

A Comparative Study of Hematological Variables between Basketball Players and Yoga Practitioners

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Abstract

Basketball is a popular court-based team sport that has been extensively studied over the last decade. Yoga is a physical and mental discipline that forms part of ayurvedic medicine. The purpose of the study was to find out hematological variables (RBC, WBC, and Platelets) between regular basketball players and yoga practitioners. Nine (09) subjects were randomly participated as volunteers in this study; among them (n=04) were basketball players and the rest (n=05) yoga practitioners. Blood samples were collected in the morning session (6:30 a.m. to 7:30 a.m.) with fasting. Red blood cells (counts), white blood cells (counts), and platelets (counts) were criterion measures in this study. The data were analyzed using descriptive statistics, mean and SD and an unpaired t-test were applied to check the level of significance ($p < 0.05$). Statistical results indicated that the monocytes and platelets were statistically significant differences found between basketball players and yoga practitioners. There was no statistically significant difference in red blood cell, neutrophil, eosinophil, basophil, lymphocytes between the two groups. In summary, it could be said that basketball players' monocytes and platelets blood count were higher than yoga practitioners, but red blood cell, neutrophil, eosinophil, basophil, lymphocytes blood count is closer in both groups.

Keywords: Basketball Players, Yoga Practitioners, Haematology, Monocytes, Platelet.

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INTRODUCTION

Basketball is a court sport that works every muscle in the body while also improving mental reflexes. It necessitates a high level of physical resilience [1, 2]. As one of the most physically challenging sports, it fosters a wide range of athletic abilities in players. It entails the offensive and defensive skills of passing and throwing the ball, changing paths quickly with abrupt stops, jumping, and maneuvering the opponent [3, 4]. There are a variety of techniques that can be used to boost basketball free-throw shooting [5]. However, mental visualization preparation may help improve free-throw shooting accuracy [6]. On the other hand, physical fitness is a success trait defined by its ability to be measured with closed tests and basketball players can assess by these tests [7, 8]. Basketball is, in reality, defined as an intermittent sport in which the highest intensity in which the activities occur currently stands out, requiring the optimal and homogeneous creation of physical, technical, tactical, psychological, and intellectual components for sports success [9]. Players must have an optimal physiological function to perform these skill tests [10]. Since the

auditory and visual reaction time basketball players took mastery over the non-athletes group [11]. Therefore present author possibly believe that basketball players hematology test score may be better than the non-contact stationary sports. Yogic intervention is one kind of stationary non-contact sports that is why the subjects were taken from this group in the present study.

Hematology is the study of blood, specifically how blood affects overall health and disease. Hematology studies examine the blood, blood proteins, and organs that produce blood. Infection, anemia, inflammation, hemophilia, blood-clotting disorders, leukemia, and the body's reaction to chemotherapy therapies are all diseases that can be evaluated with these tests [12]. Similarly, blood problems can affect a variety of body systems, including the lymphatic system, which is a network of tissues and organs that removes waste. Problems with the bone marrow, which produces the majority of the body's blood cells, may cause blood disorders [13].

Yoga is an ancient discipline that consists of physical postures as well as breathing and meditation techniques. Yoga's physiologic results have been scientifically proven [14]. According to one study, yoga interventions were effective in lowering depression levels [15]. As a result, there has been an increase in studies in the area of non-pharmacological intervention in the treatment of mental illnesses [16]. On the other hand, exercise is regarded as a safe and effective way to improve and preserve physical and mental health. Yoga improves physical and mental wellbeing by down-regulating the hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic nervous system, according to a growing body of evidence (SNS) [17]. Yogic treatment is highly demanding at present to maintain physical and mental health. Therefore, participants' emotional and physical relaxation can be improved by versatility [18]

Finally, several studies have shown that basketball games and yogic practice ensure the keeping body healthy and fit. Now the present author wishes to compare the hematological variable between regular basketball players and yoga practitioners.

Aim of the Study

The study aimed to compare hematological variables between regular basketball players and yoga practitioners.

Objectives

To compare red blood cells (RBC) counts of the university level men regular basketball players and yogic practitioners.

To compare white blood cells (WBC) counts of the university level men regular basketball players and yogic practitioners.

