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A comparison of selected physiological variables between male athletes and non athletes

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Abstract

The purpose of this study was to compare the selected physiological variables between male Athlete and non athletes. 60 male subjects (athletes: 30 and Non athletes: 30) age group of 18 to 25 years, randomly selected from different institutes affiliated to Punjabi University Patiala, Punjab, India. Vital capacity of athletes was measured by Spiro meter. Peak flow rate was measured with a peak flow meter. The between-group differences were assessed by using t-test. The level of $p < 0.05$ was considered significant. The t-test revealed that male non athletes had significantly higher vital capacity and Peak flow Rate ($p < 0.05$) than male athletes. Further investigations are needed on the above studied variables along with motor fitness variables to assess relationships among them and with performances in male athletes and non athletes.

Keywords: Vital Capacity, Peak flow Rate, athletes, Non athletes.

1. Introduction

Human physiology is the bird in the house of the mechanical, physical, and biochemical functions of humans in good health, their organs, and the cells of which they are composed. The physiological factors limiting one's performance in sports are also well known. It is the understanding of interaction of all these factors that can help us in designing the way for selecting the children for appropriate game and training. Among the various physiological parameters, cardiovascular efficiency forms the basis to undertake sports efforts successfully. The physiological characteristics play an important role for the attainment of high level of sports performance that can ultimately be realized by taking into consideration the various physiological variables. Physiological variables may be defined as those variables which are directly linked with various physiological systems such as heart rate, blood pressure, vital capacity, Peak flow rate, respiratory rate and hemoglobin. Physiological variables such as cardiovascular efficiency, Peak flow rate, vital capacity and other should be taken into consideration while selecting athletes and non athletes cardio-respiratory endurance denoted capacity of individual to work effectively with the help of oxygen which is collected, transported and utilized by lungs, blood and muscles respectively. Any work as daily task or form of physical activity is directly related to energy supplying system which in turn is the cardio respiratory endurance. Cardiovascular endurance varies from individual to individual and one of the important variables for establishing top class performance in athletes and non athletes as the game involves work of long duration / endurance type. Several studies have documented the physiological and anthropometric characteristics of athletes and non athletes (González *et al.* 2005, Zaccagni *et al.* 2009, Hakkinen, 1993, Smith *et al.* 1992 MacLaren, 1990) [2, 3]. However, the purpose of the present study was to compare the selected physiological variables between athletes and non athletes.

2. Material and Methods

2.1 Subjects

Total 60 male subjects (athletes: 30 and Non athletes: 30) age group of 18 to 25 years, randomly selected from different colleges affiliated to Punjabi University Patiala, Punjab, India. All the subjects, after having been informed about the objective and protocol of the study, gave their consent and volunteered to participate in this study.

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2.2 Selection of variables

1. Vital Capacity
2. Peak Flow rate

3. Methodology

3.1 Vital capacity

The subject was asked to take a deep breath and then to blow hard into the mouthpiece of the Spiro meter with a sharp blast. Vital capacity was measured by Spiro meter. Three recordings were taken at one-minute intervals and the average of the three highest readings was noted. Subjects asked to follow a maximum inspiration, all the air possible was forcibly exhaled through the mouthpiece. (Ghai, 2007)^[1]

3.2 Peak Flow Rate

Peak expiratory flow measures how fast you breathe out when you try your hardest. It tells you how well your lungs are working. The subject was asked if you can breathe out quickly and with ease, you will have a higher number (higher peak flow rate) and if you can breathe out slowly and with difficulty, you will have a lower number (lower peak flow rate). Three recordings were taken at one-minute intervals and the average of the three readings was noted. Peak flow rate was measured with a peak flow meter. (Ghai, 2007) ^[1]

3.3 Statistical Analysis

Values are presented as mean values and SD. The ‘t’ test was used. A significance level of $P < 0.05$ was considered significantly different.

4. Results

Table 1: Comparison of selected physiological variables of athletes and Non athletes

| Variables | athletes (N= 30) | | Non athletes (N=30) | | t-value |
|----------------|---------------------|-------|------------------------|-------|---------|
| | Mean | SD | Mean | SD | |
| Vital capacity | 3.790 | 0.286 | 4.726 | 0.086 | 17.11* |
| Peak Flow Rate | 353.33 | 49.64 | 386.33 | 32.10 | 3.05* |

* indicates $p < 0.05$

Table: 1 shows the vital capacity and peak flow rate of male athletes and non athletes. The mean values of vital capacity of male athletes and non athletes were 3.790 and 4.726 respectively. Whereas the peak flow rate of male athletes and non athletes were 353.33 and 386.33 respectively. The male non athletes were found to have significantly greater vital capacity ($t=17.11$) and peak flow rate ($t=3.05$) as compared to male athletes.

5. Discussion

The results of physiological variables (i.e., vital capacity and peak flow rate) between athletes and non athletes are presented in table-1. The male non athletes were found to have significantly greater vital capacity ($t=17.11$) and peak flow rate ($t=3.05$) as compared to male athletes. Results are in line with the findings of Zaccagni *et al.* (2009) which revealed that physiological traits differ with regards to former and current elite athletes. It is evident from the above findings that significant differences were observed between male athletes and non athletes on the parameters of vital capacity and peak flow rate. While comparing the mean values of groups it shows that non athletes have significantly greater with regard to vital capacity and peak flow rate. This might be due to the higher level of training of non athletes.

6. Conclusion

In conclusion, the present study revealed that the male non athletes had significantly greater vital capacity and peak flow rate than athletes. The subject-pool of this study involved healthy, college-aged males. Whether the observed study patterns apply to other population groups such as the elderly, impaired, or specially others games trained athletes remains a question for future study.

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