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Pulse rate and blood pressure among selected non-contact games: A comparative study

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Abstract
The purpose of the present study was to compare the pulse rate and blood pressure among selected national level male volleyball, cricket and baseball players. For the purpose of the study, sixty (N=60) national level male players (twenty for each game) from Chandigarh (UT) were selected as subjects of the study by using purposive sampling technique. The age of the subjects ranged between 19-25 years. To find out the significance differences selected national level male volleyball, cricket and baseball players, one way ANOVA was used with the help of SPSS software. Further Scheffe's post-hoc test was applied to see the direction and significance of differences where 'F' ratio was found significant. The level of significance chosen was .05. There were no significant differences obtained on blood pressure and pulse rate among national level male volleyball, cricket and baseball players on pulse rate and blood pressure (systolic and diastolic).

Keywords: Pulse Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Volleyball, Cricket, Baseball

Introduction

Physiological fitness is special to each activity. Studies provide evidence that physiological components effects individuals' capacity for exercise, training and performance. During aerobic exercise, systolic blood pressure increases with increasing intensities, while the diastolic blood pressure response remains near resting values and decrease slightly (Ekelund & Holmgren, 1976). Studies tell us that blood pressure has a positive relationship with training. Athlete with aerobic training will have lower blood pressure during rest and submaximal intensity workout. Blood pressure increases up to 200 mmHg for systolic and 80 mmHg for diastolic pressure during maximum intensity. On the other hand, resistance training involving heavy exertion increases both systolic pressure up to 250 mmHg and diastolic pressure up to 150 mmHg. Level of blood pressure varies according to type of training.

Pulse rate is occurs with each beat of the left ventricle that creates a pressure wave. A fit person will have lower pulse rate. Pulse rate also reduced with regular aerobic capacity. Blood pressure has an important effect on performance of an individual. The pressure blood flows in arteries of an individual in heart is known as blood pressure. Blood pressure changes during the day. The cardiac output response to increase dynamic exercise workload triggers a progressive rise in systolic blood pressure in a normal adult and at the same time, diastolic pressure typically remains stable or declines slightly, reflecting change in peripheral vascular resistance.

Aerobic exercise training decreases systolic and diastolic blood pressure during rest and submaximal exercise. Systolic and diastolic blood pressure generally decline approximately to 6 to 10 mm Hg with regular aerobic exercise for previously sedentary adult men and women for all age. (McArdle, Ketch and Katch, 2006) [4]

Studies have been revealed that blood pressure has a positive relationship with training. Level of blood pressure varies according to type of training. Athlete with aerobic training will have lower blood pressure during rest and submaximal intensity workout. Blood pressure increases up to 200 mmHg for systolic and 80 mmHg for diastolic pressure during maximum intensity and resistance training involving heavy exertion increases both systolic pressure up to 250 mmHg and diastolic pressure up to 150 mmHg. Pulse rate is occurs with each beat of the left ventricle that creates a pressure wave. A fit person will have lower pulse rate. Pulse rate also reduced with regular aerobic capacity.

Objectives of the Study

The objectives of the study were to compare the pulse rate and blood pressure (systolic blood pressure and diastolic blood pressure) among selected national level male volleyball, cricket and baseball players.

Materials and Methods

For the purpose of the study, sixty (N=60) national level male players (volleyball=20, cricket=20 and baseball=20) from Chandigarh (UT) were selected as subjects of the study by using purposive sampling technique. To assess pulse rate and blood pressure of the subjects, Perfecxa TM Fully Automatic Upper Arm Blood Pressure Monitor (MC 100F) was used. To find out the significance differences among national level players on physiological variables (systolic blood pressure and diastolic blood pressure and pulse rate, Analysis of Variance (ANOVA) was applied with the help of SPSS software. For testing hypothesis, the level of significance chosen was 0.05.

