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Effect of hot water emmersion on the recovery pattern of lactic acid after an anaerobic workout

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Abstract

The present investigation will carried out in order to evaluate the effect of hot watter on the recovery pattern of lactic acid after performing anaerobic workout. A total of 10 (ten) male senior state level hockey players, (5 in each group i.e. 5 Hot water emersion, 5 control group) age ranged from 18 to 25yrs, will be purposively selected from 'selected hockey academy of the Punjab state and they all are accommodated in the hostel. The minimum training age of the participants was two years. All the participants were enquired about their medical history and also they were requested to report any other condition, which causes them long 'term or short term problems in exercise. No drop out in participants was there. The participants were informed about the pros and cons of experiments during the course of research to be conducted in detail and their written willing concern was taken on paper. In the consultation with the experts in the field, minutely gleaning through the literature available and considering the feasibility criteria in mind, especially the availability of equipment. The 'Lactic acid' was considered as the physiological variable in the present study.

Keywords: Lactic acid, hot water emersion, recovery pattern, anaerobic workout

Introduction

In the athletic performance, relaxation training and techniques has play a vital role in the concept of recovery. The soft tissues of the human body or the sensitive organs need to be relax during the recovery process. Some athletes found complexity to differentiate the types of movements performed which are in their own control. It is impossible to be tensed and relaxed simultaneously. In the year, 1995 Francaux *et al.* (1995) [6] investigated lactate metabolism during active and passive recovery. The rate of lactate disappearance increased from passive recovery to moderate exercise recovery and decreased from moderate exercise recovery to intense exercise recovery. Researchers have also tested muscle massage as another method of lactate removal.

Lactate production has been found to be variable in this research work; those athletes who play/run for a long period with shorter recovery times tend to produce higher lactate levels than those who play / run for shorter periods. Lactic acid is the anaerobic end product of glycolysis it has been implicated as a causative factor in the etiology of fatigue.

The end product of anaerobic glycolysis in which the glycogen formed in the absence of oxygen is broken down to lactic acid. During the training, blood lactate production increases might be due to more amounts of heat production in the body and less amount of heat dissipation from the body.

Selection of Subjects

The present investigation will carried out in order to evaluate the effect of hot watter on the recovery pattern of lactic acid after performing anaerobic workout. A total of 10 (ten) male senior state level hockey players, (5 in each group i.e. 5 Hot water emersion, 5 control group) age ranged from 18 to 25yrs, will be purposively selected from 'selected hockey academy of the Punjab state and they all are accommodated in the hostel. The minimum training age of the participants was two years. All the participants were enquired about their medical history and also they were requested to report any other condition, which causes them long 'term or short term problems in exercise.

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No drop out in participants was there. The participants were informed about the pros and cons of experiments during the course of research to be conducted in detail and their written willing concern was taken on paper.

Selection of Variables

In the consultation with the experts in the field, minutely gleaning through the literature available and considering the feasibility criteria in mind, especially the availability of equipment. The 'Lactic acid' was considered as the physiological variable in the present study.

Tools used in the study

The following instruments was use during the commencement of the study, they were as follow: Lactic kit, Stopwatch, Thermometer and Cones.

The stop watches, lactic kit, etc used in this study were calibrated and supplied by the leading firms and their reliability will be ensured by the manufactures. The materials used will of the fine quality and the stop watches measuring 1/100th of a second will used. Thus, the instruments will be considered reliable for the purpose of this study.

Criteria of Measures

Lactic Scout Analyser: Lactic Scout Analyzer, pricking needles and lactate strips manufactured by EKF Diagnostics, leading manufacturer, distributor, exporter and supplier of

lactate testing devices throughout the world were used for the purpose of collection of blood lactate from the finger tip.

Administration and Procedure for Collection of Data

Before the final commencement of the training program, the subjects will ask to warm up for the duration of 10 minutes. Further, Proper guidance and necessary instructions will be given about the study. An Anaerobic workout of 200mt sprint was given as a treatment with supra maximal intensity and a post test was recorded to find out the effect of each hot water on both the groups i.e. experimental and control groups.

Results

The obtained data was analyzed by applying the t statistics at 5% level of significance.

Table 1: Descriptive Statistics of lactic acid for Experimental and Control group after the anaerobic training workout

	Mean	Std. Deviation	N
Experimental Group Hot Water	9.62	1.22	5
Control Group	12.60	1.13	5

Table 1 represents the descriptive statistics of lactic acid for Experimental and Control group after the anaerobic training workout. As the mean and standard deviation were 9.62 ± 1.22 and 12.60 ± 1.13 respectively.

