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Different Intenstiy of Aerobic Exercise on FEV1 of Untrained College Men

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ABSTRACT

Aerobic exercise strengthens the muscles that are involved in respiration exercise that facilitate the flow of air in and out of the lungs. Pulmonary function among physically inactive men and women are probably the result of several factors. The most important of these in loss of elasticity of the lung tissue and chest wall as become age, which increases the work involved in breathing. The present investigation was conducted to explore the different intensity of aerobic exercise (high, medium and low) on FEV1 of untrained college men. To achieve these purpose sixty (N = 60) male untrained Bachelor's degree engineering students were selected randomly from R.M.K. College of Engineering and Technology, Chennai, India. There age ranged from 19 to 21 years. The subjects were randomly divided in to four equal groups (n = 15). All the experimental groups were underwent aerobic (walking, jogging and running) exercise for a period of 45 to 60 min/day/4 days/week for 15 weeks, it includes warm-up and cool down exercise. Group – I high intensity (HR 125 – 150/min-RLI of VO2 max 51 to 75%), Group – II medium intensity (HR 100-125/min-RLI of VO2 max 25-50%), Group – III low intensity (HR<100/min-RLI of VO2 max < 25%) aerobic exercises respectively and Group – IV control did not participate in any special training [7]. Data were collected on forced expiratory volume in one second (FEV1) by PC USB Spiro 2000 (Spirometer) before and after the intervention programme. Dependent 't' test was used to find out the difference between pre and post test. ANCOVA was employed to find out the adjusted post test means differences and Scheffe's post hoc test was also used to know the mean difference (P<0.05). From the results and limitation of this research it was concluded that, fifteen weeks of aerobic exercise improve FEV1 of untrained college men. However, among the exercise group high and medium intensity aerobic exercise are effectively improved FEV1.

KEYWORDS : Aerobic, Intensity, FEV1.

Introduction

Human beings are the most complex, difficult and fascinating part of nature. The improvement of human ability is possible through, a separate method and procedures of doing physical exercise [1]. Training is a systematic process of repetitive progressive exercise of work involving, learning and acclimatization [2]. The major objective in training is to cause biological adaptation in order to improve performance in a specific task.

Aerobic endurance is the ability of the body to supply oxygen and energy to the cells and remove waste products in order to sustain prolonged rhythmical exercise. An adequate supply of oxygen prevents to build up lactic acid, which produces fatigue in the muscle, and also, results in for the production of ATP-the basic energy source in the muscle [3].

Lung function might be partly to blame because it can change considerably in sedentary people during aging. Both vital capacity and forced expiratory volume in 1 second (FEV_1) decreased linearly with age, starting at age twenty to thirty. While these decrease, residual volume increases and the total lung capacity remains unchanged. As a result, the ratio of the residual volume to total lung capacity increases, meaning that less air can be exchanged.

Aerobic exercise is physical exercise of relatively low intensity that depends primarily on the aerobic energy generating process [4]. Generally, light to moderate intensity activities that are sufficiently supported by aerobic metabolism can be performed for extended period of time [5]. ACSM defines aerobic exercise as any activity that uses large muscle groups, can be maintained continuously and is rhythmic in nature. Acknowledge, it is a type of exercise that overloads the heart and lungs and causes them to work harder than at rest [6].

Any physical training (activity) leads to anatomical, physical, physiological, biochemical and psychological changes. The efficiency of a physical activity results from its duration, and repetitions (volume), load and velocity (intensity) and the frequency of performance (density). Hence the present investigation was conducted to explore the different intensity of aerobic exercise (high, medium and low) on FEV_1 of untrained college men.

Methodology

To achieve these purpose sixty (N = 60) male untrained Bachelor's degree engineering students were selected randomly from R.M.K. College of Engineering and Technology, Chennai, India. There age ranged from 19 to 21 years. The subjects were randomly divided in to four equal groups (n = 15). All the experimental groups were underwent aerobic (walking, jogging and running) exercise for a period of 45 to 60 min/day/4 days/week for 15 weeks, it includes warm-up and cool down exercise. Group – I high intensity (HR 125 – 150/min-RLI of VO_2 max 51 to 75%), Group – II medium intensity (HR 100-125/min-RLI of VO_2 max 25-50%), Group – III low intensity (HR<100/min-RLI of VO_2 max < 25%) aerobic exercises respectively and Group – IV control did not participate in any special training [7]. Data were collected on forced expiratory volume in one second (FEV_1) by PC USB Spiro 2000 (Spirometer) before and after the intervention programme. Dependent 't' test was used to find out the difference between pre and post test. ANCOVA was employed to find out the adjusted post test means differences and Scheffe's post hoc test was also used to know the mean difference (P<0.05).