Fig I: Illustration of Pulse Rate and Blood Pressure Measurement

Findings

Descriptive analysis of pulse rate among national level male volleyball, cricket and baseball players is presented in table-1.

Table 1: Descriptive Analysis of Selected Different Three Games on Pulse Rate

Variable	Group	N	Mean	Std. Deviation	Std. Error
Pulse Rate	Volleyball	20	73.35	13.83084	3.09267
	Cricket	20	82.15	11.51784	2.57547
	Baseball	20	80.20	9.95040	2.22498

The Analysis of Variance (ANOVA) among national level male volleyball, cricket and baseball players on pulse rate is presented in Table 2.

Table 2: ANOVA of Selected Different Three Non-Contact Games (Volleyball, Cricket and Baseball) On Pulse Rate

Variable	Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Pulse Rate	Between Group	854.433	2	427.217	3.030	.132
	Within Group	8036.300	57	140.988		
	Total	8890.733	59			

**Significant at .05 level*

$F_{.05}(2, 57) = 3.15$

Table 2 clearly indicates that there was no significant difference among national level male volleyball, cricket and baseball players on pulse rate since the F obtained at .05 level was 3.030 whereas, the value needed to be significant was 3.15 for 2 and 57 degree of freedom at .05. Mean scores of different three games on pulse rate are graphically depicted in figure-1.

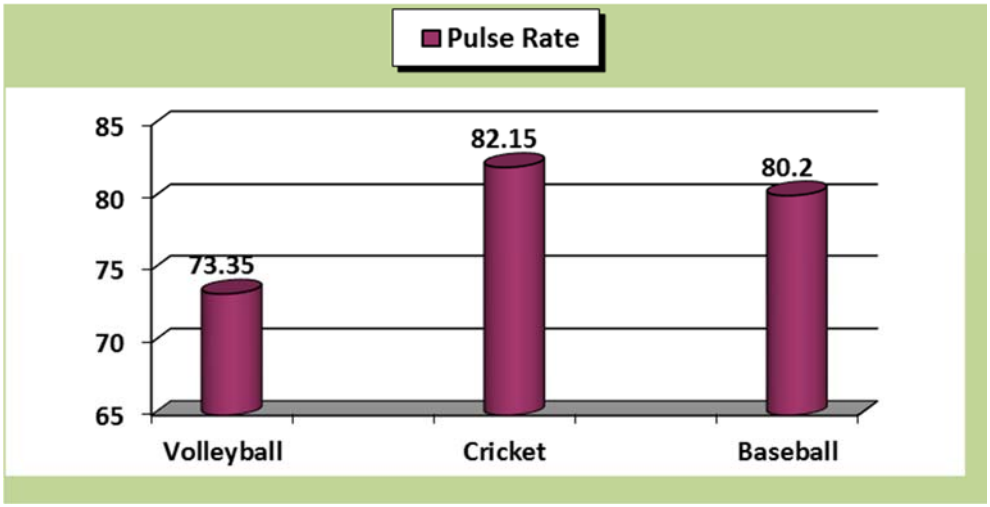

Fig 1: Graphical Representation of Mean Scores of Selected Different Three Non-Contact Games (Volleyball, Cricket and Baseball) on Pulse Rate

Descriptive analysis of blood pressure (systolic and diastolic) among national level male volleyball, cricket and baseball players is presented in table-3.

Table 3: Descriptive Analysis of Selected Different Three Games on Blood Pressure (Systolic Blood Pressure and Diastolic Blood Pressure)

Variable	Group	N	Mean	Std. Deviation	Std. Error
Systolic Blood Pressure	Volleyball	20	123.65	8.412	1.881
	Cricket	20	133.05	13.335	2.981
	Baseball	20	124.85	16.271	3.638
Variable	Group	N	Mean	Std. Deviation	Std. Error
Diastolic Blood Pressure	Volleyball	20	80.55	8.550	1.911
	Cricket	20	75.85	19.775	4.422
	Baseball	20	78.10	10.715	2.396

The Analysis of Variance (ANOVA) among national level male volleyball, cricket and baseball players on blood pressure is presented in Table 4.