To compare platelets counts of the university level men regular basketball players and regular yogic practitioners.

Participants

The study was delimited with four university-level men basketball players from the Department of Physical Education and Sport Science, and five regular yoga practitioners from the Department of Yogic Art and Science, Visva-Bharati University, Santiniketan, West Bengal, India. The age of the subjects ranged between 20-25 years. In this study, seven hematological parameters were considered as dependent variables. All the subjects participated in the university level competition and willing to be a part of this study.

Table-1: The characteristics of the participants (Mean \pm SD)

Sl. No	Items	Basketball Players (n=04)	Yoga Practitioners (n=05)
1	Age (yr)	22.50 \pm 2.38	22.60 \pm 1.52
2	Weight (kg)	67.75 \pm 4.50	56.60 \pm 7.37
3	Height (m)	1.72 \pm 0.08	1.68 \pm 0.06
4	BMI (kg/m ²)	22.85 \pm 0.84	19.98 \pm 2.12

Selection of Variables

In this study, seven blood cell parameters were selected: Red Blood Cell (RBC), White Blood Cell

(WBC): Neutrophil, Eosinophil, Basophil, Lymphocyte, Monocyte, and Platelet.

Hematological parameters are presented in the Table-2.

Table-2: Hematological Parameters

Sl. No	Blood Parameters	
1	Red blood cell	RBC
2	Neutrophil	WBC
3	Eosinophil	
4	Basophil	
5	Lymphocytes	
6	Monocytes	
7	Platelet	

Data Collection

The present investigator studied some hematological variables: red blood cell, white blood cell, and platelet. The investigator selected four university-level basketball players purposively selected from the Department of Physical Education and sport science, and five university-level yoga practitioners from the Department of Yogic Art and Science. Vinaya Bhavana, Visva-Bharati University, Santiniketan, West Bengal, India. Collecting the final data by reputed pathological laboratory (New Nirikshan Pathological

Laboratory, Sian, Bolpur, Birbhum, West Bengal, India) was collecting blood samples with their label container. On the final data collection day, all the subjects were asked to sit quietly for 10 minutes and then an initial blood sample was collected in the container. The entire blood samples were sent to the pathological laboratory for analysis. The results were collected after three days in a printed format with their letterhead and seal.

Criterion Measures and Procedure for Data Collection

In the morning session (6:30 a.m. to 7:30 a.m.) with fasting, blood samples were collected in the marked sterilized container. All the blood samples were

collected by a qualified laboratory technician for analysis with specific scientific laboratory methods. Blood cell routine examination method is presented in the Table-3.

Table-3: Blood Routine Examination Test

Sl. No	Parameters	Methods
1	Red blood cell	In counts (million/c.mm)
2	Neutrophil	In counts /c.mm
3	Eosinophil	In counts /c.mm
4	Basophil	In counts /c.mm
5	Lymphocytes	In counts /c.mm
6	Monocytes	In counts /c.mm
7	Platelet	In counts (Lakhs/c.mm)

Statistical Procedures

In this study, mean, standard deviation (SD), and unpaired t-test were calculated by the SPSS software.

FINDINGS

In this area, the researcher presented the calculated result of mean, SD and unpaired t-test of all blood parameters of university level basketball players and yoga practitioners.

Table-4: Unpaired t-test of blood parameters between basketball players and yoga practitioners

Parameters		Basketball Players		Yoga Practitioners		Inferential: Unpaired Sample t-test		
		Mean	SD	Mean	SD	t	df	Sig. (2-tailed)
Red Blood Cell (RBC)		4.65 mill./cu.mm	0.37 mill./cu.mm	4.58 mill./cu.mm	0.08 mill./cu.mm	0.42	7	0.687
White Blood Cell (WBC)	Neutrophil	5431.25 cu.mm	427.22 cu.mm	4382.4 cu.mm	843.48 cu.mm	2.25	7	0.059
	Eosinophil	199.00 cu.mm	47.71 cu.mm	271.60 cu.mm	44.46 cu.mm	2.36	7	0.050
	Basophil	0.00 cu.mm	0.00 cu.mm	0.00 cu.mm	0.00 cu.mm	0.00	7	1.000
	Lymphocytes	2440.25 cu.mm	221.53 cu.mm	2493.80 cu.mm	505.51 cu.mm	0.92	7	0.388
	Monocytes	79.50 cu.mm	2.38 cu.mm	72.20 cu.mm	5.02 cu.mm	2.65	7	0.033
Platelets		3.70 lac/cu.mm	0.34 lac/cu.mm	2.18 lac/cu.mm	0.19 lac/cu.mm	8.58	7	0.000

