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Immediate and one week endurance exercise effect on platelet

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Abstract
Background: A growing body of recent research reports indicates that Platelet variables are influenced by immediate and regular exercise habits.
Aim of the Study: The specific aim of this study was to examine the immediate and one week endurance exercise effect on platelets.
Method: Subjects: For this study two male healthy, non smoker aged between 20-22 years were selected as subject.
Variables Studied: Platelet count was measured from the blood sample.
Exercise Protocol: After collecting the blood subjects were instructed to run continuously for 30minutes with moderate intensity.
Design of the Study: Before commencement of the one week endurance training, initially (pretest) basal level of Platelet was measured immediate and after the 30 minutes of continuous running. Again posttest sample were collected after one week of 30 minutes regular moderate endurance running.
Statistics: Data of subject 1 & 2 were reported in the form of mean and standard deviation.
Results: Mean value of platelet before one week was recorded as, initially 252.5 ± 0.60Lakh/cmm and after 30 minutes of endurance exercise 221 ± 0.49 Lakh/cmm. Finally, after one week of 30 minutes regular endurance running the mean values of platelet count was 220.5 ± 0.34 (pretest) and after posttest (30 minutes exercise) 206 ± 0.19 Lakh/cmm.
Conclusion: From this study it can be concluded that short term moderate exercise can change platelet count.

Keywords: exercise, platelet count

1. Introduction

Platelets, or thrombocytes are small, disk shaped cell fragments (i.e. cells that do not have a nucleus), 2–3 µm in diameter (smallest part of blood), the average lifespan of a platelet is normally just 5 to 9 days. Platelets are only about 20% of the diameter of red blood cells, the most numerous cell of the blood. The normal platelet count is 150,000-350,000 per micro liter of blood, but since platelets are so small, they make up just a tiny fraction of the blood volume. Disorders with low platelet counts are called thrombocytopenias and disorder with high platelet count are called thrombocytosis. The main function of platelets is to contribute to hemostasis. It is the process by which bleeding from an injured vessels is stopped. Hemostasis is a life saving process. If it is absent or even defective, one might bleed to death. Secondly the constriction of the bleeding vessels (vasoconstriction) which stop or decrease the flow. Platelets are also involved in repair of damaged endothelium by being deposited on the damage site and thus making a smooth layer on the intima. The platelet phagocytose antigen-antibody complexes which play important role in inflammation by coagulating the exudates and thereby localizing the microbes which then cannot spread [1].

Scientific evidence indicates that both acute exercise and habitual physical activity affect platelet function. This is of special interest as the inflammatory and immunomodulatory consequences of platelet activation are increasingly recognized and platelets therefore seem to be of central importance not only to the final stages of cardiovascular disease, but also to the development of platelet related diseases [2]. Therefore, a modulation of platelet function by acute exercise and/or habitual physical activity might represent a mechanistic link between physical exertion and its observed effects on general health. Effects of exercise on platelet function show obvious similarities to the well-recognized relation between exercise and the risk for cardiovascular events where vigorous exercise transiently increases the risk for myocardial infarction and a physically active lifestyle dramatically reduces cardiovascular mortality [3].

Pathological and clinical studies have suggested that platelets play an important role in the pathogenesis and progression of cardiovascular diseases. It has also been postulated that regular exercise may reduce the risk of major vascular thrombotic events and protect us against cardiovascular diseases [4].

The purpose of this study was to determine the immediate and one week short term endurance exercise effect on platelet count.

2. Methodology

Subjects: Complete planning of the study and experimental

protocol had previously been reviewed and approved by a physician for the safety of human subjects. Two physically active men who were young and healthy aged between 20-22 years were voluntarily participated in the present study. Objective of the study and details of study protocol were explained to the subjects and individual consent was taken from the subject subsequently. None of the subjects had history of any medical or surgical illness.

Exercise Protocol: At the very outset subjects were arrived at the laboratory and rested for 30 minutes, blood sample was drawn from a forearm vein. After collecting the blood subjects were instructed to run continuously for 30minutes with moderate intensity.

Design of the Study: Before commencement of the immediate and one week endurance training, initially (pretest) basal level of platelet was measured and immediately after the 30 minutes of continuous running. Again posttest sample were collected after one week of 30 minutes regular moderate endurance running.

