

Review Article

Effect of high intensive football match on selected physiological variables

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Abstract

The aim of the study was to find out the effect of high intensive football match on selected physiological variables. For this purpose 20 male football players with the mean age 24.6 ± 1.74 year were acted as a subject. Oral body temperature, body weight & blood pressure were the selected as physiological variables, which were measured by digital thermometer, weight machine and digital blood pressure. All the data were collected fifteen minute prior and instantly after the end of the match. Paired "t" was used as a statically tool which revealed that there were statistical significant was observed in all the selected physiological variables. The obtained "t" value for oral body temperature was 9.18, for body weight 7.12, for diastolic blood pressure 8.17 & for systolic blood pressure 8.88 was found between all the physiological variables before and after the high intensive football match.

Key word - Oral body Temperature, Blood Pressure, Body Weight

Introduction

The game of football is any of numerous similar team sports, of similar origins which involves, varying degrees, kicking a ball with the foot in an attempt to score a goal. "Soccer" or the most popular of these athleticisms worldwide is associated to football, more commonly known as just "football" (<http://www.docstoc.com/>). Football is one of the most popular games played on the earth which requires lots of physical involvement. Footballers remain continuous on his feet to perform his best. During a ninety minute match various physical and biochemical changes take place which indicate the exhaustion of a match. The drowsiness can be measured in terms of heart rate, respiratory rate, blood pressure, body temperature and so on. (Ron J. Maughan - 2006)

The body temperature works and ticks like an internal clock controlling our sleeping cycles. This also controls the metabolism, circulation and other involuntary activities that the body undertakes. Variation in physical structure temperature also bespeaks and induces the feeling of being alive to bring ones the feeling of being awake. Reduction in body temperature brings one the feeling of lassitude, fatigue and step down in the organism's structure temperature. (Wilbur Arthur Selle, 1954) Conversely, a rise in body temperature induces the feeling of alertness, feeling of being energetic resulting in better concentration levels. The rise and fall of body temperature during the twenty four hours should not be misinterpreted as the need to rest or sleep. (Austin B., 2009) This happens many times during the day depending upon the body's activity level at a given time. When a body is pushed for activity, the body temperature automatically goes up and drops slowly and when a human body is pushed for heavy physical activity, the body temperature automatically goes up. This step down of organic structure temperature induces a feeling of fatigue to bring ones a feeling of fatigue. (hotexercise.com, 2011-01-03)

The term blood pressure usually refers to the pressure measured at a person's upper arm. It is measured on the inside of an articulation cubiti at the brachial artery, which is the upper arm's major blood vessel that carries blood away from the heart. (Tom Fahey, 2004) A person's BP is usually expressed in terms of the systolic pressure over diastolic pressure (mmHg). Blood pressure is the force per unit area exercised by circulating blood upon the walls of blood vessels (Dr.G.D.Thapar, 2004). During each heartbeat, BP varies between a maximum (systolic) and a minimum (diastolic) pressure. The mean blood pressure, due to pumping by the heart and opposition to flow in blood vessels, decreases as the circulating blood moves away from the heart through arterial blood vessels. Blood pressure drops most drastically as the size of the arteries continues to decrease. And the blood moves through the capillaries back to the heart through vein's gravity, and pumping from contraction of skeletal muscles, are some other influences on BP at various lay in the body (Hugh Coni, 2003).

Studies conducted revealed the fact that, high intensive exercise brings the change in the body temperature and blood pressure in a sportsman, keeping this idea researcher scholar notion this study. (W. J. Young, 1920, Jens Bangsbo, 2007)

Methodology

The subjects selected were twenty males football players with age 24.6 ± 1.74 year participated at the national level football tournament held at Guwahati. The football players were selected randomly from top five teams on the bases of their performance in last year national level football tournament. Researcher scholar had clearly told the intention of the study and the subjects were voluntary prepared to take part in the research study. For the study the oral temperature and body weight & blood pressure were taken, the data were collected in relation with selected variable i.e. oral temperature and body weight & blood pressure fifteen minute prior the football matches and immediately after the end of the match. A subject was asked to sit on a chair, the channel of the digital temperature indicator was set and the rod was placed under the tongue of the subjects, when the temperature on the digital temperature indicator became constant the reading was noted. Readings were taken before and immediately after the exercise. Sweating was measured with the help of body weight. A subject was weighed before the exercise with minimum possible cloth and immediately after the exercise. The subject was asked to wipe off all the sweat with the help of a towel and then weighed in minimum possible clothes after the exercise. The blood pressure was measured by digital blood pressure machine. The study statistical model used was paired ‘t’ test which was calculated by using SPSS version 17.0.

