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Comparison of two Jacuzzi Recovery and Mild Swimming on Saturated Percentage of Hemoglobin

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Abstract
Main aim of this research was comparing mild swimming and recoveries Jacuzzis recovery on blood lactic acid and blood pressure of swimmers. We used descriptive statistics (placebo, median, mean, variance, and standard deviation) for analyzing data in order to compare changes of saturated percentage of blood cell. We collected data from pools of Mashhad and we used from 45 person for collecting information and finally 35 sample data were collected. Normal data distribution by Kolmogorov Smirnov test was used initially in order to reflect the normal distribution of data. Thus, we used t student, alpha error is 0.05, and Excel 2007 and SPSS 18 did analysis. Result of research indicated there is not significant relationship between saturated percentage of blood cell in (swimming 200 m after recovery and recovery) in Jacuzzi recovery and mild swim.

Key words: Blood Cells, Mild Swimming, Jacuzzi Recovery, Hemoglobin, Pulse oximetry

Introduction

One of important issues in field of sport expert is fatigue when we do sport activity, since fatigue and treatment is one of essential limitations in front of performing optimally and successfully. Therefore, numerous researches have been done in order to identify factors of fatigue or scientific procedures in order to postpone fatigue. However, due to vast field of sports field, results of researches and procedures have been various (Gaieni and Mirzaei, 2001). Most of the efforts were related about: 1) Energetic systems (Fsfazhn, Glycolysis, aerobic oxidation) 2) Accessory products of metabolism 3) Neurologic system. Decomposition of acid lactic leads to aggregation of hydrogen ions in muscles cells and then leads to contractile dysfunction (wilmuler, J and Kastel, D, 2006) Most of research shows that energetic systems are essential and vital issues of developing sport skills and importance of these factors are not unavoidable for swimmers. Red globules in intensity sport activity in comparison with rest time are more vulnerable. Since, continuo crash of to walls of vessels is much higher and they are facing with more vulnerable. In addition, acidosis mode happened more in some intensity activities and lead to vulnerable and deposition of red globules.

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THE DETERMINATION OF BLOOD OXYGEN:

Saturation finds application in assessing cardiac out- put, consumption of oxygen in perfused organs, and the severity of vascular shunts such as those found in congenital heart diseases. Available oximetry methods are based primarily on optical transmittance and reflectance differences between oxy- and deoxyhemoglobin.

The resulting measure of blood oxygen saturation is the percentage of hemoglobin that is oxygenated, abbreviated as %HbO2.

The poor penetration of tissue by light, however, limits the noninvasive monitoring of %HbO2 to superficially accessible regions.

The determination of oxygen saturation in deep vascular structures currently must be made via direct sampling of the blood of interest. In this report, we extend the current work relating the T2 of blood (T2b) in magnetic resonance (MR) studies to its oxygen saturation

Hemoglobin Substrate:

A solution is made up containing 8 cc. of 1 N sodium hydroxide, 72 cc. water, 36 gin. urea, and 10 cc. of 22 per cent hemoglobin (22 gin. hemoglobin per 100 cc. solution). This alkaline solution is kept at 25°C for 30-60 minutes potassium dihydrogen phosphate and four gln. of urea. The final pH is 7.5. 1 rag. merthiolate (Lilly) is added to each 50 cc. of hemoglobin solution as a preservative. The hemoglobin solution is stored at 5°C and is stable for weeks. Smaller or larger quantities of substrate solution can, of course, be made up so long as the components are added in the manner and the proportions given.

RBC size and hemoglobin:

Distribution RBC size and hemoglobin concentration histograms generated by the Technicon H-1 blood analyzer were obtained daily in 8 of the 10 subjects (histograms were not available for subjects 1 and 4). In normal subjects taking rEPO, but not in the subject with hemochromatosis (subject lo), an elongated shoulder caused by markedly hypochromic cells with hemoglobin concentrations as low as 20 g/dL was identified on the hemoglobin concentration histogram by day 7 or 8. Representative RBC size and hemoglobin histograms from a subject with normal iron stores (subject 6), both with and without rEPO, and subject 10, with hemochromatosis, are shown in Fig 3. In subject 6, the hypochromic shoulder developed at a time when the femtin (46 ng/mL) and iron saturation (22%) were still normal. In each subject, the shoulder became a distinct second peak over the second week of the study, and maximum size was attained by the end of the fourth week.

The two peaks merged by the end of the sixth week. The RBC volume histogram retained a unimodal shape, although a tail of macrocytic cells emerged during the rEPO administration period.

The hypochromic cell peak was not detected in subjects who donated blood without rEPO. Subject 10, with iron overload, developed a prominent macrocytic tail on the red cell volume histogram and a smaller hypochromic tail on the hemoglobin concentration histogram, but a unimodal distribution was maintained.

Pulse oximetry:

Pulse oximetry is one of the most commonly employed monitoring modalities in the critical care setting. This review describes the latest technological advances in the field of pulse oximetry. Accuracy of pulse oximeters and their limitations are critically examined. Finally, the existing data regarding the clinical applications and cost-effectiveness of pulse oximeters are discussed.