Table 2: t-statistics of lactic acid for Experimental and Control group after the anaerobic training workout

Source	t	df	Mean difference	Sig. (2 tailed)	Standard Error
Lactic Acid Equal Variance assumed	3.98	2	2.76	.000	.76
Equal Variance not Assumed	3.98	8	2.76		.76

The results shown in the above table indicate that there was a significant difference in the lactic acid responses. After anaerobic training workout as the p-value (.000) was less than 0.05 level of significance and t statistics value is 3.98 which is

higher than the tabulated value at degree of freedom 2 and 8. Hence, on basis of the results it can be concluded that there is an effect of hot water treatment (five minutes) in the reduction of lactic after an aerobic training workout.

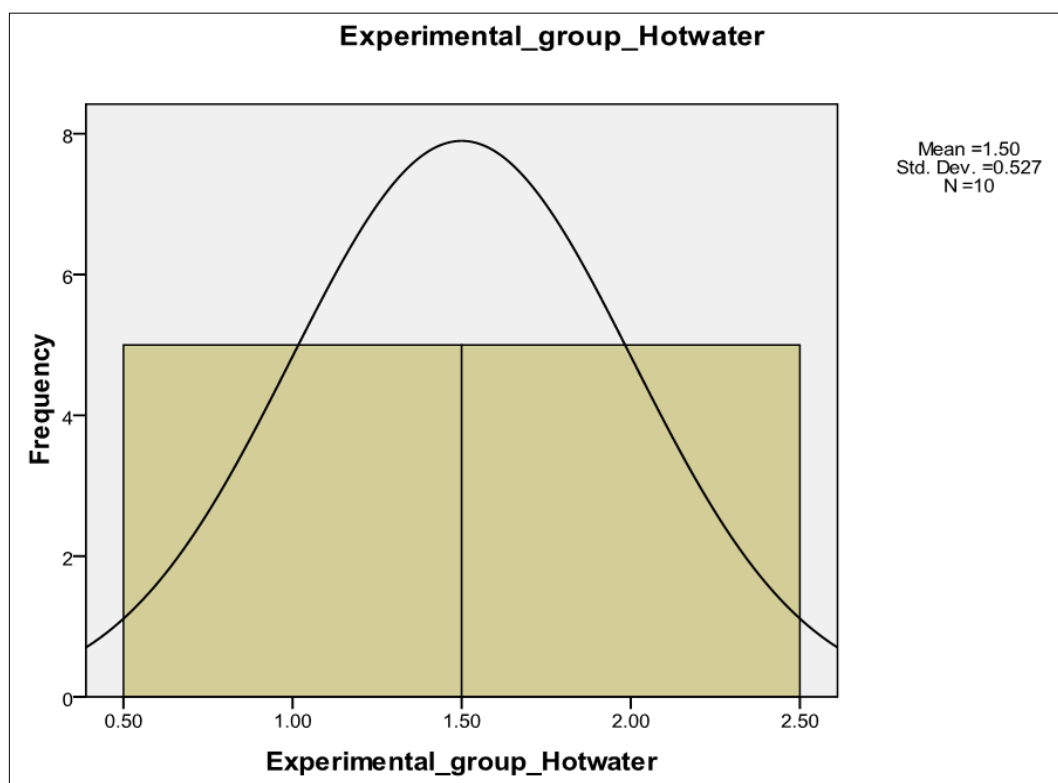


Fig 1: Graphical Representation of lactic acid for Experimental after the anaerobic training workout