Results

Table I. ANCOVA and 't' of Experimental Groups on Forced FEV_1 (litter)

Group	Adjusted post test mean	't' value	% improvement	'F' value
High intensity	3.73	15.66*	25.72	43.21*
Medium intensity	3.70	14.67*	24.47	
Low intensity	3.50	12.32*	18.56	
Control	3.09	5.11*	3.69	

't' table value 2.13 and F table value 2.78 respectively; *p > 0.05

Table II. Scheffe's post hoc test on FEV_1

High	Medium	Low	Control	MD	CI
3.73	3.70	–	–	0.03*	0.17
3.73	–	3.50	–	0.23*	
3.73	–	–	3.09	0.64*	
	3.70	3.50		0.20*	
	3.70		3.09	0.61*	
		3.50	3.09	0.41*	

From the result it was clear that, all the experimental (high, medium and low) groups improved FEV_1 of untrained college men. The improvement of FEV_1 was equally better for high and medium intensity aerobic exercise group then the low intensity group. The magnitude (%) of improvement is also reveals the same.

Discussion

Aerobic exercise strengthens the muscles that are involved in respiration exercise that facilitate the flow of air in and out of the lungs. Strengthens and enlarges the heart and lungs muscles. This improving aerobic conditioning pumping of blood and the heart rate. Tones muscle throughout most of the body.

In general huge volume and capacities changes little with training, vital capacity increases slightly. At the same time residual volume shows a slight decrease and the changes in these two volumes may be related. Overall, total lung capacity remains essentially unchanged. Following endurance (aerobic) training, total volume is unchanged at rest at standardized sub maximal levels of exercise.

The increase in trial volume (TV) during exercise contributes in part to an increase in minute ventilation. During maximal exercise, TV may be five to six times greater that at rest. The increase in TV result from utilization of both the inteiratory reserve volume (IRV) and the expiratory reserve volume (ERV), but probably more of the former than of the later.

The results of the study indicates that all the experimental groups significantly increased their forced expiratory volume in 1 sec ($FEVI_1$) from their baseline data. Among the training high and medium intensity aerobic groups shows better improvement of FEV_1 than low and control group.

Maximal aerobic exercise improves vital capacity, FEV_1, peak flow rate, FVC and respiratory exchange ratio [8]. Aerobic test protocol registered improvement on FEV_1 and vital capacity [9]. Regular physical activity has a strong positive impact on physical fitness, particularly on aerobic capacity [10]. Heavy exercise demonstrate greater expiratory flow limitation, an increased work of breathing and perhaps greater exercise induced arterial hypoxemia. The consequence of those pulmonary effects has the potential to adversely affect aerobic capacity and exercise tolerance [11]. High intensity aerobic exercise showed positive change in both forced vital capacity and FEV_1 [12]. The present study also shows the same.

It is generally accepted that people with higher levels of physical activity tends to have higher levels of fitness and tends to improve cardio-respiratory fitness [13]. Physical inactivity and low cardio-respiratory fitness and recognized as important causes of morbidity and mortality [14]. Cardio-respiratory fitness significantly improved and breath lessens decreased over a wide range of work corresponding to activities of daily living.

Twenty four weeks of aerobic exercise improves the lung function and maximal voluntary ventilation of over weight teenagers [15]. Thirty six sessions of 45 min interval aerobic running with 65 to 80% of heart rate reserve had significant effect on FEV_1 of non-athletic females [16]. In the present investigation results are also correlates with above findings. Aerobic exercise improves FEV_1, FVC and pulmonary functions of asthmatic patients [17] and for athletes and non athletes [18].

Ten week aerobic exercise training decreased fatigue in individuals with pulmonary arterial hypertension [19] and eight week high intensity intermittent running enhanced resting pulmonary function in prepubescent children [20]. Twenty weeks of high and low intensity aerobic exercise improves FEV_1 [21] and 8 weeks high intensity aerobic exercise also improves FEV_1 and VO_2 max of untrained college students [22]. The findings of the present study is also inconformity with the above results.

Conclusion

From the results and limitation of this research it was concluded that, fifteen weeks of aerobic exercise improve FEV_1 of untrained college men. However, among the exercise group high and medium intensity aerobic exercise are effectively improved FEV_1.

