

# Changes in Body Composition of Students after 16 Weeks Tennis Training

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**Abstract**—Body composition in 15 healthy students in which participated the 4th Henan university Tennis championships was determined with bioelectrical impedance (BI) method. After 16 weeks training, Results showed that their body composition was improved significantly: reduce their body mass, body fat content, increase lean body mass, muscle mass, Basal metabolism, and promote the development of physical health.

**Keywords**—Body composition; Tennistraining; Exercise and health

## I INTRODUCTION

Body Composition refers to is organism Fatty tissue and the non-Fatty tissue's content and the percentage which occupies in the body weight[1].The human body is mainly consisted of water、protein、fat、soluble mineral salts, it's a measure of individual health and an important indicator of the standard figure, and it can monitors the nutritional status of 、fluid balance and the evaluation of growth and development. Most scientific researches indicated that regular physical exercise can improve body composition, reach its ideal result.But In the 21st century, students' physical health is not optimistic. Bodymass and body fat was increased with age, exercise ability impaired and physical fitness declined with age in 18 to 23 years old students[2]. Chinese college the girls students obesity rate 1.21 times are boys, girls hidden obesity 2.24 times boys[3]. Tennis is a good sport, it has many merits that Moderate-intensity、easy to learn、without restriction to court, the mass sports activities based on a better fashion, and it can cultivate students will、feelings, healthy, is a sport loved by the students. There lack deepen systematized stud about tennis training on sedentary students. the present study mainly to explore 16 weeks of exercise training on tennis body composition of university students,and to help students to establish a correct concept of body shape, improve exercise awareness.

## II SUBJECTS AND METHODS

### A. Subjects

15 volunteers served as control subjects that attended the 4th Henan university Tennis championships in HeNan province, in china. And male student 9, female student 6 All subjects were in good health as assessed by medical history, physical examination, hematologic and urine analysis. The anthropometric laboratory characteristics of the subjects are summarized inTable 1.

TABLE 1 ANTHROPOMETRIC VARIABLES IN THE SUBJECTS

sex	number	age/year	height/cm
weight/kg			
male	9	21.8±1.0	176.5±4.4
			69.6±6.1
female	6	21.2±0.8	164.7±3.7
			58.5±5.8

### B. Methods

1) *tennis training*. Experimental protocol carries on 16 week, 4 hour the tennis training each day, 5 day each week. The training content includes: The warming-up 15 minutes, base part 90 minutes, relaxes and cool down 15 minutes.

2) *Body composition* measurement. All subjects were assessed by bioimpedance analysis (BIA) at before training and after training. BIA was performed with Korea H7-ioi353 body composition tester. bioimpedance analysis (BIA) on body mass, BMI, fat mass, lean body mass and basal metabolic rate. Before test, should avoid strenuous activity, wearing the same light clothing, body composition test by test requirements.

3) *Statistical analysis*. All data are presented as M±SD. Analyses were performed by usingSpss software 11.0. the test parameter as follows tables.

TABLE 2 BODY COMPOSITION PARAMETER DURING TRAINING PROTOCOL, PAIRED T TEST (FEMALE) (M±SD)

parameter	N	Before training	after training
Body mass (kg)	6	58.66±5.89	55.91±5.17 * *
Fat mass (kg)	6	15.87±2.47	12.22±2.69 * *
LBW (kg)	6	42.82±2.85	45.54±3.68 *
muscle (kg)	6	40.58±2.77	41.29±2.68 *
BMI	6	21.63±1.62	20.47±1.72 * *
BMR (Kcal)	6	1278±26	1308±42 *

\* were considered statistically significant. (P<0.05) , \* \* were considered statistically significantly. (P<0.01)

TABLE 3 BODY COMPOSITION INDEX TRAINING, PAIRED T TEST (MALE)

parameter	N	Before training	after training
Body mass (kg)	9	70.68±5.24	68.68±4.35 *
Fat mass (kg)	9	12.74±5.19	10.34±3.98
LBW (kg)	9	59.37±2.57	60.43±4.96
muscle (kg)	9	55.57±4.38	56.58±3.34
BMI	9	24.18±2.30	20.71±1.78 * *
BMR (Kcal)	9	1594±59	1573±51 *

\* considered statistically significant.(P&lt;0.05),

\* \* were considered statistically significantly. (P&lt;0.01)

### III RESULTS

#### A. Parameters changes of the Body composition before and after training

Data on changes of the Body composition before and after 16week Tennis training were collected, Analysis with Paired sample T test, the result summarized inTable 2、3. The result reveal that all subjects' body mass and BMI were decreased significantly, but BMR increased significantly.

#### B. The difference of 16 weeks tennis training for its influence on girls and boys body composition.

Contrasted table 2 with table 3, After exercise intervention for girls, most of the body composition index were changed significantly.body mass,fat mass,and BMI were reduce(P<0.01). LBW, BMR and muscle mass were increased(P<0.05). For boys, after exercise intervention, The statistical data shows that only body mass,BMR and BMI were reduce(P<0.05). The others had a similar trend to that of girls. However, the degree of change than girls.

### IV DISCUSSION

Appropriate body composition is fundamental for keeping physical fitness. This study has nosed out some interesting facts that all subjects' body mass and BMI were decreased significantly, but BMR increased significantly. And for girls, fat mass reduce significantly, LBW, BMR and muscle mass were increased. It was found out that 16weeks tennis training intervention increases fatty acid oxidation in skeletal muscle, to improve fatty acid metabolism, enhance protein synthesis after exercise and BMR. Tennis training has an effect on univ ersity student body composition, reduce body weigt BMI and fat mass, And will reach its ideal result.

The statistics on tennis exercise show that the rate of heart reach to 160-170/min in high-intensity exercise. 140-150 b/min moderate-intensity exercise, 100-130 b/min low-intensity exercise<sup>[4]</sup>.So tennis exercise can improve the ability of oxygen energy supply and glycolysis supply.One research<sup>[5]</sup> has shown that it is the energy supply characteristic of relying mainly on there are oxygen energy supplies as the foundation. The present study did affirmatively confirm the contention that fat mass reduced. The statistical data shows that tennis exercise imrove body composition significantly for girls than boys.

The present results shows that all subjects' body weight and BMI were decreased significantly, For girls, there is marked qualitative difference between before and after exercise intervention, But no for boys.That may be the amount of body fat boys was significantly lower than girls.

### V CONCLUSION

A. After 16 weeks tennis training, all subjects' body mass and BMI were decreased significantly ,But BMR, LBW and muscle mass increased significantly, it improved body composition.

B. Tennis exercise imrove body composition significantly for girls than boys.

C. In the light of the problems existing in students' exercise ability reduced, Tennis has the characteristics of aerobic and anaerobic metabolism, in moderate-intensity.it So it can be accepted as a good sport event to improve physical fitness for university students.

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