tried the test five times and the all score was recorded. After removal minimal and maximal values, arithmetical mean was taken for the rest of values.

Statistical Analysis: All data are reported as means and standard deviations. Before using the parametric tests, the assumption of normality was verified using the Shapiro-Wilks test. A one-way repeated-measures analysis of variance (ANOVA) test were used to assess differences between the groups of mean reaction time. The Scheffe Post Hoc test was applied to make a pairwise comparison between the different levels of within subjects' factors in groups. The level of statistical significance was set at p<0,05 in SPSS version 15,0. Effect sizes (η^2) were also calculated for mean reaction time.

RESULTS

Table 1. The Anthropometric Features of Participants

	Tennis (n=17)	Table tennis (n=18)	Sedentary (n=16)	Total (n=51)
	Mean±sd	Mean±sd	Mean±sd	Mean±sd
Age (year)	11,77±,83	12,28 ±,75	11,94±,85	11,99±0,81
Training Age	4,35±1,50	3,22±,55	-	3,77±1,24
Height (cm)	149,82±8,48	150,78±8,16	151,69±6,68	150,76±7,73
Weight (kg)	41,64±7,18	42,29±9,63	42,69±8,25	42,20±8,35
BMI (m^2/kg)	19,27±2,00	19,00±2,86	18,41±2,34	18,89±2,40

There were no significant differences among anthropometric features of all group participants (p>0,05).

Table 2. The Comparison of Right and Left Hand Reaction Time of Participants Against The Light

	Tennis (n=17)	Table tennis (n=18)	Sedentary (n=16)	p	η^2
	Mean±sd	Mean±sd	Mean±sd		
Right-Hand (msec)	267,76±32,43	241,72±21,15	266,38±25,34	,008*	,997
Left-Hand (msec)	273,12±39,24	262,89±43,10	291,13±37,44	,130	,995

*p<0,05

In the comparison of right and left hand reaction time of participants against the light, there were significant differences among the right-hand reaction times of groups (p=,008).

Table 3. The Comparison of Scheffe Post Hoc Test Scores of Right-Hand Reaction Time of Participants Against The Light

	x	p
Table tennis - Tennis	26,042	**0,021***
Table tennis - Sedentary	24,653	**0,034***
Tennis - Sedentary	1,390	0,989

*p<0,05

As a result of scheffe post hoc test, the reaction time values of table tennis players significant difference against the light (p<0,05). Because of the fact that table tennis players had lower reaction responses than the other groups.

Table 4. The Comparison of Right and Left Hand Reaction Time of Participants Against The Sound

	Tennis (n=17)	Table tennis (n=18)	Sedentary (n=16)	p	η^2
	Mean±sd	Mean±sd	Mean±sd		
Right-Hand (msec)	218,59±40,11	200,44±35,35	224,25±26,08	,117	,104
Left-Hand (msec)	239,35±43,87	204,11±30,77	231,75±21,11	**,008***	,990

*p<0,05

In the comparison of right and left hand reaction time of participants against the sound, there were significant differences among the left-hand reaction times (p=,008).

Table 5. The Comparison of Scheffe Post Hoc Test Scores of Left-Hand Reaction Time of Participants Against The Sound

	x	p
Table tennis - Tennis	35,242	**0,012***
Table tennis - Sedentary	27,639	0,065
Tennis - Sedentary	7,603	0,809

*p<0,05

As a result of scheffe post hoc test, the reaction time values of table tennis players significant difference against the light (p<0,05). Because of the fact that table tennis players had lower reaction responses than the tennis players and sedentary group.

DISCUSSION

Racket sports, like tennis and badminton, which consist quick reflex, rhythmic technical and tactical movements are dynamic sports. These sport branches have in common a rapid succession of mostly short-term maximal or sub-maximal efforts and short recovery phases. There have been a lot of studies in the literature aimed at determining of the physical features and reaction time of tennis badminton players and the sedentary participants (3,10,13,17,21,25,26,27,28). Besides, some other studies have conducted to compare the relationship between the activity of upper extremity muscle group and reaction time against visual and auditory (11,12,21,24,29). It has been very important to determine the some specific features and parameters for developing the performance of tennis and badminton players with same age sedentary. There have been few direct attempts to compare of reaction time of male tennis and table tennis players. Therefore, this study aimed to compare of reaction time of male tennis players, table tennis players and same age sedentary participants against the visual and auditory.

