



## EFFECT OF EXERCISE ON SERUM CHOLESTEROL

## Physical Education

**Dr. Srikanta Mishra**

Assistant Professor, Baliapal College of Physical Education, Baliapal, Balasore, Odisha

**Dr. Aloke Sen Barman\***

Assistant Professor, Department of Physical Education, Seva Bharati Mahavidyalaya, Kaggari, Jhargram. \*Corresponding Author

## ABSTRACT

High levels of cholesterol in the blood lead to atherosclerosis which may increase the risk of cardiovascular disease. The question is whether exercise may elicit any positive effects for reducing level of cholesterol or not. From this point of view, the present researcher was intending to investigate effect of 12 weeks' regular exercise on level of cholesterol. Total 30 residential subjects mean age ranged (19±1) years student of Baliapal College of Physical Education were taken randomly for this study. Six days/week conditioning (one hour/day) and two major games (total 3 hours/day) were practiced regularly. After 12 weeks it was found that mean cholesterol decreased to 118.03 mg. from 128.42 mg. There was 10.39% decrease in level of cholesterol ( $t = 4.132$ ) significantly. The liver is the main gland for cholesterol homeostasis maintenance. Mechanisms like biosynthesis, via 3-hydroxy-3-methylglutaryl coenzyme A reductase activity, uptake through low density lipoprotein receptors, and lipoprotein release in the blood, storage by esterification and degradation and conversion into bile acids. The main precursor of cholesterol synthesis is Acetyl-CoA which gives rise to hydroxyl methylglutaryl-CoA. Therefore, it may be concluded that exercise stimulates enzyme that help move cholesterol from the blood to the liver and from there, the cholesterol is converted into bile or excreted.

## KEYWORDS

Exercise - Level - Cholesterol

## INTRODUCTION:

In the technology based modern society no one wants to do physical work due advancement of technology in every field of work. Due to lack of physical involvement it is fact that obesity takes place. Not only lack of physical activity but also food habit ensures the obesity. Obesity is the main cause of increase of level of serum cholesterol which may causes various heart diseases. Various studies reveal that exercise may decrease the level of cholesterol positively. But there are no such studies found in case of normal people it is true or not. So many studies found that in case of obese patient exercise is fruitful with controlled intensity and volume. So, from this point of view the researcher intends to investigate whether the exercise with high intensity and volume of load is effective to reduce the level of serum cholesterol or not. **Review of related literature:** *Valsdottir TD et. al. (2019)* stated that "3-week Low carbohydrate high fat diet decreased fasting glucose, while glucose tolerance was not affected. Total cholesterol increased due to increase in low-density lipoprotein".<sup>1</sup> *Kim KB et. al. (2019)* observed that "the effect of exercise on total cholesterol was medium".<sup>2</sup>

*Woodward A et. al. (2019)* reported that "there was a favorable effect of exercise on total cholesterol".<sup>3</sup> *Cheng YJ et. Al. (2019)* found that "no statistically significant intergroup differences was found in the total cholesterol and they offered that low -intensity and no progressive exercise program may be practical".<sup>4</sup> *Fungwe TV et. al. (2019)* stated that "aerobic exercise may increase cardio-respiratory fitness in elder person".<sup>5</sup>

He *YY and Wang WR (2019)* concluded that "twelve weeks high intensity interval training may be effective intervention method to regulate serum lipids of dyslipidemia with  $\epsilon 3$  and  $\epsilon 4$  alleles".<sup>6</sup>

*Motalibi SA et. al. (2019)* showed that "a significant difference between the experimental and the waitlist group, total cholesterol after completing the low-cost physical activity. Exercise may be effective for decreasing chronic vascular disease risk factors among community dwelling elderly women".<sup>7</sup>

## Method:

Total 30 residential female students' age ranged (19±1) years were selected after randomization from 109 students of B.A. General pass course which divided into two groups BA-1 (N = 15) and BA-2 (N = 15) group. Six days/week conditioning (one hour/day) and two major games (three hours/day) were practiced.

