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Analysis of blood lactate response in football small sided game among football players

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Abstract

The purpose of the study was to analyze the Blood Lactate response among the 17-23 age group in a small sided football games of sixteen (16) male collegiate level players from L.N.I.P.E, N.E.R.C, Guwahati. All the volunteers are from football specialization who trained regularly for more than 2 hours. A randomized two teams divided for 8vs 8 a small sided football game. The volunteers were made aware of testing and collection of the sample technique. For the collection of the data, the variables selected for the present experiment was blood lactate level was measured using SENSE CARE LACTO SPARK and unit of measurement was Millimole per liter (mmol/l) for blood lactate level. To evaluate the hypothesis, descriptive statistics such as Mean, S.D and Compare mean such as Dependent “t” test was applied and was tested at 0.05 level of significant. The statistical finding reveals that the “t” value was 8.32 which was greater than the tabulated “t” value 2.13 at 0.05 level of significant. This “t” statistic was significant as its corresponding “p” value was 0.00001 which was less than 0.05. Thus, the null hypothesis is rejected and it was concluded that the small sided football game (8vs8) showed significant changes in lactate level amongst the players.

Keywords: Blood lactate, “t” test & sense care lacto spark

Introduction

Small Sided Game- Beginning August 1, 2017, new norms in youth soccer will be enforced across the country. These norms are known as Player Development Initiatives (PDIs). A crucial element to these PDIs is new norms of play for small- sided games. There are five affects you need to know about the new regulations for youth games. Small- sided norms are youth games played with lower than 11 players on each platoon. Playing with smaller players on the field means that players are constantly involved in play and handed with further openings for traces on the ball and overall player development. With smaller players on the field, players have a lesser occasion to play further meaningful twinkles. They will be involved in the game, with or without the ball, much further than in a full- sided game, creating further chances for literacy and enhancement. Reading the game and decision timber are some of the most important rates for a player that will profit from playing small sided games. Smaller Players, further Development- With smaller players on the field, players have a lesser occasion to play further meaningful twinkles. They will be involved in the game, with or without the ball, much further than in a full- sided game, creating further chances for literacy and enhancement. Reading the game and decision timber are some of the most important rates for a player that will profit from playing small sided games To descry high situations of lactate in the blood, which may be an suggestion of lack of oxygen (Hypoxia) or the presence of other conditions that beget redundant product or inadequate clearing of lactate from the blood; this test isn't meant to be used for webbing for health status. Tested when you have symptoms similar as rapid-fire breathing, nausea, and sweating that suggest a lack of oxygen or an abnormal blood pH (Acid/base imbalance); when a healthcare guru suspects that you may be passing sepsis, shock, heart attack, severe congestive heart failure, order failure, or deficiently treated (Unbridled) diabetes; when a health care guru suspects that you have inherited a rare metabolic or mitochondrial complaint; when you have symptoms of lactic acidosis similar as sweet- smelling breath, belly pain, confusion or cool and glacial skin.

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A blood sample is obtained by fitting a needle into a tone in the arm. Occasionally, an arterial sample is collected by fitting a needle into a roadway. Sometimes, a sample of cerebrospinal fluid is collected from the spinal column during a procedure called a spinal valve. Blood lactate situations will generally be drawn either without the use of a tourniquet or with a tourniquet that isn't released during the blood draw. Tourniquet use and release and clenching of the fist can increase lactate situations in the blood sample. Typically, the position of lactate in blood and CSF is low. Lactate is produced by muscle cells, red blood cells, brain, and other apkins when there's inadequate oxygen at the cellular position or when the primary way of producing energy in the body's cells is disintegrated. Redundant lactate can lead to lactic acidosis. The top means of producing energy within cells occurs in the mitochondria, bitsy power stations inside utmost cells of the body. The mitochondria use glucose and oxygen to produce ATP (Adenosine triphosphate), the body's primary source of energy. This is called an aerobic energy product.

Aim of the study

The Aim of the study was to analyze the Blood Lactate Acid Response in Football Small Sided Game among the Football Players.

Materials and Methods

Design of the study

A Random group design were adopted for the purpose of the study. The volunteer was divided into two teams for 8 vs 8 small sided match.

Volunteer of the Study

For the purpose of the study total 16 male football player from L.N.I.P.E, Guwahati were selected as volunteers of the study and all the volunteer belongs to the age group of 17 to 23-year-old. They were selected according to their playing position who practice football training regularly during the evening time for two hours. Randomized all the volunteers divided into two teams for 8 vs 8 small sided football games. The data were collected pre and post of the 45 min

match. The volunteers need to put their best during the small sided game for 45 minutes.

Delimitation of the study

- Delimited to the blood lactate response only (Measured by Sense Care Lacto Spark).
- Confined to 16 volunteers from L.N.I.P.E, N.E.R.C Football match practice.
- Age ranged from 17 to 23 years.

Limitation of the study

- Psychological and physiological factors that affect metabolic function were consideration as limitation of the study.
- Diet, lifestyle, daily routine, habits, etc are considered as limitations of this study.
- Atmospheric temperature, humidity and meteorological factors also consider as limitation of the study.

Results

The data was examined by applying descriptive statistics, paired t-test (Dependent t-test) to find the comparison between pre and post data of blood lactate level in football small sided game (8v8). To test the hypothesis the level of significance was set at 0.05. Data was normally distributed and there was no heterogeneity in sample distribution.

