THE EFFECT OF MODERATE INTENSITY FUN AEROBIC GYM ON HDL-C AND LDL-C ON OVERWEIGHT WOMEN

Zanuar Bagus Saputro1, Tjitra Wardani2, Purwo Sri Rejeki1,2
1Sports Health Science, 2Department of Physiology, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Overweight and obesity is a major health problem in throughout the world. Hyperlipidemia and obesity are risk factor the occurrence of cardiovascular disease. Exercise is recommended as a therapeutic lifestyle changes because it leads to a variety of health benefits. Fun Aerobic gymnastics aerobics one which is quite popular in the community and a gym. Describe the gymnastics fun aerobic workout’s effectiveness against related to prevention of cardiovascular disease with seeing the results before and after doing gymnastics with the result of increasing levels of HDL-c and LDL/HDL Ratios as well as lowering LDL-c levels. Using design research one group pretest and posttest design with the subject as many as 19 people and given gymnastics moderate fun aerobic intensity for 45 minutes 3 day a week for 6 weeks. Gymnastics moderate fun aerobic intensity can increase HDL-c and LDL/HDL ratio and LDL-c. The paired t test results HDL-c pre test and post test (p = 0.000), LDL-c pre test and post test (p = 0.015), HDL/LDL Ratio (p = 0.000). Mean there are meaningful difference between the before and after of gymnastics. The effect of moderate intensity fun aerobic gym on the increase of HDL-c and LDL/HDL Ratio and a decrease in LDL-c in overweight women.

Keywords: Gymnastics fun aerobic; HDL; LDL; HDL/LDL ratio

INTRODUCTION

Overweight and obesity can cause the total of body fat and lipid profile in the blood rise, thus those suffering from overweight or obesity are prone to disease (Hardani & Lestariana, 2014). Obesity is a condition caused by the disruption of energy regulation and energy homeostasis. Regulation of the energy homeostasis in the human body is achieved through short term and long term mechanism. The short term mechanism includes the increasing amount of glucose, amino acid, fatty acid, and triglyceride level in blood along with the mechanical stretch in gastrointestinal tract (Rejeki, Argarini, & Subadi, 2016). It is recorded that the population aged beyond 18 years are 12.6% skinny and 21.7% are combination of overweight and obesity. The prevalence of overweight is relatively high on teenage girls than teenage boys (1.5% girls an 1.3% boys) (Kurdanti et al. 2015). The risk factors causing obesity on adult female according to Diana’s research in
intensity fun aerobic gym were conducted for 45 minutes 3 day a week for 6 weeks. And, the data collection for HDL-c and LDL-c post-test was taken the next morning after the treatment of fun aerobic gym had been conducted for 6 weeks and the subjects were asked to fast the night before taking the data.

The statistical analysis was done by using the 20.0 version of SPSS. The descriptive analysis test calculated the average value and also the deviation. After that, normality test was brought by using Shapiro-wilk. If the normality test results to normal data distribution, then parametric test would be done namely the paired t-test.

RESULTS

The descriptive analysis of subject characteristics described the average (mean) and standard intersection of age variable, weight, and IBM of the research subjects. Data are provided in Table 1. The Table 2 describes the average (mean) and standard intersection of HDL-c, LDL-c variables and the ratio of HDL/LDL during the fun aerobic gym. After descriptive test was conducted, the normality test was also done by using Saphiro-Wilk test that distributed normal data marked by value of \( p > 0.05 \). The analysis of paired t-test for HDL-c, LDL-c and the ratio of HDL/LDL showed that there are significant correlation of HDL-c variable \( (p > 0.05) \) with \( p = 0.000 \), while the LDL-c variable has significant correlation \( (p < 0.05) \) with \( p = 0.015 \) and the ratio of HDL/LDL has significant correlation \( (p < 0.05) \). The data is provided in Table 3.

Table 1. The mean and standard deviation values intersection of study subjects

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>19</td>
<td>22.00±1.59</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>19</td>
<td>157.47±5.243</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>19</td>
<td>59.84±3.962</td>
</tr>
<tr>
<td>BMI (Kg/m²)</td>
<td>19</td>
<td>24.10±0.59</td>
</tr>
<tr>
<td>Age (year)</td>
<td>19</td>
<td>22.00±1.59</td>
</tr>
</tbody>
</table>

Note: SD = Std deviation; BMI= body mass index; n= amount research subject

DISCUSSION

The treatment of fun aerobic gym with moderate intensity is a treatment by combining low and high impact movements in the main movements. The main activity includes the movements that are more active and discipline to train the particular body parts by enough repetition.
This activity follows the sequences that have been planned before, the chosen movements are assessed from the upper parts of the body to the lower parts of the body or from head, shoulders, arms, up to the combined movements. The implementation of the main activity moves progressively from single movement on the body up to the simultaneously body movement (Marta, Dinata 2007). Accord to Mann et al (2013) doing the moderate intensity resistance exercise 3 times in a week for 6 weeks can improve the level of HDL-c. The physical activity mechanism that can improve HDL level is Reverse Cholesterol Transport; it is a lipoprotein metabolism process. HDL returns cholesterol from LDL to heart to be resynthesized as bile acids (Murray, 2014). The improvement of HDL level can be mediated by lecithin-cholesterol acyltransferase (LCAT) enzyme. In some experiments, it was reported that there is improvement of LCAT after physical exercise which then can cause many certified cholesterol yang and transported to the main of HDL particle.

This allows HDL to bind the uncertified cholesterol on the surface and cause the improvement on HDL level (Pantouw et al 2014). Lipoprotein lipase helps to move LDL from blood to heart, then it will be changed into bile or secreted thus the LDL level decrease (Haryanto & Sayogo, 2013). The decrease of LDL cholesterol level is caused by the high content of unsaturated fatty acids (HDL) such as monosaturated fatty acids (oleic acid) and polyunsaturated fatty acids (linoleic acids). HDL can decrease the level of cholesterol by stimulating the change of cholesterol esters to become bile acids and excreted through bile duct. Moreover, it can improve the increase of LDL receptor formation, so the catabolism process of LDL in the blood can be immediately distributed to the tissue. HDL will also decrease the cholesterol level of blood plasma because HDL in the heart is not modified to become LDL and VLDL, but it tends to undergo an oxidation that produces bile acids.

**CONCLUSION**

Fun aerobic gym is one of the efforts to prevent cardiovascular diseases. The intensity of fun aerobic gym is on the moderate level, three treatments in a week for six weeks, this gym can increased the level of HDL-c, ratio HDL-c/LDL-c and decreased the level of LDL-c for women suffering from obesity.

**REFERENCES**


Kazeminasab F, Sc M, Marandi M, Ph D, Ghaedi K, Ph D (2017). Effects of a 4-week aerobic exercise on lipid profile and expression of LXR a in rat liver. Cell J 19, 45-49
Kelly RB (2010). Diet and exercise in the management of hyperlipidemia. Am Fam Physician 81, 1097-1102