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Comparison of hematological variables between short and middle distance runners

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Abstract

The aim of this study was to compare the selected hematological variables between short and middle distance male runners. For this purpose, a sample of one hundred & twenty (N=120) male athletes of 18-25 years of age, which includes short distance runners (N₁=60) and middle distance runners (N₂=60), were selected as subjects, from All India Inter-University Athletics Championships. All the participants were informed about the aim and methodology of the study and they volunteered to participate in this study. All the participants were assessed for selected hematological variables i.e. Blood Glucose, Blood Urea, HDL Cholesterol and LDL Cholesterol. All the subjects were examined in Pathological Lab and blood sample were taken by the certified expert of the medical field. The independent samples t-test was applied to assess the differences between selected hematological variables between short and middle distance male runners. The level of significance was set at 0.05. Results revealed significant differences between short and middle distance male runners with regard to Blood Urea (7.457) and LDL Cholesterol (10.548) whereas insignificant differences have been found with regard to Blood Glucose and HDL Cholesterol.

Keywords: Hematological variables, blood glucose, blood urea, HDL cholesterol, LDL cholesterol

Introduction

With the aim of enhancing performance in sports, researchers all over the world are engaged in scientific sports research as never before. May it be morphological, physiological parameters, hematological variables, sociological aspects and many more; the main aim is to produce certain principles which can be beneficial to break the barriers in performance in sports that has presently reached a plateau. Gaurav, V. *et al.* (2015) ^[2, 3] revealed in their study that there were significant differences in body weight, body mass index, systolic and diastolic blood pressure between urban and rural boys. Recently, it is found that physical performance may be affected by hematological parameters (Schumacher *et al.*, 2002) ^[9]. Gaurav, V. *et al.* (2015) ^[2, 3] also revealed that there were no significant differences in resting heart rate between trained and untrained basketball players. But a very low attention has been given by professional as well as the athletics players to these selected parameters i.e. blood glucose, blood urea, hdl cholesterol, ldl cholesterol. The stability and performance of the athletes depends upon good health and hematologic status. Biochemical and hematological indices are usually used to monitor athletes for calculating performance status and pathologies (Dolci *et al.*, 2007) ^[1]. However in case of younger players, the tempo and timing of changes in body functional capacities, size and motor efficiency during puberty make the evaluation complicated (Malina *et al.*, 2004) ^[6]. Training now involves specificity of these components as well as the health components that are directly responsible for preparation and participation in the sport one chooses to compete in. Once you are seriously in the game or sport, you will find that research recognizes high degree of physical as well as psychological factors that may ensure the best performance. In this context, the investigation of Tanner (1964), Carter (1970), Health and Carter (1966), Stepnieka (1972), Tittel and Wutscherk (1972) have brought in focus the contribution of human biologists to deal with top athletes. In nutshell we can say that hematological variables play an important role in the field of sports. The purpose of the study was to find out significant differences on the account of selected hematological variables between short and middle distance male runners i.e. Blood Glucose, Blood Urea, HDL Cholesterol and LDL Cholesterol.

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Materials and Methods

Subjects

The present study was conducted on a sample of one hundred & twenty (N=120) male athletes of 18-25 years of age, which includes short distance runners (N₁=60) and middle distance runners (N₂=60), were selected as subjects, from All India Inter-University Athletics Championships. All the participants were informed about the aim and methodology of the study and they volunteered to participate in this study.

Methodology

All the participants were assessed for selected hematological variables i.e. Blood Glucose, Blood Urea, HDL Cholesterol

and LDL Cholesterol. All the subjects were examined in Pathological Lab and blood sample were taken by the certified expert of the medical field.

Statistical analyses

Data was analyzed using SPSS Version 16.0 (Statistical Package for the Social Sciences, version 16.0, SPSS Inc, Chicago, IL, USA). The independent samples t-test was applied to assess the differences between selected hematological variables between short and middle distance male runners. The level of significance was set at 0.05.

Results

Table 1: Hematological Variables of Short and Middle Distance Male Runners.

Variables	Short Distance Runners (N ₁ = 60)		Middle Distance Runners (N ₂ = 60)		Mean Difference	t-value
	Mean	SD	Mean	SD		
Blood Glucose	78.65	5.31	80.08	5.05	1.43	1.514
Blood Urea	18.17	1.61	21.18	2.69	3.01	7.457*
HDL Cholesterol	49.38	3.58	50.40	4.11	1.02	1.443
LDL Cholesterol	103.32	7.48	83.27	12.68	20.05	10.548*

*Significant at 0.05 level $t_{.05} (118) = 2.00$

Table-1 presents the results of short and middle distance male runners with regard to selected hematological variables i.e. Blood Glucose, Blood Urea, HDL Cholesterol and LDL Cholesterol. Results revealed significant differences between short and middle distance male runners with regard to the variable Blood Urea (7.457) and LDL Cholesterol (10.548) whereas insignificant differences have been found with regard

to Blood Glucose (1.514) and HDL Cholesterol (1.443). While comparing the means it revealed that short distance male runners have better readings of blood urea and LDL cholesterol than middle distance male runners but both the groups are having almost the same blood glucose and HDL cholesterol. The mean values of short and middle distance male runners have been given below:

