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Hematological parameters of active sedentary and yoga practitioner: An analytical study on middle aged women

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Abstract
The purpose of the study was to compare the hematological parameters of active sedentary and yoga practitioner: an analytical study on middle aged women. Researcher had selected total Forty five (45) middle aged women as subjects. The aim was to study the hematological parameters of active sedentary and yoga practitioner middle aged women. The variables selected for the study were erythrocytes and thrombocytes. The data was analyzed to find out the significant difference between the groups. ANOVA test statistical technique was used to analyze the significant difference and the level of significance was set at 0.05 level.

Keywords: Erythrocytes, thrombocytes, active, sedentary

Introduction

Exercise plays a major role in improving the quality and most likely the longevity of our lives. Most people who exercise regularly will agree that one of the main reasons for their exercise is that it makes them feel good, and help them to attain or maintain good health and physical fitness. The effect of regular physical activity significantly improves health, physical fitness and work capacity and enables people to use their leisure time more beneficially and thereby assists in adding life to years and also years to lives. Ageing and ultimate death seem characteristic of all living organisms. Atherosclerosis and arteriosclerosis progressively decrease the tissue oxygen supply, and in some organs such as the brain, cells that die are not replaced. In other tissues, the cell constituents change with ageing; for example, cross linkages develop between adjacent collagen fibrils, decreasing their elasticity and facilitating mechanical injury. In consequence, most biological functions show a progressive, age-related deterioration.

The world health organization has defined "health" as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (World Health Organization, 1948) [5]. It is of value to think of health as the condition of the individual that makes possible enjoyment of life, the greatest constructive work and that shows a self as the best service to the world. It involves keeping the body and mind at highest levels, living at one's best and not being satisfied with more absence from hospital or the sick room. Health is of significance in proportion as it denotes condition of the whole organism expressing its function in joyous play, satisfactory to work and needed service to others. Health may therefore be defined as the quality of life that renders the individual "to live most and serve best" (Raghavan, 1983) [3].

Hematology refers to the study of the numbers and morphology of the cellular elements of the blood – the red cells (erythrocytes), white cells (leucocytes), and the platelets (thrombocytes) and the use of these results in the diagnosis and monitoring of disease (Merck Manual, 2012) [2].

Erythrocytes also called Red blood cells or RBC are known for their bright red color, red cells are the most abundant cell in the blood, accounting for about 40-45 percent of its volume. Production of red blood cells is controlled by erythropoietin, a hormone produced primarily by the kidneys. Red blood cells start as immature cells in the bone marrow and after approximately seven days of maturation are released into the bloodstream. Unlike many other cells, red blood cells have no nucleus and can easily change shape, helping them fit through the various blood vessels in your body. However, while the lack of a nucleus makes a red

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blood cell more flexible, it also limits the life of the cell as it travels through the smallest blood vessels, damaging the cell's membranes and depleting its energy supplies. The red blood cell survives on average only 120 days. Red cells contain a special protein called hemoglobin, which helps carry oxygen from the lungs to the rest of the body and then returns carbon dioxide from the body to the lungs so it can be exhaled.

Leukocytes, or White blood cells also spelled "leucocytes", are the cells of the immune system that are involved in defending the body against both infectious disease and foreign materials. Leukocytes are found throughout the body. The number of leukocytes in the blood is often an indicator of disease. Concentrations average of white blood cell is 3.3-8.7 thousands per cubic milliliter of blood. They make up approximately 1% of the total blood volume in a healthy adult. An increase in the number of leukocytes over the upper limits is called leukocytosis, and a decrease below the lower limit is called leucopenia. (American Society of Hematology, 2013) [1] Thrombocytes also called platelets. Unlike red and white blood cells, platelets are not actually cells but rather small fragments of cells. Platelets are only about 20% of the diameter of red blood cells, the most numerous cell of the blood. Platelets help the blood clotting process or coagulation by gathering at the site of an injury, sticking to the lining of the injured blood vessel, and forming a platform on which blood coagulation can occur. This results in the formation of a fibrin clot, which covers the wound and prevents blood from leaking out. Fibrin also forms the initial scaffolding upon which new tissue forms, thus promoting healing.

Objective
The objective of the study was to compare the hematological parameters of active sedentary and yoga practitioner middle aged women.

Hypothesis
There will be insignificant difference of hematological parameters of active sedentary and yoga practitioner middle aged women.

Material & Methods
Selection of Subjects: - Total Forty five (45) middle aged women were selected as subjects. They were divided into three groups named: active, sedentary and yoga practitioner. Each group had fifteen (15) subjects.

