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### Original article

## The comparative study of aerobic capacity in trained and untrained subjects

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#### ABSTRACT

**Aim:** To evaluate aerobic capacity in trained and untrained subjects by recording systolic blood pressure and Vo<sub>2</sub> max after exercise. **Methods and Materials:** In the present study 40 healthy male subjects who are studying physiotherapy course between the age group 22-24 years were selected. One group is not having any specific physical exercise that is control group and the second group which includes subjects who regularly do the cycling for 30 minutes all the days in a week since 6 months that is examination group. All the readings were taken 8:15 to 8:30 am from all the subjects before the breakfast. We took 3 readings for each parameter from each subject and took the average of the 3 readings. The subjects were asked to peddle the bicycle ergo metre first with a resistance of 2 kg for 5 minutes next with a resistance of 4 kg for 3 minutes there after resistance is increased by 0.5 kg for every 3 minutes until the subject is exhausted. Immediately after the exercise heart rate and systolic blood pressure were recorded with E.C.G and sphygmomanometer respectively. **Statistical analysis:** The data was analysed by using the Student's t-test. P value less than 0.05 is considered as significant. **Results & Conclusion:** Vo<sub>2</sub> max and the systolic blood pressure are higher in trained subjects than in untrained subjects after the exercise. P-value of systolic blood pressure is 0.001 and Vo<sub>2</sub> max is 0.005 which are highly significant.

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### 1. Introduction

Circulatory changes increase muscle blood flow while maintaining adequate circulation in rest of the body during exercise [1-3]. Trained and untrained subjects of same age and sex with same height and weight when asked to peddle the bicycle ergo metre trained subjects peddled the bicycle ergo metre with more resistance for longer duration than untrained subjects.

### 2. Materials and methods

#### 2.1. Material

A total of 40 subjects of two groups 20 each are taken in to the study. Inclusion criteria; average age is 23 years  $\pm$  1, height; average height is 168 cm  $\pm$  1, weight; average weight is 65 kg  $\pm$  1, all are male individuals. Exclusion criteria; diabetes, smoking, alcohol consumption any h/o congenital diseases, no h/o major illness or

surgeries in recent past. First group is not having any specific exercise that is control group and the second group who are doing daily cycling for 30 minutes all days in a week since 6 months. Bicycle ergo metre (Martin), which is having a wheel with a circumference of 158 cm which is supported with a wooden stand, recording counter- which can record the number of revolutions per minute. It is also having spring balance which can adjust the resistance. E.C.G., Sphygmomanometer are used to measure the heart rate and blood pressure respectively. Prior to the study each subject was informed in detail about the objectives of the study and method which has to be used and their consent was taken. All the subjects were attended the physiology lab at morning hours between 8 am to 8:30 am without breakfast. Height, weight were measured to the nearest 0.5 cm and 0.1kg respectively before the test. Heart rate and systolic blood pressure were recorded with E.C.G and Sphygmomanometer.

#### 2.2. Method

The subjects were asked to peddle the bicycle ergo metre first with a resistance of 2 kg for 5 minutes next with a resistance of 4 kg for 3 minutes there after resistance is increased by 0.5 kg for every

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3 minutes until the subject is exhausted. Immediately after the exercise heart rate was recorded with E.C.G and the blood pressure is recorded with sphygmomanometer.  $Vo_2$  max(ml/kg/min)=55.23-(0.09x heart rate /min).

### 2.3. Statistics

The data was analysed by using the Student's t- test.

### 3. Result and Discussion

Systolic blood pressure of trained subjects is more than that of untrained subjects after the exercise.  $Vo_2$  max also more in trained subjects than in untrained subjects. Trained subjects peddled the bicycle ergo metre for longer duration with more resistance than untrained subjects and this is the reason why trained subjects are having more systolic blood pressure and more  $Vo_2$  max than untrained subjects [4-6]. Usually one may think that the systolic blood pressure after exercise should be less in trained subjects than in untrained subjects because of less increase in heart rate in trained subjects

**Table 1. The mean values of SBP &  $Vo_2$  max in “Un-trained Subjects”**

Variables	Number	Mean	Std.Deviation	Std.Error mean
$Vo_2$ max	20	42.1080	1.42291	0.91817
SBP	20	119.250	7.30445	1.63333

**Table 2. The mean values of SBP &  $Vo_2$  max in “Trained Subjects”**

Variables	Number	Mean	Std.Deviation	Std.Error mean
$Vo_2$ max	20	43.1074	1.21863	0.27249
SBP	20	125.4500	7.53570	1.68503

SBP: Systolic Blood Pressure,  $Vo_2$  max: Maximum oxygen uptake (Aerobic Fitness).

P value of  $Vo_2$  max is =0.005

P value of SBP is P=0.001

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