There were no significant differences among anthropometric features of all group participants (Table 1). In the comparisons, it can be seen that sedentary group was taller, had lower body mass index than tennis and table tennis players (Table 1). Güçlüöver et al.

(29) found significant differences among height, body fat percentage and fat free mass values between youth elite and amateur badminton players. Kafkas et al. (11) found significant differences in body fat percentage values between national and amateur players. In some studies in order to determine the body composition of badminton players Revan et al. (25) found that the body fat percentages of elite Turkish and foreign national team badminton players were %10,9 and 11,2 respectively. When this study was compared to the other studies in the literature, the findings about anthropometric features of players have showed similarity with study of Kafkas (11). Literature review has showed that beginning age of sport, level of sport and the requirements of sport have significantly affected to individual physical development in the same age group (11,12,25,29).

In this study, the right-hand reaction times were compared among groups against the light, there were significant differences among groups (p=,008). However, there was no significant difference in left-hand reaction time values (p=,130) (Table 2). As a result of post hoc test scores, it was possible to say that the right-hand reaction time values of table tennis players were better than the others in this study. This could be because of the fact that the demands of table tennis sport were different and players used to act quickly in training and matches. Furthermore, because of the

fact that table tennis players and tennis players were faster than sedentary group, it can be understood that the physical activity and sport based training led to significant changes in contraction of muscle and reaction time. The right-hand reaction times were compared among groups against the sound, there was no significant difference among groups (p=,117). However, there were significant differences in left-hand reaction time values (p=,008) (Table 4). As a result of post hoc test scores, it was possible to say that the left-hand reaction time values of table tennis players were the fastest group in this study. Kafkas et al. (11) stated that there was significant difference between right and left hand reaction time of national and amateur badminton players against the sound. In similar study, there was no significant difference between the values of sound reaction time of 14-16 aged tennis and volleyball players (respectively, 222,51±48,47, 190,54±36,17 sec.) (24). In a study by Arslanoğlu (23) found that average reaction time of right and left hand were 197,91±33,14 msec. against the sound in 12 elite men badminton athletes. In a study by Kafkas (11), there were significant differences between the values of right and left hand reaction time of national and amateur badminton players against the light (respectively, 0,24±0,31, 0,25±0,32sec.). Günay et al. (24) showed that there was no significant difference in visual reaction time of 14-16 aged of tennis and volleyball players (respectively, 238,69±30,08, 251,34±48,53 msec). In another similar study. Arslanoğlu et al. (23) found that reaction time of right-hand was 212,91±25,92 msec. against the light, and also found the left-hand reaction time was 225,33±33,49 msec. in 12 elite men badminton athletes. When this study was compared to the other studies in the literature, the findings about reaction time values of players have

showed similarity with the other studies (12,21,23).

Ability of players to quickly and accurately perceive relevant information facilitate making decision and allow more time for preparation and organization of motor behaviour. In addition to this, exercises especially require anaerobic movements have influenced on reducing the visual and auditory reaction time values positively (4,5,6,7). There have been many studies in the literature supported that reaction time especially simple reaction can be improved with regular training (21,30,31,32). After 12 week basic tennis training, there were statistically significant differences between pre-test and post-test visual reaction times in 8-10 years girls against the light (21). There were found significant differences between physically active and sedentary 8-13 aged participants against visual and auditory reaction time values (28). In another similar study, Ölçücü et al. (32) found significant differences between pre-test and post-test visual and auditory reaction time values in 10-12 years tennis player girls, after 12 week movement training with ball and without ball. When the findings of this study were compared to studies in the literature, it was possible to say that the reaction time values are similar with other studies in the literature and this specific feature can be improved with regular training.

As a conclusion, it could be seen that table tennis players were faster than tennis players and sedentary group in this study. As is seen in the literature studies, beginning age of sport, level of sport, training (frequency and volume), and the requirements of sport, have been very important role in individual physical development in the same age group athletes and children.

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