

Original Article

A comparative study of change in Blood Pressure & Heart Beat before and after training

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ABSTRACT:

Background: Epidemiological studies suggest an inverse relationship between blood pressure and habitual physical activity and it has been suggested that adequate dynamic physical training contributes to the control of blood pressure. The present study was conducted to assess change in heart rate and blood pressure in adults before training and after training. **Materials & Methods:** This study was conducted in department of physiotherapy in year 2012. It consisted of 100 subjects with equal numbers of males and females. Both heart rate and blood pressure was recorded by palpating radial pulse/minute and BP apparatus and sphygmomanometer respectively in all subjects. **Results:** There was significant decrease in heart beat and blood pressure at rest, during walking and running after training. **Conclusion:** Author concluded that both heart rate and blood pressure decreases after training. Physical exercises have found to be effective in preventing cardiovascular diseases.

Key Words: Blood pressure, physical exercise, sphygmomanometer

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INTRODUCTION

Walking and running are two physical exercises which have got public health benefits especially for cardio production are widely accepted. Among the many biological mechanisms proposed to account for these risk-reducing effects is autonomic nervous system, regulate of heart rate.¹

Weight reduction, salt restriction, moderation of alcohol consumption, and increased physical activity are generally accepted lifestyle measures for the management of hypertension. Epidemiological studies suggest an inverse relationship between blood pressure and habitual physical activity and it has been suggested that adequate dynamic physical training contributes to the control of blood pressure.²

During exercise heart rate and peripheral vascular resistance decrease whereas exercise such as walking and running increases heart rate and blood pressure in response to vasodilatation of resistant arterioles within exercising skeletal muscle.³

Cardiovascular diseases can be prevented by physical activity in general, and for the prevention, treatment and control of high BP in particular. However, increasing rates of urbanization and associated behavioral changes have led to a higher prevalence of a sedentary lifestyle in Western Societies. Whereas aging is associated with an alteration of autonomic balance and an increase in BP, daily exercise tends to decrease in older participants.⁴

Studies reveal that aerobic exercise increases autonomic control of the heart, as indicated by training induced reductions in heart rate and blood

pressure or increase in heart rate and blood pressure. Many studies reported no effect of training, any differences between trained and untrained.^{5,6} The present study was conducted to assess change in heart rate and blood pressure in adults before training and after training.

MATERIALS & METHODS

This study was conducted in department of physiotherapy in year 2012. It consisted of 100 subjects with equal numbers of males and females. Following inclusion and exclusion criteria was used.

Inclusion:

1. Adults above 18 years of age.
2. Subjects free from any cardiovascular and respiratory disease.

Exclusion:

1. Subjects with history of smoking, hypertension.
2. Subjects with orthopaedic disorder.

Each subject was asked to walk on the 1000M track. Following which a rest of 5 minutes was given to subjects. The procedure was repeated after rest and both heart rate and blood pressure are recorded by palpating radial pulse/minute and BP apparatus and sphygmomanometer respectively.

Each subject was given training such as walking and running daily for 20 minutes for 3 months and then blood pressure and heart rate was calculated both

during walking and running. Results thus obtained were subjected to statistical analysis using chi- square test.

RESULTS

This study comprised of 100 subjects which includes 50 males and 50 females. (Table I)

Heart rate was measured at rest, during walking and running before training as well as after training. The mean heart rate recorded at rest (80.2) before training decreased significantly (P-0.01) after training (70.4). Similarly, at walking before training (122.4) and after training (104.6), there was significant decrease in rate (P-0.02). There was significantly decrease in mean heart rate 170.4 to 136.1 recorded before training and after training respectively (P-0.001). (Graph I). Graph II shows that there was significantly decrease in mean systolic blood pressure recorded before training and after training. At rest, it decreased from 110.2 to 102.6 (P-0.03). at walking before training, the value was 130.4 which after training decreased significantly (P-0.02) to 116.4. Similarly at running values changed from 150.6 to 122.8. Graph III shows that there was significant decrease in diastolic blood pressure before training and after training. At rest, walking and at running, the diastolic blood pressure before training was 68.8, 76.2 and 80.4 respectively. After training, it showed values of 64.2, 66.4 and 74.6 respectively. The difference was significant (P-0.01).

