

Original Article

COMPARISON OF HEART RATE AND BLOOD PRESSURE CHANGES DURING WALKING AND RUNNING BEFORE AND AFTER TRAINING IN HEALTHY ADULT WOMEN

Kaarna Munisekhar ^{*1}, M.V Muralidhar ², Madras Venkatachalam ³, D Hemalatha ⁴.

^{*1} Tutor, Department of Physiology, Sri Venkateswara Institute of Medical Sciences, Tirupathi, Andhrapradesh, india.

² Assistant Professor, Department of Physiology, S.V Medical College, Tirupathi, Andhrapradesh, India.

³ Associate Professor, Department of physiology, S.V Medical College, Tirupathi, Andhrapradesh, India.

⁴ Medical officer, Ayurvedic Dispensary, Yamaganipalle, Kuppam, Andhrapradesh, India.

ABSTRACT

AIM: Physical exercise has been associated with heart rate and blood pressure in observational studies and individual clinical trails. The purpose of these study was to asses heart rate and blood pressure changes in healthy adult women students before and after training during walking and running.

MATERIALS and METHODS: Fourty healthy women were taken as the subjects. Heart rate and blood pressure recorded before and after training during waking and running. In these study 1600 metres track measured using PCV reel tape was used for walking and running. The durational training programme five months. Every day 15-20 minutes walking and running.

RESULT: The examination at parameters BMI, Heart rate, Blood pressure, and SBP, DBP and study statistical analysis was estimated for all subjects. The data were analysed by disruptive and intervention studies.

DISCUSION: The finding suggested a significant decrease in heart rate and blood pressure in healthy adult women after training as compared to before training for both during walking and running show that heart rate and blood pressure changes.

CONCLUSION: The present study should that physical activity has the ability to decrease the heart rate and arterial blood pressure in healthy adult women. After training physical activity reduce the risk of heart diseases.

KEYWORDS: BMI, Heart rate and Blood pressure.

Address for correspondence: Kaarna Munisekhar, Tutor, Department of Physiology, Sri Venkateswara Institute of Medical Sciences, Tirupathi, Andhrapradesh, india.

E-Mail: muniphysiology81@gmail.com

Access this Article online

Quick Response code



International Journal of Physiotherapy and Research

ISSN 2321- 1822

www.ijmhr.org/ijpr.html

Received: 12-03-2014

Accepted: 06-05-2014

Peer Review: 15-03-2014

Published: 11-06-2014

INTRODUCTION

The public health benefits of physical exercise like walking and running, 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.

During an exercise such as walking and running

heart rate and blood pressure increase during exercise heart rate and peripheral vascular resistance decrease in response to vasodilatation of resistant arterioles within exercising skeletal muscle.

Most of the studies report that aerobic exercise enhances 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. We hypothesised that cardiac autonomic regulation would be improved by walking and running but not strength training.

MATERIALS AND METHODS

Subjects this experimental study was carried out in sri venkateswara institute of medical sciences (SVIMS), Tirupathi, A.P in India. The test group included 50 females age 18-24years old healthy adult students of BPT and Paramedical and M.sc who volunteered to practice and were randomly selected.

Each subject was asked to walk on the 1600M (1mail) track after which a 10minutes rest was given. The subject was then asked to run on the same distance. Immediately heart rate and blood pressure are recorded. The same subjects were then given physical training which involved walking and running for 30 minutes duration daily for 3 months and then heart rate and blood pressure was calculated both during walking and running using sphygmomanometers' for recording blood pressure and heart rate was recorded by palpating radial pulse/min. Results were analysed.

INCLUSION CRITERIA:

Healthy adult women subjects of age group 18-24 years are included, subjects should be active and free of cardiovascular and respiratory disorders, and subjects should be able to walk or run distance of 1600M before and after training.

EXCLUSION CRITERIA:

Subjects having orthopaedic limitation, smoking history, hyper tension, cardio vascular and respiratory disorders medications affecting metabolism are excluded.