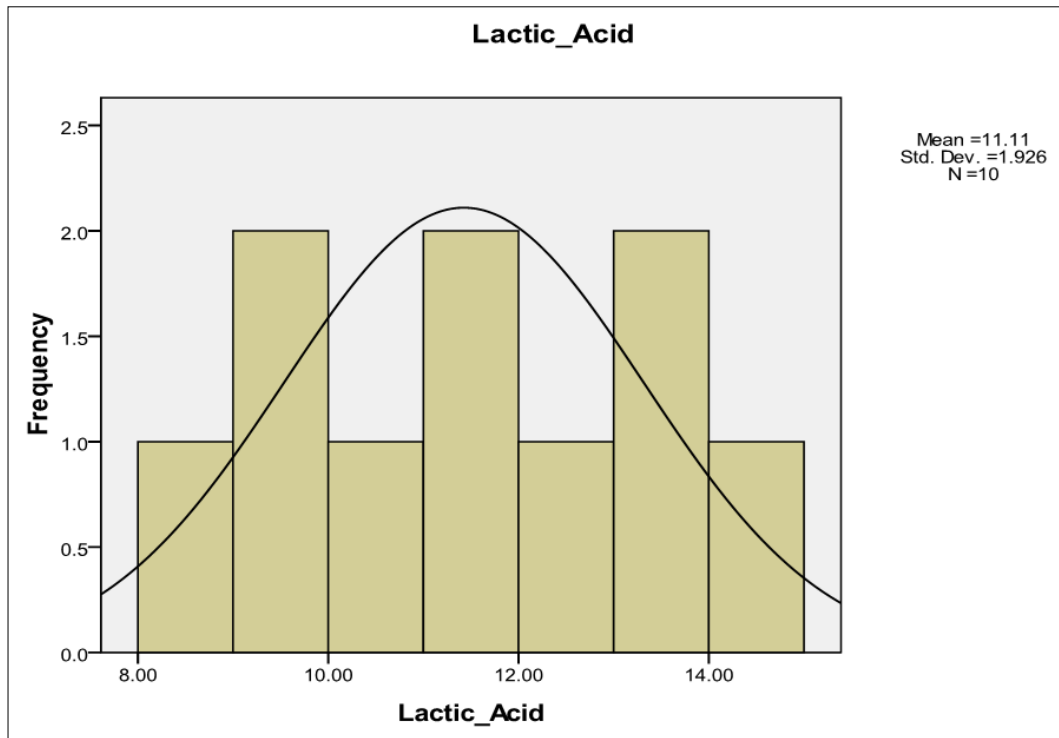


Fig 2: Graphical Representation of lactic acid for Experimental after the anaerobic training workout

Discussion of Finding

About the Recovery, it can be interpreted as, the word used to clarify the adaptations to workloads after an athlete has been exposed to training or competition. In simple terms, it is the time required for the repair of damage to the body caused by training or competition. In between the training sessions, much of the time is required for the recovery, it is well said that the athlete's recovery depends upon the time duration in between the training sessions and nature of the activity perform by the athletes in last sessions. If the athlete is performed high intensity training program then it required more time to recover. (Hooper, 1997) [8]. So, to understand the pattern of recovery through the lactic acid responses by applying the hot water, the present investigation was carried out and to fulfill the objectives of the study a total of 10 (Ten) male senior state level hockey players, (5 in each group i.e. 05 Hot water emersion, 05 control group) age ranged from 18 to 25yrs, was purposively selected from Rupnagar hockey academy of the Punjab state. The minimum training age of the participants was two years. All the participants were enquired about their medical history and also they were requested to report any other condition, which causes them long 'term or short term problems in exercise. In the consultation with the experts in the field, minutely gleaning through the literature available and considering the feasibility criteria in mind, especially the availability of equipment. The 'Lactic acid' was considered as the physiological variable in the present study. Data were collected on each and every participant from each group, the obtained data was analyzed by applying t statistics at level of significance 0.05. Results indicates a that there was a significant difference in the lactic acid responses. After anaerobic training workout as the p-value (.000) was less than 0.05 level of significance and t statistics value is 3.98 which is higher than the tabulated value at degree of freedom 2 and 8. Hence, on basis of the results it can be concluded that there is an effect of hot water treatment (five minutes) in the reduction of lactic after an aerobic training workout.

Throughout history, warm and hot water treatments have been used for muscle relaxation after physical exertion. Immersion

of the body in 34–36 °C water results in marked changes in the circulatory, pulmonary, renal and musculoskeletal systems as a result of increased hydrostatic pressures. The effects have been shown to be most pronounced for whole body (head out) immersion rather than partial immersion as increased pressure is proportional to the size of the immersed body surface area parts. Some studies have attempted to evaluate the influence of warm or hot water immersion of whole body or legs only on post exercise recovery. The legs-only immersion study found negligible effects on recovery parameters and were inferior compared with whole body immersion. Furthermore, Overworked muscles and buildup of lactic acid are what cause the pain associated with exercising. When heat is applied to a sore area of the body, blood vessels widen and blood flow increases to transport excess lactic acid and other toxins away from tired muscles. Applying heat to an inflamed area will dilate the blood vessels, promote blood flow, and help sore and tightened muscles relax. Improved circulation can help eliminate the buildup of lactic acid waste occurs after the high intensity exercises. Heat therapy is usually more effective to reduce the lactic acid after the heavy workout.

In 2006, a team of researchers found Trusted Source that athletes with muscle pain who exercised and use continuous hot water perform better in sports. Some people use heat treatment, often in the form of a hot bath, to stave off the Delay onset Muscular Soreness.

A similar study was conducted by Darry Cochrane, 2004, he investigated whether alternating hot – cold water treatment is a legitimate training tool for enhancing athlete recovery, and results examined the effectiveness of hot– cold water immersion for post exercise treatment.

The results or methodology used in these all the studies was adopted in the present study which gives a strong support in relation to fulfill the purpose of present study.

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