Table 1: Descriptive statistics of Blood Lactate of Pre and Post of Small Sided Football Game

Parameter/Group	Blood Lactate (Pre)	Blood Lactate (Post)
Mean	3.64	7.07
Median	3.55	7
Standard Deviation (S.D)	1.634	2.016
Standard Error	0.409	0.504
Sample Size (N)	16	16
Minimum	1.6	3.1
Maximum	6.1	12
Range	4.5	8.9
Sum	58.3	113.2

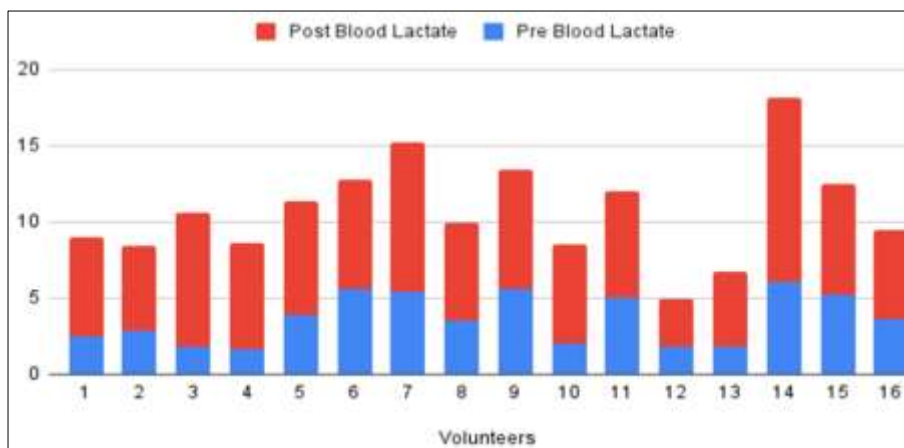


Fig 1: Graphical Representation of Pre and Post of Blood Lactate Level (mmol/L)

Table 2: Test of Normality

	Kolmogorov-Smrnov (a)			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Pre T	0.17	16	0.235	0.846	16	0.048
Post T	0.17	16	0.233	0.946	16	0.429

The above Table no. 2 reveals the descriptive statistics of the value of the test statistic and P-value of the blood lactate pretest and post of small sided football game of Kolmogorov-Smirnov test and Shapiro-Wilk test.

The Shapiro-Wilk tests did not showed a significant from the normality, $W(16) = 0.946$, $p = 0.429$ and Results of the Lilliefors test indicated that there is a non-significant difference from the normal distribution, $D(16) = 0.17$, $p = 0.233$.

Table 3: Dependent t-Test of blood lactate of football players in small sided game.

	Df	Mean	S.D.	S.D. Error	't'	p-value
Pre-test	16	3.64	1.634	0.409	2.131	0.05
Post test	16	7.07	2.016	0.504	8.329	0.00001

Since it is observed in above table-3 that $|t| = 8.329 > t_c = 2.131$, it is then concluded that the null hypothesis is rejected. Using the P-value approach: The p-value is $p = 0$, and since $p = 0 < 0.05$, it is concluded that the null hypothesis is rejected.

Above table reveals that the value of the statistic is 8.328 which is greater than the tabulated t value 2.131, at the $\alpha = 0.05$ significance level. This t-statistic is significant as its corresponding p value is 0.00001, which is less than 0.005. Null hypotheses were $H_0: \mu = 0$, $H_A: \mu \neq 0$. Thus, the null hypothesis is rejected and we can conclude that the small sided football game (8v8) increased blood lactate level of football players.

Discussion

On the basis of the result it has been obtained that football small-sided game affects the blood lactate concentration because football small-sided game is a speed endurance game in which the players attempt many sprints with the ball and without the ball. Forty-Five (45) minutes football small-sided game anaerobic and aerobic type activity involved with major muscle work of the football player. The rise in lactic acid (LA) continues during long time maximal speed endurance exercises during which oxygen is not sufficient. It is known that high blood lactate is a limiting factor during exercise. In support of the results Baltaci *et al.* (1993)^[8] studied the effect of VO_2 - directly determined on spiro ergometer and predicted- on lactate in their study on trained athletes of ages 14-18 years. High correlation was observed between VO_2 max and lactate concentration on bike and treadmill (for bike $r = 0.99$, for treadmill $r = 0.97$). Also, a highly significant relation was found between loading as watt or km/hour and lactate concentration (for bike $r = 0.98$, for treadmill $r = 0.99$). The study of Baltaci *et al.*^[3] is parallel with ours. In support of the results Kaya, Ismail *et al.* (2013)^[9] determined the relation between the load increase of the groups and their heart rate and between the load increase of the groups and their blood lactate values. The test results revealed a significant relation between the load means applied on the subjects and their heart rate at the rate of $r = 0.99$; between the applied load means and blood lactate at the rate of $r = 0.97$.

Conclusion

On the basis of finding, data collection and with the limitation of the present study, the following conclusions are drawn:

1. There is a significant difference between pre-test and posttest on blood lactate level amongst 17-23 age groups after a football small-sided game.
2. It was found that the higher concentration of blood lactate (lactic acid), increases the heart rate after the small sided football game.
3. The collegiate level football player showed significantly higher rate of blood lactate level after 45 minutes of a small sided football game.
4. Similar, maximum analysis was also noted after the post test (end of the small-sided game) in case of heart rate in analysis of blood lactate acid among collegiate level football players.

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