The human eye is poor at recognizing hypoxemia. Even under ideal conditions, skilled observers cannot consistently detect hypoxemia until the oxygen (O2) saturation is below 80% (Conroe and Bothello, 1947). The difficulty that physicians have in detecting hypoxemia was recently exemplified in a study of over 14000 patients being evaluated at the UCLA Emergency Department (Mower et al, 1995) Patients were monitored by oximetry but recordings were given to physicians only after they completed their initial assessment. Changes in diagnostic testing and treatment were most likely at anO2 saturation of 89%, and changes were actually less common at lower saturations, probably because the physicians were able to detect evidence of hypoxemia without requiring a pulse oximeter.
With the proliferation of pulse oximeters in different locations of the hospital throughout the 1980s, several investigators demonstrated that episodic hypoxemia is much more common than previously suspected with an incidence ranging from 20-82% [Roe and Jones (1993); Bierman et al (1992); Eichhorn (1997)]. The significance of episodic desaturation on patient outcome is largely unknown (Moller et al 1993). In patients admitted to a general medical service, Bowton *et al*. Bowton et al (1994) found that O2saturation < 90% of at least 5 min duration occurred in 26% of the patients. On follow-up over the next 4-7 months, those patients experiencing hypoxemia during the first 24 h of hospitalization had more than a threefold higher mortality than patients who did not desaturate. Although episodic desaturationmay simply be a marker of increased risk rather than the direct cause of decreased survival, an increased mortality rate was still observed in patients with episodic hypoxemia when the investigators corrected for severity of illness. Whether or not the early detection and treatment of episodic hypoxemia can affect patient outcome remains unknown (Jurban, 1998).

Objective of research:
Main aim of this is comparing effect of two methods of recovery on Jacuzzi recovery and mild swimming recovery on saturated percentage of blood cells.

Methodology:
Initially normal data distribution Kolmogorov Smirnov test was used in order to reflect the normal distribution of data. For data analysis descriptive statistics were used (placebo, median, mean, variance, and standard deviation) in order to compare changes of Lactic acid of heart rate beat and consumption oxygen of myocardial. Therefore, we used t student, alpha error is 0.05, and Excel 2007 and SPSS in order to analysis of the test.

Hypothesis:
H1: Significant relationship exists between two methods of recovery on Jacuzzi recovery and mild swimming recovery on saturated percentage of blood hemoglobin.

Variables:

Recovery:
A period, which take from end of exercise to initial conditions or resting. Some effective factors on recovery are as following Age, experience of athletes, environmental factors, internal factors, injury, food and Athlete's fitness level.
Operational definition:
Recovery included of recovery by mild swim 5 minutes and recovery in Jacuzzi

Saturated percentage of hemoglobin:

Each gram of blood hemoglobin is combination with 1.23 millimeter of Oxygen. Consequently, about 20 millimeters of oxygen resolve in 100 millimeter of bloods. If amount of hemoglobin achieve to the amount, hemoglobin is saturated by 100 percentages. Average of saturated percentage of hemoglobin in healthy people is 97 percent (37).

Operational definitions:

Saturated percentage of hemoglobin in research of recovery is estimated by system of pulse oximetry throughout pollex.

Fatigue:

Theoretical definition: Fatigue defined as disability in saving determined or expected ability, which is unavoidable maximize sport.(42)

Operational definitions: In current research fatigue is defined as fatigue of 200 meters swimming, if recovery operational period is low, fatigue of originating from lactic aggregation will remain.

Results:

Table 1: Kolmogorov-Smirinov test

Variables	Jacuzzi recovery		Mild swimming recovery	
	Z	Sig	Z	Sig
Saturated percentage of Hemoglobin	1.12	0.1	0.985	0.2

In order to determine normality of the test; we used Kolmogorov-Smirinov test. In according to table Z is more than 0.05, therefore, it can be concluded that data of research are normal.

Table 2: Index of saturated blood cell in two groups of Jacuzzi recovery and mild swim

Recovery	Numbers	Before recovery		After recovery	
		Mean	Sd	Mean	Sd
Jacuzzi recovery	14	95.42	0.75	96.14	0.66
Mild swim	14	95.21	0.69	96.21	0.69

Based on second table, mean of saturated percentage of blood cell is in two methods of Jacuzzi recovery and mild swimming before of recovery was not significant (95.21 and 95.42). Furthermore, mean in two methods of Jacuzzi recovery and mild swimming after recovery was not significant (96.14 VS 96.21).The difference shows that mild swim has essential effect on mean of saturated percentage of hemoglobin.

Table 3: Mean difference between saturated percentage of Hemoglobin Jacuzzi Recovery and Mild Swimming

Variables		Numbers	Mean	Sd	T	Sig	Results
Lactic Acid	Jacuzzi	14	0.714	0.72	1.47	0. 1	Rejected
	Mild swimming	14	1.000	0.00			

Based on the table, t is 1.47 and sig in saturated percentage of hemoglobin in Jacuzzi recovery and mild swim is sig=0. 1. Due t sig is more than 0.05, therefore, null hypothesis is approved and it shows that there is not significant relationship between saturated percentage of blood cell and Jacuzzi recovery and mild swimming. In other words, with confidence of 95% there is not significant relationship between saturated percentage of blood cell in (swimming 200 m after recovery and recovery) in Jacuzzi recovery and mild swim. Eventually, Jacuzzi recovery has more effect saturated percentage of blood cell of swimmers in comparison with recovery of mild swim.

Conclusion and Discussion:

In according to the hypothesis “significant relationship exists between two methods of recovery on Jacuzzi recovery and mild swimming recovery on saturated percentage of blood hemoglobin”. However, Due t sig is more than 0.05, therefore, the hypothesis is rejected. In other words, there is not significant relationship between saturated percentage of blood cell in (swimming 200 m after recovery and recovery) in Jacuzzi recovery and mild swim. This result is consistent with result of Ezadi Avengi (2006). Ezadi Avengi investigated effect of breathing exercise on saturated percentage of oxygen (Sao2) on respiratory disease. Wood, R.J. and Marton (1995) did a research about saturation oxygen and found out that saturated oxygen decrees substantially. Result of the research was consistent with result of Eadi Avangi (2006), Hansen (2004), Kartin (2010), Haji Hassani (2006), Mohebi et al (2009).

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