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THE EFFECT OF EXERTION ON HEART RATE AND RATING OF PERCEIVED EXERTION IN INDOLENT FEMALES

Aisha Ansari[1], Mohammad Shahid Ali[1], Jagatheesan Alagesan[2], *Prathap S[1,3]

[1]Faculty of Medical and Paramedical sciences, Himalayan University, Itanagar, Arunachal Pradesh, India; [2]College of health sciences, Gulf Medical University, Ajman,UAE; [3]Aarogyam Hospital, Reengas, Sikar,Rajasthan,India

*Address for Correspondence: Dr. Prathap S, Aarogyam Hospital, Reengas, Sikar,Rajasthan,India
Email ID: bhanwarpunit6@gmail.com

ABSTRACT

Physical fitness is defined as "a set of attributes that people have or achieve that relates to ability to perform physical activity." Physically unfit leads to problems like overweight, obesity and other cardiovascular issues. The need of this study to analyze the effect of exercises on heart rate and rate of perceived exertion in indolent females with other cardiorespiratory vitals using a using short bout of exercises in normal healthy females. Healthy females according to BMI aged 20 to 30 years were recruited using convenience methods (N = 50). The results were obtained using t-test. The group was homogenous at the baseline and showed statistically significant changes after intervention with short bout of exercises. Present study indicates that the major vital of cardiorespiratory fitness that is VO2 max was 34.78±3.2 in normal BMI group. Along with this level of perceived exertion was 14±3 among normal BMI group. After the post exercise heart rate, blood pressure and respiratory rate of normal individuals fall in the good range. This study indicates the increased need of physical activity among young females and keeps their BMI under control to avoid any cardiorespiratory complications.

Keywords: BMI; Cardiorespiratory fitness; RPE; VO2 max

INTRODUCTION

Obesity and weight gain are imposing a growing threat to world health, as in many countries 20–30% of adults are categorized as clinically obese, and their number is still increasing (WHO,1999; WHO 2002). Many studies have demonstrated an association of both a high body mass index (BMI) and a sedentary lifestyle with greater risk for cardiovascular disease (Wang and Lobstein, 2006). Physical activity (PA) improves cardiorespiratory fitness and is associated with reduced health outcomes such as cardiovascular disease (Kurth and Schaffrath, 2007). Physical activity has also been shown to lower resting heart rate and lower resting blood pressure (He et al., 2011). Heart function can be described as the various measures of efficiency for the heart and circulatory systems during rest and activity (e.g. resting and exercise HR, resting and exercise BP, resting and exercise FEV1,FVC). And to investigate whether regular exercise was protective against reduced heart rate, or adverse effects of obesity and weight gain on heart rate

were modified by regular exercise (Haerens et al., 2007). Nonetheless, emerging evidence supports the notion that a lifestyle-modification program characterized by an increase in physical activity and a balanced diet can reduce obesity and the risk of obesity-related comorbid conditions despite minimal or no weight loss. Clinicians could encourage positive lifestyle changes in their patients by counseling them that obesity and its associated health risks can be reduced in response to an increase in physical activity with or without weight loss. Physical activity (PA) is associated with higher cardiorespiratory fitness values, but additional information is needed on the contributions of specific types and amounts of physical activity (Aires et al., 2010). The purpose of this study is to determine changes and the response in cardiopulmonary functions after exercise testing protocol in ideal subjects (Ortega, 2010) and investigate whether regular exercise was protective against reduced heart rate, a clinically relevant predictor of cardiovascular

morbidity and mortality, and whether adverse effects of weight gain on heart rate were modified by regular exercise (Haerens et al., 2007).

MATERIALS AND METHODS

The target population of this study consists of 40 participants. Initial explanation about the aim and purpose of the study, test procedure, method of testing, instructions on how to perform test was given. Explanations about the procedure of parameters to be measured before and after the test were given. Subjects were oriented about Borg's rating of Perceived Exertion and how to rate it. A written consent was taken from all the participants and the study was approved by institutional ethical committee. The participants were selected based on following selection criteria.

Inclusion Criteria
- Females were included.
- Healthy population according to BMI.
- Age Between 20 to 30 years.

Exclusion criteria
- Hypertension.
- History of exertional dyspnea.
- Known case of Cardiac and respiratory disease.
- Diabetes, Hepatic disease, Cancer etc.
- Females under hormonal replacement therapy.
- Pregnancy.

Preparation of Subjects
- Before the test the subject should not indulge them into any activities.
- Before commencement of test the subjects should be asked to rest for half an hour, so that the vital signs might come down to steady state, than all vital signs will be measured.
- Subjects are expected not to have heavy meals/tea/coffee at least 2 hours before

exercise and care is taken that they are properly hydrated.
- Subjects are advised to wear loose clothing.

