

# **The Change of Blood Lactate Level Because of The Sport Massage and Circulo Massage Manipulation After Physical Exercise**

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## **ABSTRACT**

The goal of this research is to know the effect of massage manipulation technique sport massage and circulo massage on leg for the changes of levels blood lactate. This research uses the randomized pretest-posttest control group design.

This research pick up 20 samples that is taken randomly, and than divided into 2 group: massage technique sport massage and massage technique circulo massage. The data of levels blood lactate is taken before subjects do activity, immediately after physical activities, after 5 minutes of massage manipulation technique sport massage and circulo massage, and after 10 minutes taken from the samples finger.

Data can be taken from the research result and processed by using the descriptive statistic, normality test, homogeneity test, anova test with the significant level 5% computerizing tested by SPSS program. The result that can be obtained shows: 1) that wasting rate velocity lactate of muscle to blood massage manipulation technique sport massage mean: 0,232 mMol/l/minutes and wasting rate velocity lactate of muscle to blood massage manipulation technique circulo massage mean: 0,438 mMol/l/minutes and 2) that wasting rate velocity of blood lactate massage manipulation technique sport massage mean: 0,258 mMol/l/minutes and wasting rate velocity of muscle lactate to blood lactate massage manipulation technique circulo massage mean: 0,542 mMol/l/minutes. Conclusion: 1) massage manipulation technique circulo massage waste lactate from muscle to blood faster than massage manipulation technique sport massage and massage manipulation technique circulo massage waste lactate from blood faster than massage manipulation technique sport massage.

**Key words:** massage, lactate

## **INTRODUCTION**

Many kinds of physical exercises which is done by using high intensity can cause the increase of lactate acid level in the muscle or in the blood. The increase of lactate acid level can cause to the decrease of pH. The decrease of pH (Low pH) will influence the maximal capability of fiber muscle, decline of physical activity dan one of the factor



that cause the tiredness (Coast, 1995). to decrease the tiredness happens, the lactate acid level of the blood and muscle have to cleaned soon until the normal limit (Falk, 1995).

The lactate hoarding in the blood becomes a basic problem in the physical activity because it can make a chronic tiredness and decrease the physical activity (Ahmaidi, 1996; Wilson, 1998). The late of throwaway lactate causes the physical defect even in a while or permanent (Peterson, 1990). The form of activity that can make the restore of lactate quickly is the increasing of oxidation process and gluconeogenesis, its involve many of red muscle fiber and speed the distribution of lactate into the liver (Falks, 1995; Bangsbo, 1997; Brook, 1999).

Lactate restore mechanism from the bood and muscle influnced by the activity which done after the maximal activity (Golnick, 1986). This case will influence the output of lactate mechanism from the muscle into the blood, the increase of blood flowing, the take of lactate by the liver, heart, and the muscle skeleton (Weltman, 1981). The speed of lactate output will influence the next metabolism process, so that the lactate can immediately remetabolismed and forming the energy through the krebs cycle (Bangsbo, 1994). According to Falks (1995). The important thing of lactate restore is increase the blood flowing, increase the cardiac output, increase the lactate transport, so that the reforming energy can go immediately.

According to Hinds T, McEwan I, and Perkes J research, from the data have got that massage can cause the increasing of blood artery flowing, and the increasing of blood flowing in the skin. The relevan research which done by Mori H, Ohsawa H, and Tanaka TH, convey that there is a significant different from the observation between the massage and the rest condition om the VAS to the muscle tiredness. Theoretically,



massage could help the increasing of blood flowing in the muscle skeleton as a speedy ways in the lactate flowing level in order to be eliminated to the other places, so that the massage can used as a technique to lactate cleaning immediately (Nancy A. Martin and Robert J. Robertson, 1998: 30-35).

According to the observation result, there are many types of massage faced, such as sport massage and circulo massage. However, there is no research result done before which is talk about the types of massage gives to the athlete after doing exercise or have a match that can decline the lactate acid level effectively.

This condition gives an opportunity to the writer to conduct research about the massage techniques for decline the lactate acid level. According to many case above, research about the influence of restoring by manipulation sport massage and the restoring by doing manipulation circulo massage toward the change of blood lactate level after doing submaximal exercises need to be done.

## **RESEARCH METHODOLOGY**

The type of research that will done is experimental laboratoris research method. This research using ”randomized pretest- posttest control group design” plan.