Statistical Analysis: All the data of subject 1 & 2 were reported in the form of mean and standard deviation.

3. Results

Initial mean value of platelet before one week was recorded as 252.5 ± 0.60 Lakh/cmm and after 30 minutes of endurance exercise it was 221 ± 0.49 Lakh/cmm. Finally, after one week of 30 minutes regular endurance running the mean values of platelet count were recorded as 220.5 ± 0.34 (pretest) and after 30 minutes exercise (posttest) it was 206 ± 0.19 Lakh/cmm

Table 1: Immediate and One Week Endurance Exercise Effect on Platelet Count

	Immediate Endurance Exercise Training Effect		One Week Moderate Endurance Training Effect	
	Pre Ex. (Lakh/cmm)	Post Ex. (Lakh/cmm)	Pre Ex. (Lakh/cmm)	Post Ex. (Lakh/cmm)
Subject-1	2,10,000	1,86,000	1,96,000	1,92,000
Subject-2	2,95,000	2,56,000	2,45,000	2,20,000
Mean	252.5	221.0	220.5	206
SD	0.60	0.49	0.34	0.19

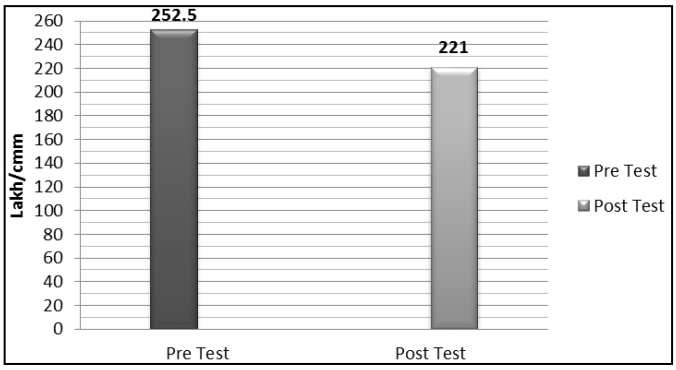

Fig 1: Graphical Presentation of the Immediate Effect of Exercise on Platelet Count

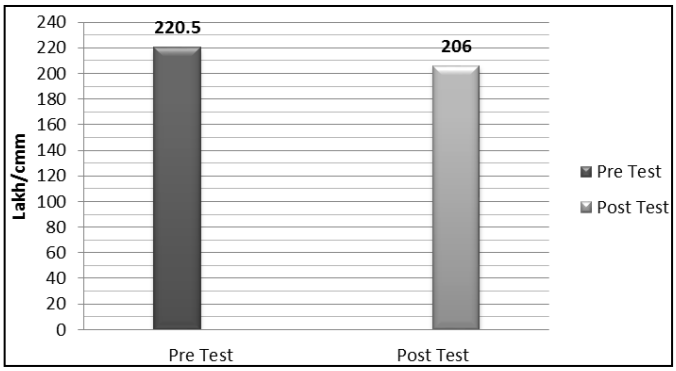

Fig 2: Graphical Presentation of the One Week Short Term Endurance Exercise Effect on Platelet Count

4. Discussion

The findings of this study support that immediate and one week endurance exercise lead to decrease platelet count from pre-test to post-test mean value of young healthy subjects.

The fact that exercise is beneficial to health is accepted by many researchers. Large number of studies has documented the beneficial effects of exercise on various aspects of platelet such as platelet count, mean platelet volume, platelet distribution width, platelet aggregation, adhesion, platelet factor-4, bleeding time, clotting time, platelet and immune system, platelet and cardiovascular disease etc. [5-7].

In the present study it is observed from the mean value that platelet was decrease after immediate and one week of short term moderate endurance training from pre to post test value. There are studies which indicate a similar pattern of changes in the platelet value after exercise.

In a study Saloan *et al*. shows that platelet count fell significantly between the control and experimental group after a short period of moderate exercise, on standing up and on lying down [8].

5. Conclusions

From this pilot study it can be concluded that exercise has an effect on the platelets function though it needs more in depth study to reach a specific logical conclusion.

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