## Procedure:

Total Cholesterol was measured through fasting blood test by using Hitachi 704 Analyzer.<sup>10</sup>

**Table No. 01. Practice Schedule Of BA - I Groups(Experimental).**

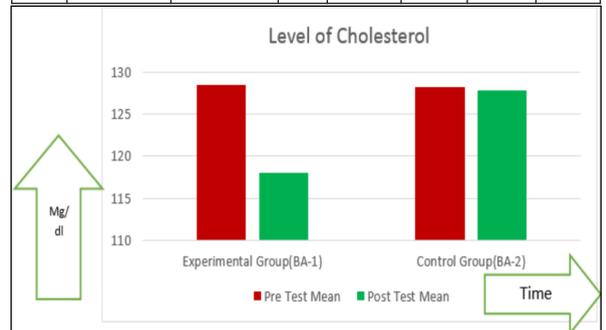
Conditioning	Activity -1 Athletics	Activity - 2 Ball Games	Activity -3 Any Games (own choice)
I hour (6.00 A.M. to 7.00 A.M.)	I hour (7.30 A.M. to 8.30 A.M.)	I hour (8.30 A.M. to 9.30 A.M.)	2 hour (6.00 A.M. to 7.00 A.M.)

## RESULT AND DISCUSSION:

After 12 weeks mean cholesterol decreased from 118.03 mg. from 128.42 mg which implies 10.39% decrease in level of cholesterol ( $t = 4.13274$  and  $p$  value 0.00010) in BA-1 and in case of BA-2 cholesterol level not decreased significantly from 128.21 to 127.84 which implies 0.0029% decrease in serum cholesterol ( $t = 0.1532$  and  $p$  value is 0.89). Though mechanisms of the effect of exercise on the lipid profile is not clear but it may be strong logic that exercise may enhance the ability of skeletal muscles to utilize lipids as opposed to glycogen and reducing plasma lipid levels. The increases in lecithin cholesterol acyl trans for ester transfer to high density lipoprotein cholesterol and increases in lipoprotein lipase activity may depend upon the energy expenditure during exercise were the mechanism behind decrease in total cholesterol.

**Table No. 02: Mean, S.D, T And P Value Of Serum Cholesterol**

Group	Pre Test Mean $\pm$ S.D	Post Test Mean $\pm$ S.D.	t	P Value	Significance Level	Test	% Decrease
BA-1	128.42 $\pm$ 4.5361	118.03 $\pm$ 4.6214	4.13 274	0.0001 0	0.05	Two tailed	10.39
BA-2	128.21 $\pm$ 6.0237	127.84 $\pm$ 6.3143	0.15 32	0.8921 4	0.05	Two tailed	0.0028 8



**Figure no. 1:** Comparison of mean Serum cholesterol of BA -1(Exp.) and BA-2(Cont.)

Ferguson et al. stated that 1,100 k Cal of energy expenditure is required for increases in high density lipoprotein cholesterol which depict significant increases in lipoprotein lipase activity. The process of cholesterol removal is called as “reverse cholesterol transport”. Aerobic exercise at high intensities was effective for improving the lipid profile. Increases in energy expenditure associated with aerobic exercise may positively influence lipoprotein lipase activity. In case of resistance training the increased volume of movement via increased numbers of sets and/or repetitions was a better impact upon the lipid profile than increased intensity.

#### CONCLUSION:

Cholesterol may be synthesized by cells and taken in through food intake. The liver is the main gland for cholesterol homeostasis maintenance by biosynthesis, *via* 3 – hydroxyl – 3 - methylglutaryl coenzyme A reductase activity, intake through LDL receptors, lipoprotein release in the blood, storage by esterification and degradation and conversion into bile acids.<sup>8</sup> The cholesterol synthesis was acetyl - CoA which gives rise to hydroxyl methylglutaryl - CoA. The rate limiting step in the cholesterol biosynthetic pathway is the conversion of HMG-CoA to mevalonic acid (MVA) by HMGR.<sup>9</sup> Therefore, it may be concluded that high intensity exercise with long duration may elicit a positive effect on level of cholesterol.

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