INSTRUMENTS:

1600mts (1mail) track measured by using open PVC reel tape, Manual sphygmomanometer and stethoscope are used to measure the blood pressure and heart rate manually.

STATISTICAL TESTS:

The data was analysed by using student and paired test in statistical package for social sciences .The P-value < 0.05 were considered to be significant.

RESULTS AND TABLES

According to measurements, two groups are not significantly different in terms of height, weight and BMI. Heart rate in before training during walking and running on track significantly high in before training subjects, compared with after training subjects.

Table No.1: MEAN, STANDARD ERROR MEAN AND P-VALUE FOR THE HEART RATE (BEATS/MIN) Levels Before And After Training.

	HEART RATE (BEATS/MIN)				P-VALUE
	BEFORE		AFTER TRAINING		
	MEAN	SD	MEAN	SD	
RESTING	78.1	9.78	68.18	7.28	0.00*
WALKING	126.2	11.45	106.58	11.17	0.00*
RUNNING	169.25	12.46	127.93	13.25	0.00*

Before training during walking and running Mean and SD 126.20±11.45, 169.25±12.46, and after training during walking and running Mean and SD 106.58±11.17, and 127.93±169.28. after training significant decrease was observed during resting, walking and running when compared to before training, p-values were 0.01.

Table No.2: MEAN, STANDARD ERROR MEAN AND P-VALUE FOR THE SYSTOLIC BLOOD PRESSURE (SBP) levels before and after training

	SYSTOLIC BLOOD PRESSURE (SBP) (mm/Hg)				P-VALUE
	BEFORE TRAINING		AFTER TRAINING		
	MEAN	SD	MEAN	SD	
RESTING	99.6	8.38	95.1	6.9	0.02*
WALKING	115.88	8.38	102.5	6.35	0.00*
RUNNING	144.85	12.88	124.35	16.53	0.04*

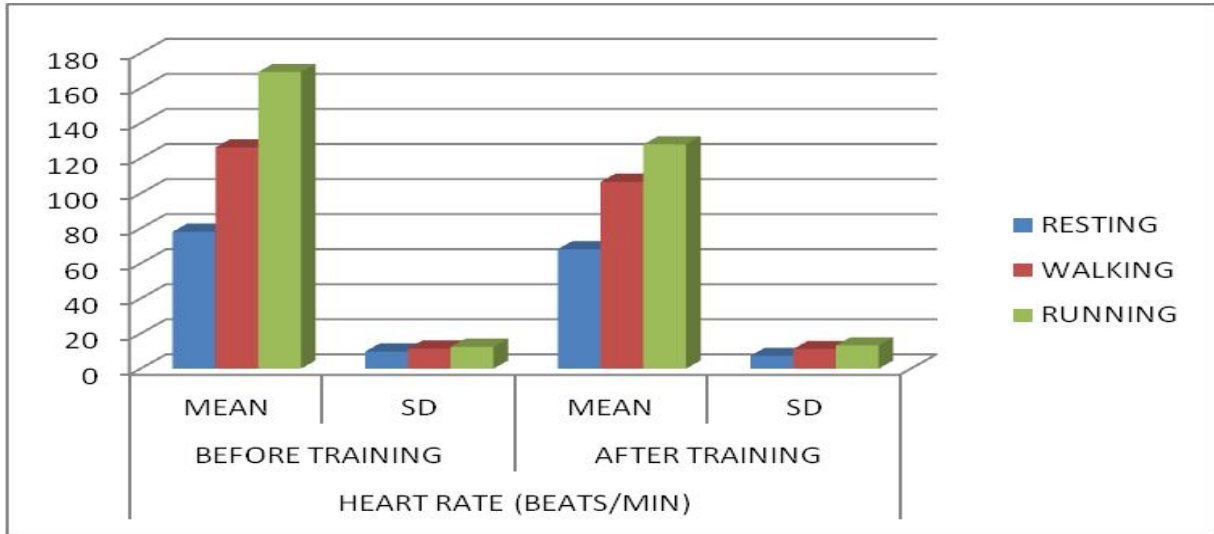
Statistical analysis showed a significant difference in SBP values between before and after training in healthy adult women during walking and running Mean and SD 115.88±8.38, 137.20± and 102.50±6.35, 124.35±16.53 significant difference were also found between before training and after training subjects.