Vital Signs Measurement

Position: All subjects were seated in a relaxed sitting posture on a chair

Resting Heart Rate: A manual method of taking a heart rate was done by feeling the pulse on the radial side of the wrist for 1 minute.

Respiratory Rate: Will be measured by observing the chest movement of the subject for 1 minute.

Exercise procedure: All subjects underwent a three minutes step test as short bout of exercise. At the end of each minute, ask the subject to use the RPE scale, from 6 to 20, to describe how hard they feel they are working at that time. Heart rate is measured at 1 minute, 2 minutes and 3 minutes interval for all the participants.

RESULTS AND DISCUSSION
Data analysis

This study was performed with 40 normal BMI females. The age group selected was 20 to 30 years. The basic demographic data obtained included age, BMI, physical activity, heart rate, BP. The outcome measures used in this study are RPE, VO2 max, heart rate, respiratory rate, and BP that are measured before and after exercises. Statistical analysis of the data collected was done using SPSS software. Paired t- test was used to analyze within group data and independent t-test was used to analyze between group values with 95% of level of confidence and p=0.05.

Table-1: Demographic data showing age, height, weight, heart rate, blood pressure and respiratory rate at baseline

Group	Age	Height	Weight	BMI	Heart Rate	Blood	Respiratory rate
Normal	25±4	159±7	52±3	21±4	77±7	112±5/80±7	13±4
P value	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05

Values are express as Mean ± SD

The above table shows the baseline details of both groups in terms of age, height, weight, heart rate, blood pressure and respiratory rate. The age in normal BMI group is 25±4. The height in normal group is 159±7. The weight in normal group is 52±3. The BMI in normal group is 21±4. The heart rate in normal group is 77±7. The blood pressure in normal group is 112±5/80±7. The respiratory rate in normal group is 13±4. P value for all these variables by using independent t-test at baseline is more than 0.05 and confirms the homogeneity of groups before the commencement of the intervention

Table-2: Data analysis in group

	Heart Rate	Blood pressure	Respiratory rate
Before	77±7	112±5/80±7	13±4
After	98±6	154±3/112±5	22±9
P value	<0.05	<0.05	<0.05

Values are expressed as Mean ± SD

The above table shows with in group data analysis of group by using paired t-test for the outcomes Heart Rate, Blood pressure and Respiratory rate before and after the intervention. The heart rate before is 77±7 and after is 98±6. The blood pressure before 112±5/80±7 and after is 154±3/112±5. The mean ±SD of Respiratory rate before 13±4 and after is 22±9. P value for all these variables before and after is less than 0.05 and confirms the statistically significant improvement in all the variables after intervention.

Table-5: Normal group after intervention for VO2 max and RPE

Groups	VO2 max	RPE
Normal group	34.78±3.2	14±3
P value	<0.05	<0.05

Values are expressed as Mean ± SD

The above table shows the after intervention details of normal group in terms VO2 max and RPE. The VO2 max in group is 34.78±3.2. The RPE in group is 14±3. P value for variables by using independent t-test after intervention is less than 0.05 and confirms the statistically significant difference in group after the intervention.

Physical fitness is an important part of life. It is an indicator which shows whether you have the ability to perform and enjoy day to day physical activities with ease. A large percentage of the adult population is relatively physically inactive. In a 1997 survey, only 34% of the population sampled (15 years and older) exercised one or more times a week, citing lack of time as a major factor for remaining inactive. The high incidences of cardiovascular diseases and modern scientific studies connecting physical activity and mortality of adults since the 1950s have resulted in increased awareness and research attention in cardiorespiratory fitness of the general population.

Numerous surrogate field measures have been developed to predict VO2max or simply categorize individuals. These methods commonly employ stepping, walking and running and more recently, stair-climbing. Thus by having a simple test, individuals can then easily assess their fitness at regular intervals, and at their own convenience (The et al., 2000; Tan et al., 2004). Step tests vary in stepping frequency, step height, test duration, the number of stages and scoring method. Most step tests employ the oxygen demand of the step rate and/or the recovery heart rate (HRrec) from the stepping exercise as the key variables to predict an individual's VO2max. Individuals with different body composition may also impact the results obtained during sub maximal exercise

testing and thus, may affect the prediction of VO2 max. In other words, at any given sub maximal workload, an individual with excess body weight will work at a higher percentage of their VO2max (Tan et al., 2004).

Vitals like VO2 max, rate of perceived exertion and post exercise heart rate were taken as markers to evaluate cardiorespiratory fitness. The result of the present study shows that higher is the BMI higher is their exertion level and lower is their cardiorespiratory fitness. It shows that fitness levels of the individuals of age group 20-30 years is poor.

CONCLUSION

Present study indicates that the major vital of cardiorespiratory fitness that is VO2max and level of perceived exertion of individuals is poor. After the post exercise heart rate, blood pressure and respiratory rate of normal individuals fall in the good range.

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