Table 4: ANOVA of Selected Different Three Games on Blood Pressure (Systolic Blood Pressure and Diastolic Blood Pressure)

Variable	Source of Variance	Sum of Squares	df	Mean Square	F
Systolic Blood Pressure	Between Group	1046.933	2	523.467	3.059
	Within Group	9754.050	57	171.124	
	Total	10800.983	59		
Diastolic Blood Pressure	Between Group	221.033	2	110.517	.573
	Within Group	11001.300	57	193.005	
	Total	11222.333	59		

**Significant at .05 level*
$F_{.05}$ (2, 57) = 3.15

Table-4 clearly indicates that there were no significant differences among national level male volleyball, cricket and baseball players on blood pressure (systolic blood pressure and diastolic blood pressure) since the obtained 'F' values at 0.05 level were 3.059 (systolic blood pressure) and .573 (diastolic blood pressure) whereas, value needed to be significant was 3.15. Mean scores of different three games on blood pressure are depicted graphically in figure-2.

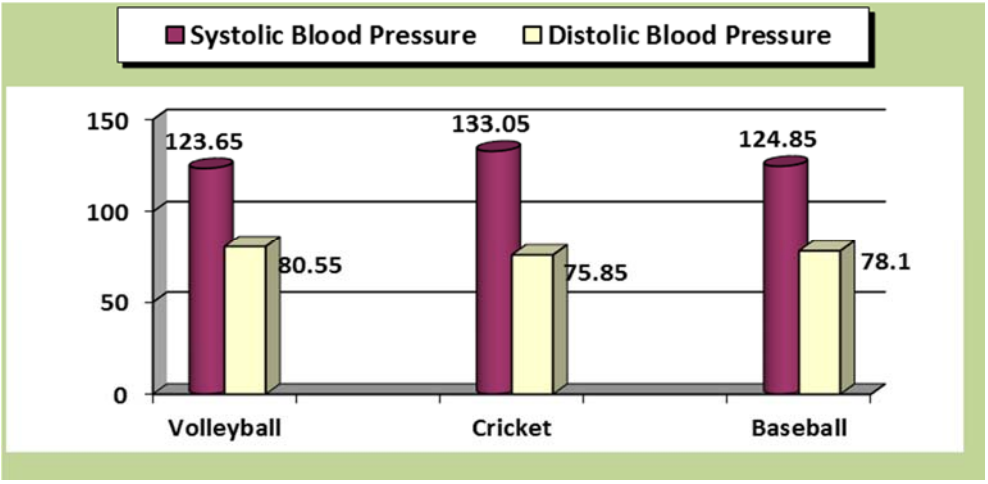

Fig 2: Graphical Representation of Mean Scores of Selected Different Three Non-Contact Games (Volleyball, Cricket and Baseball) on Blood Pressure

Discussion of Findings

The finding of the study showed that there were no significant differences obtained on pulse rate and blood pressure (systolic and diastolic) and among national level male volleyball, cricket and baseball players. The probable reason could be that the sports of volleyball, cricket and baseball players need equal level of fitness which are highly required while performance certain skills like jump passing, quick running, serving and blocking etc. in volleyball and catching, hitting the ball with bat, quick running, throwing the ball in cricket and catching, quick running, throwing and hitting the ball etc. in baseball. Henceforth, the physiological variables like pulse rate and blood pressure among national level male volleyball, cricket and baseball players could not be differentiated.

Conclusions

In the light of the findings and limitations of the present study the following conclusions were drawn:

1. No significant difference was found among selected three non-contact games i.e., volleyball, cricket and baseball players on pulse rate.
2. No significant differences were found among selected three non-contact games i.e., volleyball, cricket and baseball players on systolic blood pressure and diastolic blood pressure.

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