Table No.3: MEAN, STANDARD ERROR MEAN AND P-VALUE FOR THE DIASTOLIC BLOOD PRESSURE (DBP) levels before and after training.

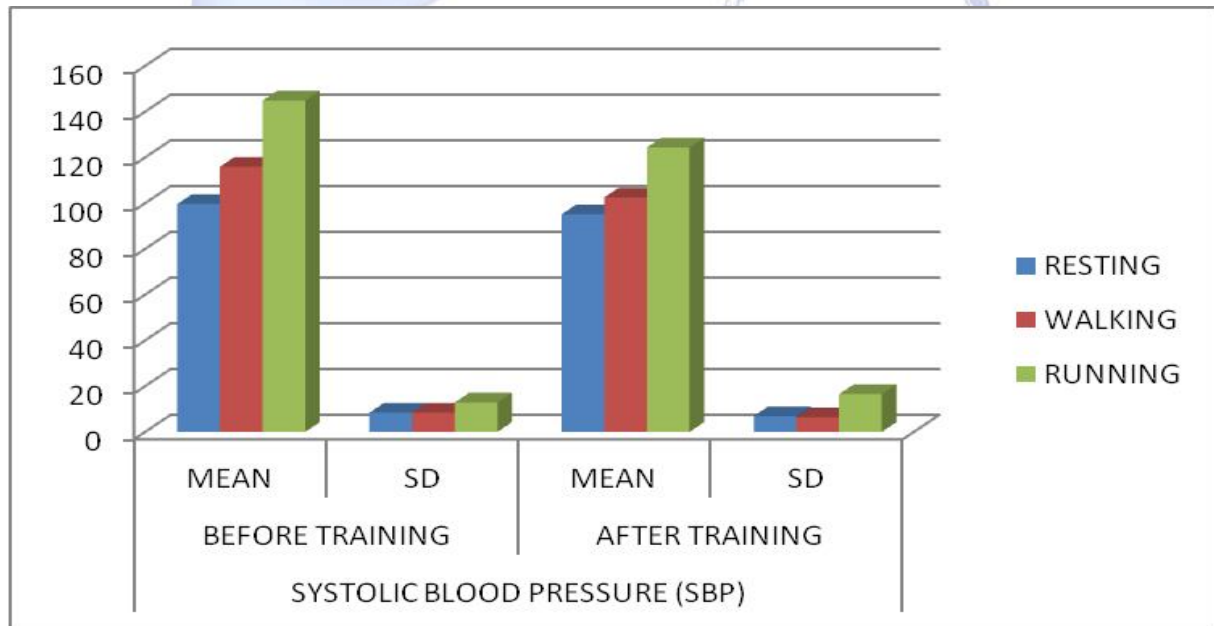
	DIASTOLIC BLOOD PRESSURE (DBP) (mm/Hg)				P-VALUE
	BEFORE TRAINING		AFTER TRAINING		
	MEAN	SD	MEAN	SD	
RESTING	66.2	5.67	62.15	3.43	0.00*
WALKING	76.65	12.22	67.75	5.77	0.00*
RUNNING	77.7	10.67	72.3	7.27	0.01*

In DBP values during walking and running Mean and SD 76.65±12.22 , 77.70±10.67 and 67.75±5.77, 72.30±7.37 statistically significant p-value were 0.01.

