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HIGH AND LOW INTENSITY OF AEROBIC EXERCISE ON ADIPONECTIN PRODUCTION OF MIDDLE AGED OBESE MEN

V. Gopinath

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Abstract:-Since the turn of the century there has been an unprecedented acceleration in industrialisation. Although the greatest influence of this advanced technology boom has been registered in cities of south and north India, many emerging urban and suburban area also have experienced the effect of increased mechanisation. Obesity has been thought to be caused by basic hormonal imbalance resulting from failure of one or more of the endocrine glands to properly regulated body weight. To achieve this purpose forty-five (N=45) obese men (BMI 30 ± 1 Kg/m² In - Body 200) from total population of (obese volunteers) 173 were selected at random as subjects. Their mean age height and weight were 43 ± 2.7 years, 168 ± 6 cm and 81 ± 3.7 kg respectively. Further they were divided into three equal groups (n=15). Group I and II underwent low intensity (40 RPM) and high intensity (60 RPM) aerobic exercise (cycle ergometer) for 45 to 60 days/day/5days/week/16 week respectively and group III acted as control. The blood samples were collected and adiponectin (Microgram (μ g/ml) was estimated by biosource EASIA reader and ELISAAIDTM software before and after the experiment period. The data were analysed by ANCOVA and scheffe's post hoc test $P < 0.05$ considered to be statistically significant. Both high and low intensity aerobic exercise increases the adiponectin level than the control. Between the exercises high intensity shows better effect on the increases of adiponectin level of middle aged obese men.

Keywords:Aerobic Exercise, Adiponectin, Obese, Intensity.

INTRODUCTION:

Mechanization and automation, swift communication and transport, computer usage and television viewing have reduced the need for vigorous occupation and discouraged involvement in leisure-time recreational activity. Studies have reported that, there is a casual relationship between the risk of chronic disease incidence and mortality and physical activity and/or physical fitness.

Instruments of modern technology have reduced the number of hours during the day which wear devoted to maintain on existences, leaving increased amounts of leaser time. Rather than pursue vigorous leisure time activities the majority chose to become more sedentary often to the detriment of their health. In addition to the increased to hypokinetic diseases in highly industrialised nation

Essential fat is the minimum amount of fat necessary for basic physiological heath. There is a lot controversy over what amount of body fat is optional for overall health. American council of exercise (ACE) came to the conclusion that, certain low body fat ranges are under fat, which implies unhealthy. According to ACE , man who are between 40 – 45 years old with under 10% body fat are considered under fat were as a healthy range is described as between 10-19%

Obesity as reached epidemic proportion in India, in the 21st century, with morbid obesity affecting 5% of the country's population (1). India is following a trend of other developing countries that are steadily becoming more obese. Unhealthy, processed food as become much more accessible following India's continued integration in global food markets. Indians are genetically susceptible to weight accumulation especially around the waist (2).

Obesity is a main risk factor for number of disease. The etiology of obesity is unclear, although it appears that both genetic and environmental factor contribute to its development (3)

Obesity has also been experimentally and chemically linked with both physiological and psychological trauma. Hormonal imbalance, emotional trauma and alternation in basic homeostatic mechanism have all been shown to be either

High And Low Intensity Of Aerobic Exercise On Adiponectin Production Of Middle Aged Obese Men

directly or indirectly related to the onset of obesity. Environmental factors, such as cultural habit, inadequate physical activity and improper diets also can contribute to obesity.

METHODOLOGY

To achieve this purpose forty-five (N=45) obese men (BMI 30±1 Kg/m² In - body 200) from total population of (obese volunteers) 173 were selected at random as subjects. Their mean age height and weight were 43 ± 2.7 years, 168 ± 6cm and 81 ± 3.7kg respectively. Further they were divided into three equal groups (n=15). group I underwent low intensity aerobic exercise (pedal at cadence of 40 RPM of bicycle ergometer for 45 to 60 minutes per day /5 days/weak for sixteen weeks) group II underwent high intensity aerobic exercise (pedal at cadence of 60 RPM of bicycle ergometer for 45 to 60 minutes per day /5 days/weak for sixteen weeks) and group III acted as control. The blood samples were collected and adiponectin (µg/ml) was estimated by biosource EASIA reader and ELISAAIDTM software before and after the experiment period. The data were analysed by ANCOVA and scheffe's post hoc test P 0.05 considered to be statistically significant.

