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Comparative analysis of erythrocyte and hemoglobin of female gymnasts and sedentary females

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Abstract

The purpose of the study was to compare the erythrocyte and hemoglobin characteristics of female gymnasts and sedentary females. This study was conducted with total forty (N=40) subject in the age group of 18-25 years. 20 best female gymnasts from different universities, who participated in All India Inter University Gymnastics Championship, were taken as subjects and equal number of females who did not participate in any sports activities considered as sedentary females. Purposive sampling technique was applied to select the sample. Hematological parameters i.e. Erythrocyte and Hemoglobin were selected for this study. To collect the data's in the selected variables the standardized hematology analyzer cell counter machine was used to analysis for data. The 't' test was applied to determine the significance of differences in means of the selected variables between female gymnasts and control group. The result of the investigation has shown that there was no significant difference in erythrocyte and hemoglobin parameters between gymnasts and sedentary female group. The level of significance for the study was fixed at 0.05.

Keywords: Erythrocyte, hemoglobin, gymnast, sedentary

Introduction

Sports and games have gained enormous popularity in perspective on the logical association and have turned into an overall wonder. Competition in games and particular physical education consists of different kinds of training and different tricks which create team unity necessary for reaching eventual training goals and tasks. In competitive sports, every factor has its own bearing on the performance of the player. Women artistic gymnastics consist of variety of skills on different apparatus. As a sport it is the supreme test of ability. Rampatti (1960) [6] reached the conclusion that from physiological stand point of view stamina is question of body capacity to consume oxygen. Thus, hemoglobin value is of immense significance in athletic performance. A protein called hemoglobin, which is found in red blood cells, carries most of the oxygen in the blood. Hemoglobin can bind oxygen and/or carbon dioxide; the amount of oxygen bound to hemoglobin is determined by the oxygen. Devries (1967) [3] also recommended that physical conditioning can increase the total hemoglobin concentration in blood but were no significant difference was observed among gymnasts, badminton player and swimmer in the study conducted by Devries. Every one of the subjects was having just 14-14.5 gm/100ml. hemoglobin in the study. The intense exercise in these games did not create any difference. Sport is a significant element of physical education and an overall awesome sight today. Life is characterized by movement and it is very important that all parts of the body should be practiced day by day.

In the present study an attempt has been made to compare the erythrocyte and hemoglobin parameters between female gymnasts and sedentary females.

Material and Method

To study the erythrocyte and hemoglobin parameters between female gymnasts and sedentary females total forty (N=40) subjects were selected in the age ranges between 18-25 years. 20 best gymnasts from different universities, who participated in All India Inter University Gymnastics Championship, were taken as subjects and equal number of females who did not participate in any sports activities considered as sedentary females.

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Venous blood samples were drawn in the morning, after an overnight fast and at least 12 hr following the last workout. Erythrocyte and Hemoglobin was assessed by using hematology analyzer cell counter machine by expert lab technician. The ‘t’ test was applied to determine the significance of differences in means of the selected variables between female gymnasts and control group. The level of

significance 0.05 was fixed to test the significance, which was considered as appropriate.

Analysis of Data

Descriptive statistics of erythrocyte and hemoglobin of female gymnasts and sedentary females have been depicted in table-1

Table 1: Descriptive Statistics of Erythrocyte and Hemoglobin of Female Gymnasts and Sedentary Females

Variables	Groups	N	Mean	Standard Deviation	Standard Error
Erythrocyte	Gymnast	20	4.567	0.367	0.082
	Sedentary	20	4.497	0.327	0.073
Hemoglobin	Gymnast	20	12.200	0.640	0.143
	Sedentary	20	12.395	0.806	0.180

*Significant at 0.05 level, Degree of freedom= 38

Table 2: Significance of Mean Differences in Erythrocyte and Hemoglobin between Female Gymnasts and Sedentary Females

Variables	Groups	Mean ±SD	MD	SED	‘t’ value
Erythrocyte	Gymnast	4.56±0.367	0.07	0.110	0.631
	Sedentary	4.49±0.327			
Hemoglobin	Gymnast	12.20±0.640	-0.19	0.230	0.847
	Sedentary	12.39±0.806			