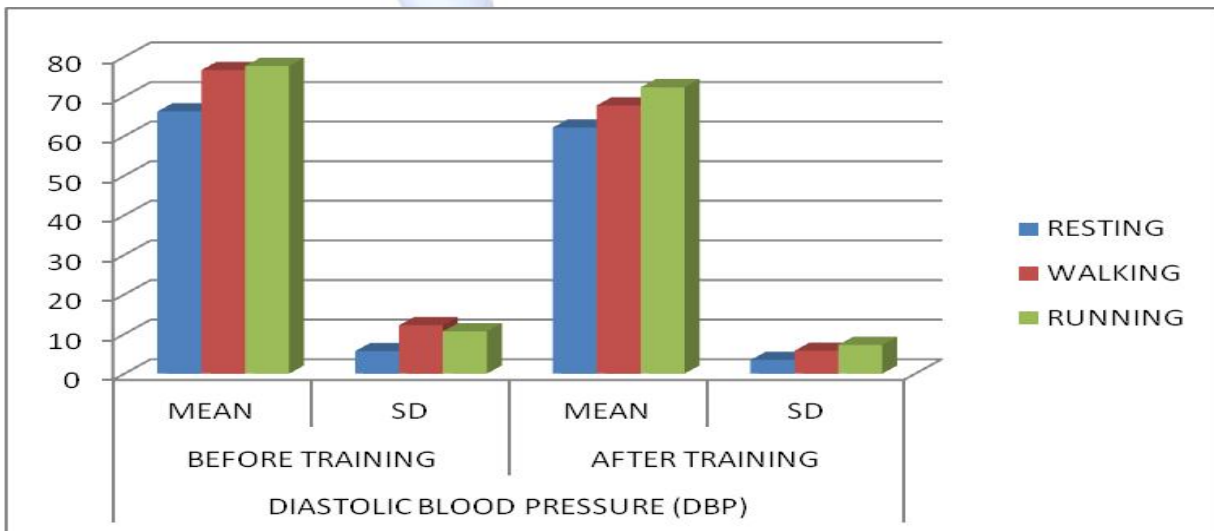
GraphNo.1:



GraphNo.2:



GraphNo.3:



DISCUSSION

Our results showed that the two groups were not significantly different in terms of Height, Weight and BMI. Our findings are similar to Mohammad Reza shahrak et al.¹

According to the results of the present study, heart rates were more significant in before and after training, in before training healthy adult women compared to after training women in same group. Results are similar to Uusitalo et al.² Also reported that aerobic training caused decreased in heart rate in adults after 5 years of regular exercise. During walking and running involves muscular activities sympathetic nerve that pass impulses to vasoconstriction area which acts as a cardio acceleratory centre situated in the reticular formation of medulla in the floor of 4th ventricle. After training heart rate creates an imbalance between the isotonic activity of sympathetic accelerator and parasympathetic depressor. Neurons in factor of greater vagal dominance in sympathetic activity and small decrease in sympathetic discharge. Training also decreases the intrinsic firing rate of sinoatrial node.³

In addition, all through SBP increases in during walking and running on track before training and after training subjects during exercise. Blood pressure values were higher in before training subjects compared to after training. Increase in SBP and reduction in DBP were observed in both before and after training female subjects. Our study similar to Becker et al.³

Before training the SBP and DBP both are highly increase during walking and running. After training SBP and DBP slightly decreased in all subjects. This changes are similar to Corigat et al.⁴ also reported highly significant increased in SBP and DBP during running.

Owen et al.⁵ found isometric exercises for less than an hour per week 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 night blood pressure.

CONCLUSION

The present study should that physical activity

has the ability to decrease the heart rate and arterial blood pressure in healthy adult women. After training physical activity reduce the risk of heart diseases.