Implication

High and medium intensity aerobic exercises may be given to improve the pulmonary (FEV_1) function of untrained college men. Further, any intensity of aerobic exercise may be given as a therapy to improve pulmonary function.

REFERENCES

Hardayal Singh (1986), "Sports Training and General Theory Methods". Patiala, NIS Publishing, p. 45. | 2. Artheim D. Damiel and Carl E. Klafls (1963), "Modern Principles of Athletic Training", St. Louis: The CV Mosby Publishers, p. 93. | 3. http://en.wikipedia.org/wiki/aerobic exercise on 8.11.2012. | 4. Plowman A. Sharon and Demise L. Smith (2007), "Exercise Physiology for Health, Fitness and Performance", Lippincatt: Williams and Wilkins, p. 61. | 5. McArdle D. William, Frank I. Katch and Victor L. Katch (2007), "Essential of Exercise Physiology", Lippincott:Williams Wilkins, p. 204. | 6. http://www2.gu.edu/-www.fit/aerobic/html.on8-11-2012. | 7. Ghai, C.L (2007), "Text Book of Practical Physiology", 7th Edition, p. 194. | 8. Sezer, N (2004), "Cardiopulmonary and Metabolic Responses to Maximum Exercise and Aerobic Capacity in Hemiplegic Patients", Functional Newurol, 19(4): 233-8. | 9. Rouholah Fatemi and Mohsen Ghanbarzadeh (2010), "Assessment of Air Way Resistance Indexes and Exercise Induced Asthma after a Single of Submarginal Incremental Aerobic Exercise". Journal of Human Kinetics, 25: 59-65. | 10. Maaroos, J. and Landor, A (2001), "Anthropometric Indices and Physical Fitness in University Undergraduate with Different Physical Activity", Anthropologischer Anzeiger, 59(2): 157-63. | 11. Harons, C.A. (2006), "Does Gander Affect Pulmonary Function and Exercise Capacity", Respiratory Physiology and Neurobiology, 151(2-3): 124-31. | 12. Huang, G. and Osness, W.H (2005), "Changes in Pulmonary Function Response to a 10 Week Controlled Exercise Program in Sedentary Elderly Adults", Percept Mot. Skills, 100(2): 394-402. | 13. Burchfiel, C.M. and Sharp, D.S (1997), "Factors Assocaited with Variations in Pulmonary Function Among Elderly Japanese American Man". Chest, 112: 87-97. | 14. Twisk, J.W. and Brankman, M.N. (1998), "Tracking of Lung Function Parametes and the Longitudinal Relationship With Lifestyle", European Respiratory Journal, 12: 627-33. | 15. Ahmad Azad, Raza Gharakhanlou, Alireza Niknam, Amir Ghanbair (2011), "Effects of Aerobic Exercise on Lung Function in Overweight and Obese Students", Tanaffers, 10(3): 24-31. | 16. Zhra Hojati, Rajesh Kumar (2013), "The Effect of Internal Aerobic Exercise in Some Dynamic Pulmonary Volumes of Non-Athlete Female Students", Advances in Environmental Biology, (July) p. 1249. | 17. Reza, Farid et al. (2005), "Effect of Aerobic Exercise Training on Pulmonary Function and Tolerance of aCtivity in Asthmatic Patients". Iran J. Altergy Asthma Immunal., 4(3): 133-8. | 18. William, R. Komatsu, et al. (2010), "Aerobic Exercise Capacity and Pulmonary Function in Athletes with and without Type Diabetes. Diabetes Care, 33(12): 2555-7. | 19. Ali A. Weinstein, Lisa, M.K. Chin and Leighton Chan (2013), "Effect of Aerobic Exercise Training on Fatigue and Physical Activity in Patients with Pulmonary Arterial Hypertension", Respir. Med., 107(5): 774-84. | 20. Cedric Nourry et al. (2005), "High Intensity Intermittent Running Training Improves Pulmonary Function and Alters Exercise Breathing Pattern in Children. Eur. J. Appl. Physiol., 94(4): 415-23. | 21. Sandip Meghand Hulke et al. (2012), "Cardio respiratory Response to Aerobic Exercise Programs with Different Intensity", J. Res. Med. Sci., 17(7): 649-655. | 22. Shaw, I., B.S. Shaw, G.A. Brown (2009), "Role of Diaphragmatic Breathing and Aerobic Exercise in Improving Pulmonary Function and Maximal Oxygen Consumption in Asthmatics, Science and Sports, 25(3): 139-145. |