*Significant at 0.05 level, Degree of freedom= 38

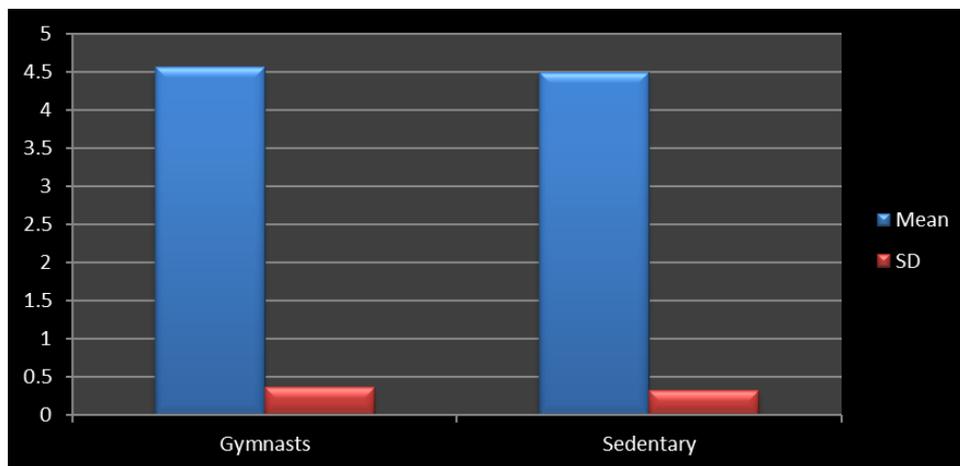


Fig 1: Comparison of Mean difference of Erythrocyte of Female Gymnasts and Sedentary Females

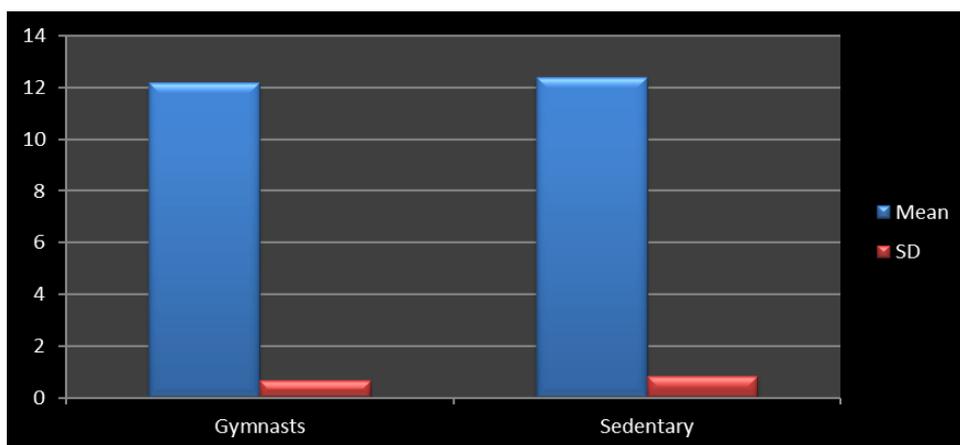


Fig 2: Comparison of Mean difference of Hemoglobin of Female Gymnasts and sedentary females

Results

Table -1 presents the descriptive statistics mean value and SD value and Standard Error as 4.56±0.367 and 0.082 in female gymnasts, whereas 4.49±0.327 and 0.073 in sedentary females on their erythrocyte and hemoglobin variables.

Table – 2 presents ‘t’ test for the mean difference of erythrocyte between female gymnasts and control group

(0.07), hemoglobin level between female gymnasts and control group (-0.19). The ‘t’ value 0.631 in erythrocyte and 0.847 in hemoglobin as shown in the table above indicate insignificant difference between female gymnasts and control group. The comparison of mean difference has been graphically presented in figure- 1 and figure-2.

Discussion on Findings

Based on the results of the study, the following findings were drawn: As the comparisons were made between female gymnasts and control group, it was concluded that there was no significant difference found in erythrocyte and hemoglobin values. The findings of the study revealed lower hemoglobin content in gymnasts than the sedentary group, whereas, erythrocyte value is higher in female gymnasts than the sedentary group. Lippi *et al.* (2005) ^[4] also support the findings of the present study as they found no significant increase portion of HB, RBC and HCT when athletes were compared with ordinary people. Boyasjiev *et al.* (2000) ^[1] found decreased values of RBC count, haemoglobin content and packed cell volume in athletes (highly trained persons) when compared with those of control subjects. A study conducted by Consatntini, *et al* (2000) ^[2] on the iron status of male and female gymnasts and compared it with other sports persons showed that iron store were consistently lower in male gymnasts than non gymnasts and no change in red cell count with less haemoglobin content in the experimental group.

Conclusion

It can be concluded that long duration activities, events and endurance sports reduces the erythrocyte and hemoglobin count.

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