The population of the research is the students of Sport Science Program of Sport Science Faculty in Yogyakarta State University year 2004 and 2005. Male students with the age between 21- 23 years old, not an athlete and in a good condition.

This research use analysis data technique with descriptive statistic, normal experiment, homogeneity experiment and 5 % anova significant level. Statistic experiment above using SPSS program and computerize



## RESEACH FINDING AND DATA ANALYSIS

### The Anova experiment finding of blood lactate level among the group in every measuring

The different experiment finding (Anova) toward the beginning of lactat level variable, post- exercise lactate level , post massage lactate level and post- rest lactate level are seen in the tabel below:

**Tabel: Description Data and the finding of lactate level different experiment in every measure**

	(Early lactate)	post- exercise lactate	<i>post-massgae lactate</i>	post- rest lactate
Sport Massage	1,93	9,05	10,21	8,92
Circulo Massage	1,99	8,99	11,18	8,47
Anova	$p>0,05$	$p>0,05$	$P<0,05$	$P<0,05$

From the finding above, it shows that no real differential ( $p>0,05$ ) on the early lactate and post-exercise lactate level measure among the treatment group. The tabel data above give the finding that there is a real differential ( $p<0,05$ ) on the post massage and post-rest lactate level measure.

### Anova Experiment finding toward the change of Blood lactate Level among the group

The result of differential experiment (anova) toward the blood lactate level variable increase in post exercise, blood lactate level increase in post massage, and blood lactate level decrease in post-rest among the group gives the result that there is no important difference ( $p>0,05$ ) among the change of blood lactate level on the increase

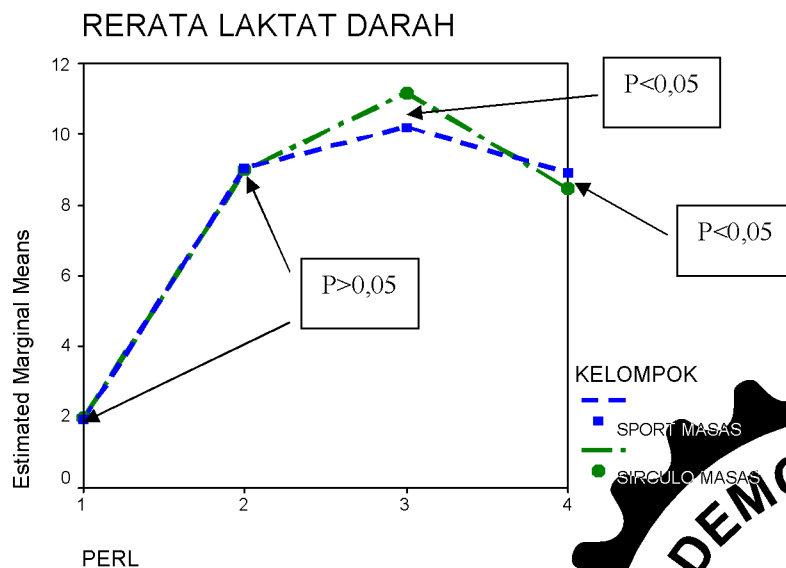


lactate variable in post exercise. Meanwhile, there is an important difference ( $p < 0,05$ ) on the increase lactate variable in post massage and the lactate post rest decrease in the change blood lactate level among the group, It can be seen in the tabel below:

**The Tabel of Means Changes Levels Blood Lactate Groups Sport Massage and Circulo Massage**

Variable	Groups	Mean	F	P
Lactate Increase Post exercise	SPORT MASAS CIRKULO MASAS	7,120 7,000	0,232	$> 0,05$
Lactate Increase Post Massage	SPORT MASAS CIRKULO MASAS	1,160 2,190	28,647	$< 0,05$
Lactate Down Post Rest	SPORT MASAS CIRKULO MASAS	1,290 2,710	33,870	$< 0,05$

for further information, look at the picture below



## The Result of Varians Unvariati Analysis Lactate velocity Elimination

From the varians univariat finding of the lactate velocity elimination gives the result that there is an important difference ( $p < 0,05$ ) between the lactate velocity elimination from muscle to the blood among sport massage treatment group and circulo massage group treatment, gives the result that there is an important difference ( $p < 0,05$ ) between the lactate velocity elimination from the blood of sport massage treatment group and circulo massage treatment group, and there is no important difference ( $p > 0,05$ ) on the total lactate velocity elimination, it can be seen in the tabel below:

