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RESEARCH ARTICLE

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Both Acute and Chronic Exercise Decrease Total Cholesterol Level in Human Blood

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ABSTRACT

Exercise such as Diabetes dance of Persadia 1 is the evolvement of prior diabetes dance series with aerobic principle with more eccentric movement. Diabetes dance of Persadia 1 has been inspected effective for lowering fasting blood glucose, but its still unknown about its effect on blood level of total cholesterol. The aim of this research was to analyze the effect of exercise on total cholesterol level. This research was experimental study, with 16 subject of healthy housewives and divided on 2 groups, that were exercise and control group. Exercise group was given with diabetes dance of Persadia 1 while control group have the unstructured activity. Blood level of total cholesterol (TC) has been measured after 24 hours post single bout exercise (acute-AE) and repeated exercise (chronic exercise-CE). Paired t-test analysis on both acute (AC) ($p=0.005$) and chronic (CC) ($p=0.006$) shows TC decrease significantly on control group, as well as on AE ($p=0.001$) and CE ($p=0.001$). However, TC tend to increase on CC though not significantly increase ($p=0.916$), while on CE tend to decrease significantly ($p=0.041$). This study showed that both acute and cronic exercise decrease total cholesterol level in human blood.

Keywords: Interleukin-6, Total cholesterol level, Exercise

INTRODUCTION

Background

Exercise may improve whole body aspect, some of which is blood level of total cholesterol. Total cholesterol is cholesterol measurement which calculated of high density lipoprotein (HDL), low density lipoprotein (LDL), plus 20 percent of triglyceride (TG) level⁽¹⁾. Cholesterol play important role on human body system which is as component of plasma membrane, material of steroid hormone, and component of brain organ⁽²⁾. Low cholesterol level is not always a good things, especially if its to much low (cholesterol deplete). Cholesterol depletion leads to synaptic and dendritic spine degeneration, failed neurotransmission, and decreased synaptic plasticity⁽³⁾.

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Purpose

The aim of this research is to analyze the effect of exercise on total cholesterol level.

METHODS

This research was an experimental study designed with pre test and post test control group design. Experimental research, with 16 subject of healthy housewives who was participated and divided on 2 groups, that were exercise and control group. Exercise group was given with diabetes dance of Persadia 1 for 35 minutes, 3x per week for 2 weeks, while control group have the unstructured activity. Both control and exercise group already had their conditioning phase for 2 weeks before they start their training. Blood level of total cholesterol (TC) had

been measured from each subject after 24 hours post single bout exercise (acute-AE) and after repeated exercise (chronic exercise-CE) by vein puncture. Both exercise group and control already had their conditioning phase as long as 2 weeks before they start their training. Conditioning phase was the part of training programme to prevent any injury that possibly occur. In this conditioning phase, both control and exercise group had their unstructured activity including their daily activity and any of exercise which was conducted by them unschedully and unregularly. Blood sampel had been collected by professional medical personnel. TC was analyzed by spectrophotometer in collaboration with IRPTI Airlangga Health Science Institute laboratory.

RESULTS

Subject Characteristics

Subject of this research were 16 adult, health, obese housewifes from 25-45 years old. The largest percentage of age ranges was 25-28 years old, with body weight 65-70 kg, while for BMI, there was the same percentage for overweight and obese. Generally, subjects characteristics who was take part in these research are shown in table 1.

Table 1. Subjects characteristics

Variable	Mean	Standard deviation
Age	32.9375	5.83631
Weight	58.3125	8.34840
Body Mass Index (BMI)	24.1250	2.91833

Blood Level of Total Cholesterol After and Prior to Exercise

Blood sample of total cholesterol had been collected on pre exercise, after a single bout of exercise (acute), and after repeated exercise (chronic).

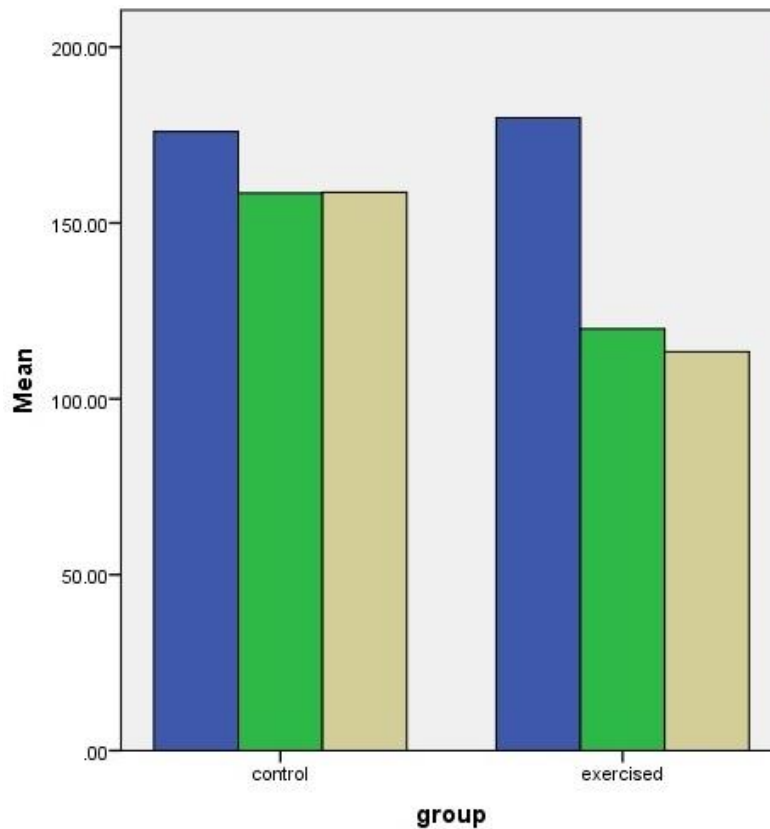


Figure 1. Blood level of Total Cholesterol

Paired t-test analysis on acute ($p=0.005$) and chronic control ($p=0.006$) group showed blood total cholesterol decrease significantly, as well as on acute exercise ($p=0.001$) and chronic exercise ($p=0.001$) group. However, blood total cholesterol tend to increase on chronic control group though not significantly increase ($p=0.916$), while on chronic exercise tend to decrease significantly ($p=0.041$).

DISCUSSION

Blood level of total cholesterol shows significant reduction especially on exercise group both acute and chronic exercise possibly caused by HDL improvement by doing Diabetes Dance of Persadia 1. As explained before, Diabetes Dance of Persadia 1 are aerobic exercise designed with more eccentric muscle movement. Wang&Xu (2017) shows HDL improvement on their post test result after doing aerobic exercise. Another study shows HDL improvement after 10 weeks aerobic exercise⁽⁴⁾, while Yfanti *et al.* (2017) shows HDL improvement after eccentric exercise though not significant⁽⁵⁾. HDL play an important role on cholesterol uptake from cell to hepar⁽²⁾, thus make blood level of total cholesterol decrease.

CONCLUSION

This study shows that exercise both acute and chronic exercise decrease total cholesterol level in human blood.

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