Results

The data were analyzed and presented in descriptive and paired “t” table’s form on selected variables .i.e. were oral body temperature, body weight, and blood pressure of national level football players.

Table-1
Descriptive Statistics of Oral Body Temperature before & After the End Of Football Match

	N	Minimum	Maximum	Mean	Std. Deviation
Pre Oral Temperature	20	35.40	36.90	36.20	0.441
Post Oral Temperature	20	36.80	37.80	37.14	0.299

Table-1 shows that, mean pre & post oral temperature were $36.20^{\circ} \pm 0.441$, and $37.14^{\circ} \pm 0.299$. Minimum pre and post oral body temperature were 35.40° & 36.80° . Maximum pre and post oral body temperature were 36.90° & 37.80° obtained from 20 national football players.

Table-2
Significant Difference between Oral Body Temperature before & After the End Of Football Match

	Paired Differences				t	df	Sig. (2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower				Upper
Pre Oral Temperature - Post Oral Temperature	0-.915	0.4171	0.093	-1.110	0-.719	-9.81	19	0.000

Table-2 depicts, that there was significant difference were seen in oral body temperature before & after the end of football match as the obtain ‘t’ value was 9.81 was found to be statistically significant at the degree of freedom 19. ($p < 0.05$)

Table-3
Descriptive Statistics of Body Weight before & After the End Of Football Match

	N	Minimum	Maximum	Mean	Std. Deviation
Pre Body Weight	20	52.00	87.50	66.3000	8.55847
Post Body Weight	20	51.80	85.70	65.5450	8.39527

Result of table-3 clearly pictures that, mean pre & post body weight before and after the end of football match were 66.30 ± 8.55 , & 65.54 ± 8.39 . Minimum pre and post body weight were 52.00 & 51.80. Maximum pre and post body weight were 87.50 & 85.70 obtained from 20 national football players.

Table-4
Significant Difference between Body Weight before & After the End Of Football Match

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre Body Weight - Post Body Weight	0.755	0.474	0.106	0.533	0.976	7.123	19	0.000

Table-4 evident, that there was significant difference were seen in body weight before & after the end of football match as the acquired 't' value was 7.123 was found to be statistically significant at the degree of freedom 19. ($p < 0.05$)

Table-5
Descriptive Statistics of Diastolic Blood pressure before & After the End Of Football Match

	N	Minimum	Maximum	Mean	Std. Deviation
Pre Diastolic Blood Pressure	20	79.00	83.00	81.1500	1.08942
Post Diastolic Blood Pressure	20	76.00	80.00	78.2500	0.91047

Its manifest, from table-5 that descriptive statistics of mean & standard deviation of diastolic blood pressure before & after the end of football match 81.15 ± 1.089 & 78.25 ± 0.910 . Minimum pre & post diastolic blood pressure were 79.00 & 76.00. Maximum pre & post diastolic blood pressures were 83.00 & 80.00 obtained from 20 national football players.

Table-6
Significant Difference between Diastolic Blood Pressure before & After the End Of Football Match

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre Diastolic Blood Pressure - Post Diastolic Blood Pressure	2.90	1.58	.35467	2.1577	3.642	8.177	19	0.000

It's apparent from table-6, that there was significant difference were establish in diastolic blood pressure before & after the end of football match as the acquired 't' value was 8.177 was found to be statistically significant at the degree of freedom 19. ($p < 0.05$)

Table-7
Descriptive Statistics of Systolic Blood pressure before & After the End Of Football Match

	N	Minimum	Maximum	Mean	Std. Deviation
Pre Systolic Blood Pressure	20	120.00	125.00	122.50	1.76218
Post Systolic Blood Pressure	20	130.00	157.00	138.45	7.75598

Result of table-7 obviously that, mean pre & post systolic blood pressure before and after the end of football match were 122.50 ± 1.76 , & 138.45 ± 7.75 . Minimum pre and post systolic blood pressure were 120.00 & 130.00. Maximum pre and post systolic blood pressures were 125.00 & 157.00 obtained from 20 national football players.