Selection of variables:-The following two biochemical parameters were selected for the purpose of this research.
1. Erythrocytes
2. Thrombocytes

Statistical Procedure
After the collection of relevant data, to compare the selected biochemical parameters of active, sedentary and yoga practitioner middle aged women. ANOVA test was employed with the help of Statistical package for the social sciences (SPSS). The level of significance was set at 0.05.

Analysis of data and results

Table 1: Means and SDs of Cortisol hormone and Thyroid hormone of active, sedentary and yoga practitioner middle aged women

Variable	Group	Mean	S.D.
Erythrocytes	Active	4.119	0.283
	Sedentary	4.350	0.214
	Yoga practitioner	4.397	0.295
Thrombocytes	Active	2.089	0.155
	Sedentary	2.159	0.154
	Yoga practitioner	2.253	0.171

Level of Significance .05

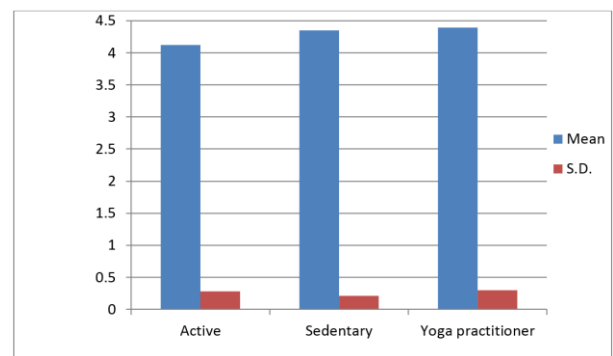**Fig 1:** Comparison of Mean difference of Erythrocytes of active, sedentary and yoga practitioner middle aged women
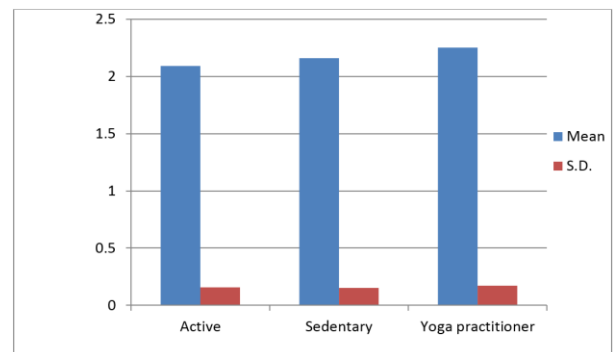

Fig 3: Comparison of Mean difference of Thrombocytes of active, sedentary and yoga practitioner middle aged women

Table 2: Analysis of variance (ANOVA) results of erythrocytes among active, sedentary and yoga practitioner middle aged women

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	F-value	P-value (Sig.)
Between Group	.661	2	.331	4.659	.015
Within Group	2.982	42	.071		
Total	3.643	44			

*Significant at 0.05

Table 2.1: Multiple Comparison of erythrocytes among active, sedentary and yoga practitioner middle aged women

(1) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Active	Sedentary	-.23067*	.09729	.022	-.4270	-.0343
	Yoga practitioner	-.27733*	.09729	.007	-.4737	-.0810
Sedentary	Active	.23067*	.09729	.022	.0343	.4270
	Yoga practitioner	-.04667	.09729	.634	-.2430	.1497
Yoga practitioner	Active	.27733*	.09729	.007	.0810	.4737
	Sedentary	.04667	.09729	.634	-.1497	.2430

*The mean difference is significant at the 0.05 level.

Table 3: Analysis of variance (ANOVA) results of thrombocytes among active, sedentary and yoga practitioner middle aged women

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	F-value	P-value (Sig.)
Between Group	.205	2	.102		
Within Group	1.075	42	.026	4.001	.026
Total	1.280	44			

*Significant at 0.05

Table 4: Multiple Comparison of thrombocytes among active, sedentary and yoga practitioner middle aged women

(1) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Active	Sedentary	-.07000	.05843	.238	-.1879	.0479
Active	Yoga practitioner	-.16467*	.05843	.007	-.2826	-.0468
Sedentary	Active	.07000	.05843	.238	-.0479	.1879
Sedentary	Yoga practitioner	-.9467	.05843	.113	-.2126	.0232
Yoga practitioner	Active	-.16467*	.05843	.007	.0468	.2826
Yoga practitioner	Sedentary	.09467	.05843	.113	-.0232	.2126

*The mean difference is significant at the 0.05 level.

Discussion and Findings

The results showed the significant difference in erythrocytes and thrombocytes among active, sedentary and yoga practitioner middle aged women. As we can observed from the given results that Yoga practitioner women had highest numbers of erythrocytes and thrombocytes than other groups. So the hypothesis is rejected for erythrocytes and thrombocytes. The results of (Sahaya Latha Rani, 2012) [4] supported the study.

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