**Tabel: The finding of Varians Univariat Analysis**

Source	Variable	DB	F	P
Groups	lactate velocity elimination from the muscle	1 / 18	28,647	< 0.05
	lactate velocity elimination from the blood	1 / 18	33,870	< 0.05
	Total lactate velocity elimination	1 / 18	3,142	> 0,05

## DISCUSSION

### Early Lactate Level ( Before the physical activity)

From the research that have done shows that the mean of people blood lactate acid level is about 1,96 mMol/l for male, in the age of about 21-23 years old, in the weight of about 56-67 kg and in the height of about 167-173 cm. Blood lactate acid level can used as a parameter to knowing the physical activity respon. From that reason, this research use the measurement of rest lactate acid level do before the physical activity.



The measure result by using Test-t independent to the rest blood lactate acid level shows that there is no important difference between the early blood lactate acid level (rest) on the sport massage group manipulation in the first measurement (early) and the early blood lactate acid level (rest) on the circulo massage manipulation group.

That condition gives an illustration that rest lactate acid level on the sport massage manipulation group and circulo massage manipulation group in the first measure done (early) have an equal value (homogen). Besides the data above, there is also data shows that lactate acid level from each individual have an equal value (homogen). So, if there are a difference blood lactate acid level after sub maximal physical exercise, after giving massage manipulation, and blood lactate acid level restoration not because of the early different condition, but it because of the influence of the tretment that given to the people.

### **Blood Lactate Level After Physical exercise**

According to the differential experiment result (anova) among the treatment group in this research shows that nothing importance differentiation between the maximal blood lactate acid level on the sport massage and circulo massage groups. This condition illustrate that the people maximum ability in every group have an equal value. The difference of the blood lactate acid level after doing the restoration is an affect from the treatment given to the people. According to the mean value of early blood lactate acid level, maximum blood lactate acid level, blood lactate acid level after manipulation massage given, and blood lactate acid level after the restoration, shows that the increase of blood lactate acid level before doing the physical activities and after doing maximal



physical activities. This case shows that physical activities done have a respon to the increase of metabolism to fill the energy needed.

**The influence of restoration by Circulo Massage and Sport Massage manipulation towad the change of Blood Lactate Acid Level During 5 minutes time restoration.**

Mean of blood lactate levels after physical activity hardvard step test until 2 minute by intensity metronome 120 time per minute and high chair 35 cm and after physical activity manipulation which circulo massage and sport massage during 5 minute any increase.

According to the result of differential experiment (anova) among the treatment group in this research shows the importance differentiation between blood lactate acid level after give massage on the sport massage and circulo massage groups ( $p < 0,05$ ).

The increase of blood lactate acid level after give massage during 5 minutes higher on the circulo massage group is 2,190 mMol/l while the increase of blood lactate acid level on the sport massage group is 1,160 mMol/l. The mean of blood lactate acid level after the restoration with sport massage and circulo massage manipulation during 5 minutes shows its raising than when the submaximum physical activities do. This increase cause because of the lactate that forming during submaximum physical activities diffusion to the blood, so that the blood lactate acid level increase (Guyton, 1996). The increase of blood lactate acid level on the circulo massage manipulation group is higher it is because circulo massage manipulation helps the lactate velocity elimination immediately from the muscle to the blood flowing by increase the cellular permaebility (make the lactate acid eliminate from muscle easier). Circulo masage manipulation is also





increase the mechanism of the vena pump and limfe pump artificially in order to restore the circulation velocity immediately. By the activation of muscle pump system, blood velocity sirculation happens in the active muscle. Beside that the lacatate velocity elimination from the muscle to the bloog is higher on the circulo massage group. This is caused by the main target from circulo massage is on the blood circulation and the techniques used with the circuler movement. So that, the increase of the output of metabolism result from the muscle to the blood circulation will happens and the velocity of lacatate metabolism by the organ which is netralize. Circulation velocity helps the immediate restoration (in a sport activity) by the all immediate supply of essence needs and the velocity of lactate acid ellimination. (Giriwijoyo S dan Muchtamadji M A, 2006: 273).

## **CONCLUSION**

From the research finding that have done, it can conclude as follows : 1) The restoration by sport massage manipulation can increase the blood lactate acid level after the submaximum physical exercise, 2) The restoration by circulo massage manipulation can increase the blood lactate acid level after submaximum physical exercise, and 3) the restoration by circulo massage manipulation more immediate the increase of blood lactate acid level if we compare with the sport massage manipulation after the submaximum physical exercise.



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