Conflicts of interest: None

REFERENCES

1. Mohammad Reza Shahraki, Hamideh Mirshekari, Ahmad Reza Shahraki, Elham Shahraki, Marzieh Naroi. Arterial blood pressure in female students before during and after exercise. ARYA Atherosclerosis journal 2012 (spring); 8(1):12-15.
2. Uusitalo AL, Laitinen T, Vaisanen SB, Lansimies E, Rouramma R. Physical training and heart rate and blood pressure variability. Am J Physiol Heart Circ Physiol. 2004 May;286(5):H1821-6. Epub 2004 Jan 15.
3. Becker MM, Chaves MM, Selva OB, Moreire IE, Victor EG. Arterial blood pressure in adolescents during exercise stress testing. Arg Bras cardio 2007;88(3):329-33.
4. Reicherd P.Sloan, Petaer A. Shapiro, Md, Ronald E. et al. The effect of aerobic training and cardiac autonomic regulation in young adults. Am J Public Health. 2009 May; 99(5): 921-928.
5. Owen A, Wiles J, Swaine I, Effect of isometric exercise on resting blood pressure. JHum hypertension 2010;24(12):796-800.
6. Meizer GA westerterp KR, koper H, Ten Hoor F. Assessment of energy expenditure by recording heart rate and body acceleration. Medical sciences sports exerc. 1989;21(3):343-7.
7. Write RL, Swain DP, Branch JD. Blood pressure responses to acute static and dynamic exercise in three radial groups. MED SCI Sports, exercise 1999;3(12):1793-8.
8. Reuben Howden, J.Timothy light foot, Stephen J.Brown and IanL.Swaine. The effects of isometric exercise training on resting blood pressure and orthostatic tolerance in humans. Experimental physiology 2002;87(4):507-515.
9. Vernon Bond, EDD, Richard M. Millis, PhD, R.G. Adams, MD, Deborah Williams, MD, Thomas O. Obisesan, MD, Luc M. Oke, MD, PhD, Raymond Blakely, PhD, Paul Vaccaro, PhD, B. Don Franks, PhD, Marguerite Neita, PhD, Gwendolyn C. Davis, PhD, Ometha Lewis-Jack, PhD, and Charles O. Dotson, PhD. Normal Exercise Blood Pressure Response in African-American Women with Parental History of Hypertension. Am J Med Sci. Aug 2004; 328(2): 78-83.
10. Cox, K. L, Burke, V, Beilin, L. J, Grove, J. R., Blanksby, B. A, & Puddey, I. B. Blood pressure rise with swimming versus walking in older women: the Sedentary Women Exercise Adherence Trial 2 (SWEAT 2). Journal of hypertension,2006;24(2):307-314.
11. Kristen L. Rennie, Harry Hemingway, Meena kumari, Exic Brunner, Marek malik and Michard marmot. Effects of moderate and vigorous physical activity

- on heart rate variability in a British study of civil servants. *American journal of epidemiology* ;158(2):135-143.
12. ArjaL. T.Uustalo, Tomi Laitinon, Sari B., Vaisanen, ESKO Lansimies, and Rainer R.Auramaa. Physical training and heart rate and blood pressure variability. A 5-years randomized trail. *Am J Physiol Heart Circ Physiol*. 2004 May;286(5):H1821-6. Epub 2004 Jan 15.
 13. Costas Tsioufis, Stella Kyvelou, Dimitris Tsiachris, Panagiotis Tolis, Giorgos Hararis, Nikos Koufakis, Theodora Psaltopoulou, Demosthenes Panagiotakos, Peter Kokkinos and Christodoulos Stefanadis. Relation between physical activity and blood pressure levels in young Greek adolescents: The Leontio Lyceum Study. *Eur J Public Health* 2011; 21 (1): 63-68.
 14. Pigozzi F, Alabiso A, Parisi A, et al. Effects of aerobic exercise training on 24 hr profile of heart rate variability in female athletes. *J Sports Med Phys Fitness* 2001;41:101–107.
 15. Kingnell, B.A, G.L. Jennings. Effects of walking and other exercise programs upon blood pressure in normal subjects. *Med.J Aust*. 1993;158:234-238.

How to cite this article:

Kaarna Munisekhar, M.V Muralidhar, Madras Venkatachalam, Dalavai Hemalatha. COMPARISON OF HEART RATE AND BLOOD PRESSURE CHANGES DURING WALKING AND RUNNING BEFORE AND AFTER TRAINING IN HEALTHY ADULT WOMEN. *Int J Physiother Res* 2014;2(3):537-41.