TABLE I: Distribution of patients

TOTAL - 100		
GENDER NUMBER	MALE	FEMALE
	50	50

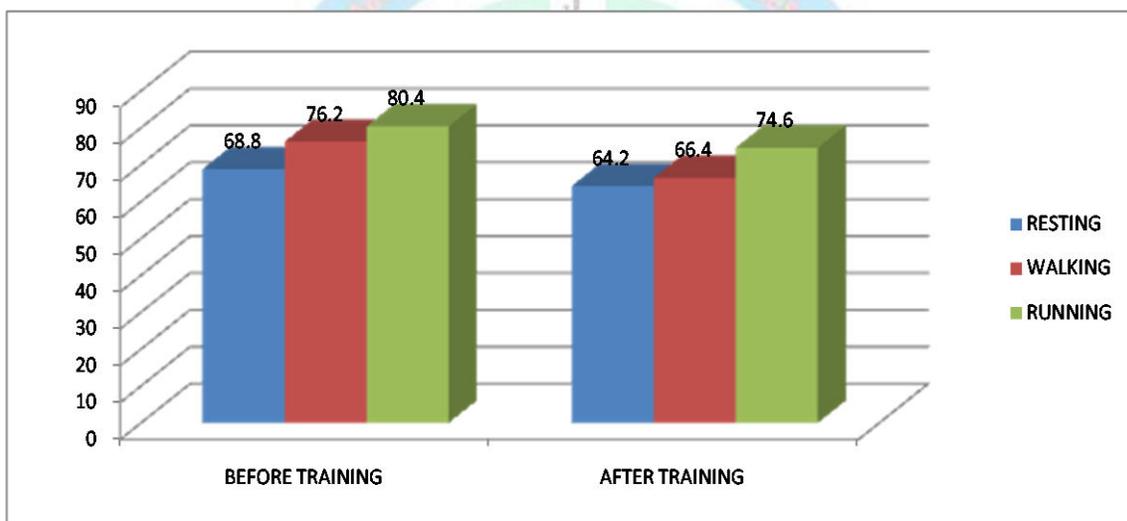
GRAPH I: Measurement of Heart Rate (Mean)



GRAPH II: Measurement of systolic blood pressure (Mean)



GRAPH III: Measurement of diastolic blood pressure (Mean)



DISCUSSION

Most studies dealing with post-exercise blood pressure responses have demonstrated that exercise reduces blood pressure during the recovery period. Somers et al observed that blood pressure levels are significantly lower than pre exercise levels only during the first hour of recovery, while Pescatello et al.⁷ found a significant blood pressure fall up to 12 h after exercise.

The present study was done to assess change in heart rate and blood pressure in adults before training and

after training. We included 100 subjects having equal number of males (50) and females (50). In our study, the heart rate and blood pressure was measured before training and after training at rest, during walking and during running and was compared whether there was any increase or decrease in their values.

The mean heart rate recorded at rest (80.2) before training decreased significantly (P<0.01) after training (70.4). Similarly, at walking before training (122.4) and after training (104.6), there was significant

decrease in rate (P=0.02). Uusitalo et al.⁸ reported similar results. They suggested that aerobic training caused decreased in heart rate in adults after 5 years of regular exercise.

We also measured systolic blood pressure in all adults before training and after training. We found that there was significantly decrease in mean systolic blood pressure recorded before training and after training. Our results are in agreement to the results of Owen A et al⁹ who reported similar observations.

We also measured diastolic blood pressure in all adults before training and after training. At rest, walking and at running, the diastolic blood pressure showed significantly decrease in values after training. The study by Kristen et al¹⁰ reported similar results.

Kingnell et al.¹¹ suggested that isometric exercises done for less than an hour in a week is sufficient enough to reduce systolic blood pressure by 10.4mm/hg and diastolic blood pressure 6.8mm/hg. They suggest that an increase in aerobic physical activity should be considered as an important component at life style modification for prevention and treatment of blood pressure.

CONCLUSION

Author concluded that both heart rate and blood pressure decreases after training. Physical exercises have found to be effective in preventing cardiovascular diseases.

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