Table-8

Significant Difference between Systolic Blood Pressure before & After the End Of Football Match

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre Systolic Blood Pressure - Post Systolic Blood Pressure	0-159	8.029	1.795	-19.77	-12.1	8.88	19	.000

It's noticeable from table-8, that there was significant difference were ascertain in systolic blood pressure before & after the end of football match as the acquired 't' value was 8.88 was found to be statistically significant at the degree of freedom 19. ($p < 0.05$)

Discussion

Playing football for just recreational purpose has become history now, people are taking football as a business and this makes the researchers from all the various parts to discover the scientific approaches to improve the performance of football players to its extreme level. Even, players have to exhaust themselves to excessive echelon which brings lots of physiological changes as per the intensity of the football match, keeping the basis idea research scholar conceptualised the study. The results are found after analysing the data given by the facts about the various changes that takes place before and after the high intensive football match.

The mean value attained of oral body temperature before and after the football match showed that there was increase in the oral body temperature as the mean value before the match was 36.20° and after the match were 37.80° . Even, the statistical significant difference was perceived in the oral body temperature before and after the end of the match as the gained F value was 9.81 at the degree of freedom 19. Similar results were found in the study of (Anthony D. Jose M.A, 1970, & R. Mostardi, 1974)

The mean value of body weight before the football match was 66.30 kg which decreases after the end of match as the mean value of body weight was 65.54kg. The acquired F value 7.123 at the degree of freedom 19 furthermore shows that there was statistical significant difference in body weight before the match and after the end of rigorous football match.

The mean value accomplished of diastolic blood pressure before and after the football match showed that there was decrease observed in the diastolic blood pressure as the mean value before the match was 81.15 mm/Hg and after the match were 78.25 mm/Hg. Even, the statistical significant difference was perceived in the diastolic blood pressure before and after the end of the match as the gained F value was 8.177 at the degree of freedom 19 (Whelton S.P, 2002, R.H, fagard 2005).

There was an increase in the mean systolic blood pressure, the obtained mean value before the match was 122.50 mm/Hg and after the end of the match systolic blood pressure value was 138.45 mm/Hg, the acquired F- value 8.88 at the degree of freedom 19. Furthermore, its shows that there was statistical significant difference in systolic blood pressure before the match and after the end of rigorous football match.

To perform glowing athlete need lots of energy this is fulfilled by the supply of blood through the active muscles. To supply the blood the heart need to beat fast which increases the inner body temperature. Over 60% of the energy released from food molecules during catabolism is converted into heat rather than being transferred to ATP, and there for maintaining a constant body temperature is a challenge. When the body is overheated blood flow to the skin increase. Warm blood from the body's core can then be cooled by the skin. (Gary A, 1992) Body temperature need to be balanced for this more sweating take place which reduces the body fluid from the body in the form of sweating which is cause of weight loss after the exercise.

Dynamic exercises build-up the heart by consuming oxygen in the blood stream that needs to be filled and reloaded by the heart. This causes the heart to beat faster and recover the oxygen debt. This is responsible to bring the common go up in systolic pressure, which increases gradually as the exercise continues. During the first few minutes of exercise the muscles need more energy, (Timothy Noakes, 2003) the blood needs more oxygen and the lungs work harder to get excess air for this purpose. The heart, in turn, needs to pump the blood

faster and harder to reach the muscles as earliest possible. Sweating is controlled by the temperature of the blood flowing to the component part of the brain called the hypothalamus. When the temperature rises its sweats more. During exercise, heart beats very rapidly to pump blood to bring oxygen to the muscles and hot blood from the muscles to the skin where the heat can be dissipated. When an athlete stops exercising, the heart immediately slows down, decreasing the amount of blood pumped to skin, so the temperature rises higher and sweats more. This causes a sudden and sharp increase in systolic blood pressure and the blood "pounds" through the veins to deal out as much oxygen as it can. Exercise with all factors remaining equal, systolic blood pressure gradually increases while diastolic blood pressure remains about the same, in upright position. Diastolic pressure may even decrease due to vasodilatation, to spread more oxygen throughout the body.

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