RESULTS

ANCOVA FOR SELECTED GROUP ON ADIPONECTIN

Test		Low Intensity Aerobic Exercise	High Intensity Aerobic Exercise	Control Group	SOV	SS	df	Ms	'F' Ratio
Pre Test	\bar{X}	5.69	5.42	5.75	B	6.91	2	0.454	0.42
	α	1.16	0.99	0.94	W	45.23	42	1.074	
Post Test	\bar{X}	8.39	9.28	5.80	B	98.11	2	49.05	49.87*
	α	1.03	1.08	0.84	W	41.31	42	0.984	
Adjusted Post Test	\bar{X}	8.34	9.43	5.70	B	108.52	2	54.25	137.74*
					W	16.51	41	0.394	

*P 0.05

SCHEFFE'S POST HOC TEST

Low Intensity Aerobic Exercise	High Intensity Aerobic Exercise	Control Group	Mean difference	Confidence Interval
8.34	9.43	-	1.09*	0.57
8.34	-	5.70	2.64*	0.57
-	9.43	5.70	3.73*	0.57

*Significant

High and low intensity aerobic exercise significantly increased adiponectin level than their baseline data. Between the exercises, high intensity aerobic exercise stands superior than the low intensity exercise group on the improvement of adiponectin level of obese middle aged men.

DISCUSSIONS

Health, which is considered as the most precious asset of human being, is highly determined by the physical fitness status of the individual. Fitness is optimized in the present-day western societies with a focus on two goals: health and performance. Lifestyles affect people health, with eating habits and regular physical activity being the two influential factor (4), irrespective of sex, age or country of residence (5).

Health-related fitness helps in the prevention of hypokinetic disease, in maximum development of intellectual capacity, and in full enjoyment of life (6). Although regular physical exercise has a positive influence on health, a high level of fitness-related health has a greater influence (7, 8). Everybody desires a long and healthy life and exercise has a great part to play in this. In one aspect the body can be said to commence ageing from the moment it is born, although it is usual to say it really begins in about the mid-thirties.

Therefore, the aim of this research is to summarise and synthesis the effect of different intensity aerobic exercise (Low intensity and High intensity) on adiponectin function (sensitivity) of middle age obese men. Obesity refers to the condition in which a person has an excessive amount of body fat. A sedentary lifestyle has been associated with an increased risk for two major metabolic and endocrine disorders: obesity and diabetes. Although nether disease by itself represents a major cause of death, both are strongly associated with other disuse that has high mortality rates such as hypertension, coronary artery disease and cancer. Furthermore millions of people have obesity, diabetes or both. The consequences of these diseases are debilitating and costs associated with their treatment are high.

Adipose tissue secretes multiple proteins known as adipocytokines that modulate various biological functions. One of these adipocytokines is adiponectin, which is reduced with obesity, increases insulin resistance, dyslipidaemia and diabetes. (9). Adiponectin is a protein hormone that modulates a number of metabolic processes, including glucose regulation and fatty acid oxidation. It is exclusively secreted from adipose tissue (and also from the placenta in pregnancy). Levels of the hormones are inversely correlated with body fat percentage in adults,

While the association in infants and young children less clear. Transgenic mice with increased adiponectin show impaired adipocyte differentiation increased energy expenditure associated with protein uncoupling (10). The hormone plays a role in suppression of the metabolic derangements that may result in type-2 diabetes (11), obesity and atherosclerosis (12) non-alcoholic fatty liver disease and an independent risk factor for metabolic syndrome (13). Adiponectin in combination with leptin has been shown to completely reverse insulin resistance in mice (14) and automatically self associates into larger structures. Initially, these adiponectin molecules together and form hexamers or dodecamers. like the plasma concentration, the relative levels of the higher order structures are sexually dimorphic where females have increased proportions of the high molecular weight form may be the most biologically active form regarding glucose homeostatic (15). High molecular weight adiponectin was further found to be associated with a lower risk of diabetes with similar magnitude of association as total adiponectin.(16). However coronary artery diseases has been found to be positively associated with high molecular weight adiponectin, but not with low molecular adiponectin.

Diet with exercise has positive effect on adiponectin concentration, which is largely explained by a reduction in fat mass (20). A cute exercise increases adipos tissues intestinal adiponectin concentration in overweight and lean subjects with no major changes in plasma adiponectin concentration (18). Moderate and high intensity aerobic exercise increase the adiponectin concentration in middle aged obese men (19)

Aerobic exercise with diet significantly increases the insulin sensitivity and adiponectin distribution (20). Chronic exercise that improves fitness levels, increase insulin sensitivity and reduce body weight, will increase resting adiponectin level (21). Simpson and Maria (2008), moderate and high intensity exercise increases adiponectin level (22).

CONCLUSIONS

Regular exercise (low or high aerobic) can conquer the battle against obesity as well as safeguard against the health risks associated with obesity. Both high and low intensity aerobic exercise increases the adiponectin level than control. Between the exercises high intensity shows better effect on the increase of adiponectin level of middle aged obese men.

IMPLICATIONS

Aerobic exercise will be suggested to increase adiponectin production. In particular high intensity aerobic exercise is the most suitable and effective method to increase the adiponectin level of obese men/women. Further research is suggested with different exercise (aqua resistance, altitude etc..) to have better impact on adiponectin secretion.

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