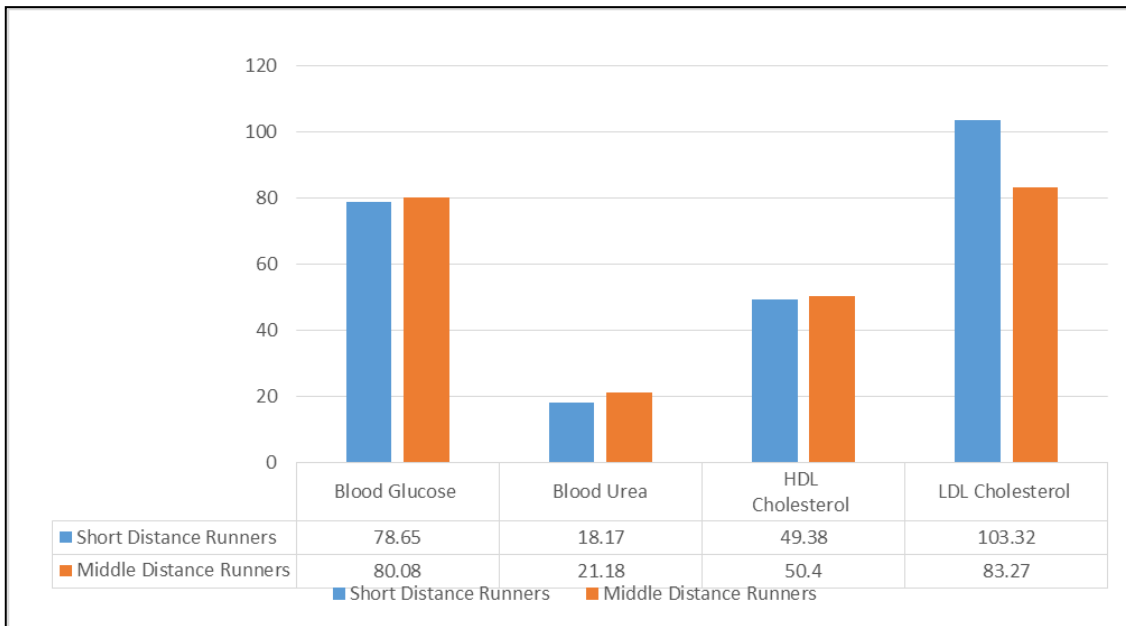


Fig 1: Short and middle distance runners

Discussion

The purpose of the present study was to find out the significant differences between medalist and non-medalist judokas with regards to selected physical fitness variables. Analysis of data observed that both the groups have shown almost the same value of Blood Glucose sub variable of hematological variable. The outcome of existing study on the account of Blood Glucose is partially in line with the results of Gokhan, I. *et al.* (2013) [4], as they explored in their study that there was not a significance difference on the account of blood glucose between soccer players and non-athletes.

Middle Distance Runners groups have shown better than Short Distance Runners group on Blood Urea a sub variable of hematological variable. The result of current study in respect to blood urea is partially in line with the outcomes of Manna, I. *et al.* (2011) [7]. They revealed in their study that there was significance higher amount of blood urea in the Under-23 and Senior Indian Field Hockey Players than Under-16 and Under-19 Indian Field Hockey Players. Results also partially maintained by the study of Nikolaidis, M.G. *et al.* (2003) [8], as they found significant differences on the account of blood urea according to age, sex, and physical

activity in the juvenile and adult athletes and non-athletes of both sexes. Results perceived that both the groups have shown almost the same value of HDL Cholesterol a sub variable of hematological variable. The outcome of existing study in respect to HDL Cholesterol is partially in line with the outcomes of Manna, I. *et al.* (2011) ^[7]. They discovered in their study that there was no significance difference in amount of HDL Cholesterol in the Under-16 and Under-19 Indian Field Hockey Players. And similarly no significance difference between Under-19 and Senior Indian Field Hockey Players. Short Distance Runners groups have shown better than Middle Distance Runners group on LDL Cholesterol a sub variable of hematological variable. The finding of present study with respect to LDL Cholesterol is partially in line with the outcome of study done by Suel, E. (2013) ^[10], as he revealed in his study that sedentary students had higher LDL Cholesterol than athletes. Another study done by Kayatekin, B.M. *et al.* (1998) ^[5] partially supported the present result.

Conclusions

It is concluded that significant differences have been found between short and middle distance male runners with regard to the variable blood urea and LDL cholesterol whereas insignificant differences have been found with regard to blood glucose and HDL cholesterol. Short distance male runners have better readings of blood urea and LDL cholesterol than blood urea and LDL cholesterol but both groups are having almost the same blood glucose and HDL cholesterol.

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