Significance level at 07 df at 0.05 level = 2.36

Table: 4 of unpaired sample t-test of blood parameters between basketball players and yoga practitioners shows that red blood cell (RBC) of basketball players mean = 4.65 mill./cu.mm, SD = 0.37 mill./cu.mm, and yoga practitioners mean = 4.58 mill./cu.mm, SD = 0.08 mill./cu.mm, with $t_{(0.05)}(7) = 0.42$ and $p = 0.687$ (2-tailed) is statistically not significant. Neutrophil (WBC) of basketball players mean = 5431.25 cu.mm, SD = 427.22 cu.mm, and yoga practitioners mean = 4382.4 cu.mm, SD = 843.48 cu.mm, with $t_{(0.05)}(7) = 2.25$ and $p = 0.059$ (2-tailed) is statistically not significant. Eosinophil (WBC) of basketball players mean = 199.00 cu.mm, SD = 47.71 cu.mm, and yoga practitioners mean = 271.60 cu.mm, SD = 44.46 cu.mm, with $t_{(0.05)}(7) = 2.36$ and $p = 0.050$ (2-tailed) is statistically not significant. Basophil

(WBC) of basketball players mean = 0.00 cu.mm, SD = 0.00 cu.mm, and yoga practitioners mean = 0.00 cu.mm, SD = 0.00 cu.mm, with $t_{(0.05)}(7) = 0.00$ and $p = 1.000$ (2-tailed) is statistically not significant. Lymphocytes (WBC) of basketball players mean = 2440.25 cu.mm, SD = 221.53 cu.mm, and yoga practitioners mean = 2493.80 cu.mm, SD = 505.51 cu.mm, with $t_{(0.05)}(7) = 0.92$ and $p = 0.388$ (2-tailed) is statistically not significant. Monocytes (WBC) of basketball players mean = 79.50 cu.mm, SD = 2.38 cu.mm, and yoga practitioners mean = 72.20 cu.mm, SD = 5.02 cu.mm, with $t_{(0.05)}(7) = 2.65$ and $p = 0.033$ (2-tailed) is statistically significant. Platelets of basketball players mean = 3.70 lac/cu.mm, SD = 0.34 lac/cu.mm, and yoga practitioners mean = 2.18

lac/cu.mm, SD = 0.19 lac/cu.mm, with $t_{(0.05)}(7) = 8.58$ and $p = 0.000$ (2-tailed) is statistically significant.

DISCUSSION AND CONCLUSION

This study can add to the understanding of hematological parameters and provide insight into individual differences in these parameters. This research, on the other hand, will provide some information about the hematological parameters of basketball players and yoga practitioners. According to one yoga-specific hematological study, regular yoga practice causes changes in basic hematological parameters [19]. On the other hand, according to a basketball-specific hematological analysis, combined conditioning plays an important role in physiological and hematological adaptation processes, as well as the enhancement of athletic success. While this form of training is prescribed, it must be combined with regular biochemical blood testing to maintain a balance between exercise stress and rehabilitation strategies [20]. The current study aimed to find out how basketball players and yogic practitioners compare in terms of different hematological variables. After statistical analysis, it was discovered that, with the exception of eosinophil and lymphocytes, most hematological parameters have higher mean counts in basketball players than in yoga practitioners. Statistical results also indicated that the monocytes and platelets were statistically significant differences found between basketball players and yoga practitioners. This statistical difference was the main highlighted result. To summarize the current study, basketball players' monocytes and platelet counts were higher than yoga practitioners', but the population's red blood cell, neutrophil, eosinophil, basophil, and lymphocyte counts were nearly identical.

Limitation

The size of the samples should be larger.

Funding

Nil.

Conflicts of Interest

No conflicts of interest are declared by the author.

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