PENGARUH PEMULIHAN AKTIF DI AIR HANGAT SETELAH AKTIVITAS FISIK SESAAT TERHADAP PENURUNAN KADAR ASAM LAKTAT PADA TIKUS PUTIH (*RATTUS NORVEGICUS)*

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LACTIC ACID; RATTUS NORVEGICUS
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ABSTRAK

PENGARUH PEMULIHAN AKTIF DI AIR HANGAT SETELAH AKTIVITAS FISIK SESAAT TERHADAP PENURUNAN KADAR ASAM LAKTAT PADA TIKUS PUTIH (*RATTUS NORVEGICUS)*

PENELITIAN EKSPERIMENTAL LABORATORIUM

Pemulihan aktif merupakan salah satu cara untuk menurunkan kadar asam laktat darah setelah latihan, namun pemulihan aktif yang dilakukan pada air hangat belum terlalu dikenal. Penelitian ini bertujuan untuk mengetahui pengaruh pemulihan aktif di air hangat terhadap penurunan kadar asam laktat darah setelah aktivitas fisik. Rancangan yang digunakan adalah *The Separate Sample Pre test - Post test Control Group Design.*
Pada penelitian ini menggunakan 28 ekor tikus putih *Rattus norvegicus* jantan, umur 2-3 bulan, sehat, berat badan 150-250 gram. Sampel secara acak dibagi menjadi 4 kelompok, K_{01},K_{02}, K_1dan K_2 untuk diukur kadar asam laktat darahnya. Selanjutnya ke empat kelompok diberi perlakuan yang berbeda-beda sesuai dengan kelompoknya. Kelompok K_{01}(Kelompok kontrol) tidak diberi perlakuan apapun sedangkan K_{02} diberi perlakuan berupa program aktivitas fisik sesaat, dan kelompok K_1 serta K_2 di diberi perlakuan berupa program aktivitas fisik sesaat dan perlakuan pemulihan air hangat (suhu 35-37^oC) untuk kelompok K_1 dan air suhu ruang (suhu <31^oC) untuk kelompok K_2. Program latihan fisik sesaat dalam penelitian ini aktivitas renang di air tawar mencapai 80% kemampuan kerja maksimal dan beban 9% berat badan. Program pemulihan aktif dilakukan segera setelah aktivitas fisik sesaat,dalam kondisi latihan renang tanpa beban selama 5 menit.
Data hasil penelitian setelah pemulihan aktif di air hangat menunjukkan kadar asam laktat 7,86 ± 0,81 mMol/l (5 menit) menjadi 5,10 mMol/l (15 menit) sedangkan pada pemulihan air suhu ruang kadar asam laktat 5,36 ± 0,82 mMol/l (5 menit) menjadi 7,53 mMol/l (15 menit). Data diolah dengan menggunakan statistik diskriptif dan statistik inferensial (uji normalitas, uji homogenitas, uji anakova dan LSD (*Least Significant Difference)* serta t test independent) dengan taraf signifikan 5%. Hasil Anova terhadap respon perubahan kadar laktat akibat perlakuan pemulihan air hangat dihasilkan nilai p = 0,00 (F = 127,117).

Dan setelah *t Test Independent*, terdapat penurunan nilai kadar asam laktat sebesar -2,757 mMol/l pada kelompok pemulihan dia air hangat secara bermakna (p=0,00) antara K_1 dan K_2. Dengan demikian dari penelitian ini dapat disimpulkan bahwa penurunan kadar asam laktat darah lebih besar pada pemulihan aktif di air hangat dibanding pemulihan aktif di air suhu ruang.

Kata kunci : asam laktat, pemulihan aktif dan air hangat.

ABSTRACT

EFFECT OF ACTIVE RECOVERY IN WARM WATER AFTER ACUTE EXERCISE ON THE REDUCTION OF LACTIC ACID CONCENTRATION IN WHITE RATS (*RATTUS NORVEGICUS*)

A LABORATORY EXPERIMENTAL STUDY

Active recovery is one method to reduce post-exercise blood lactic acid concentration. However, active recovery performed in warm water has not been well-recognized. The objective of this study was to find the effect of active recovery in warm water on the reduction of post-exercise blood lactic acid concentration. This study employed separate sample pre-test post-test group design.

This study used 28 male healthy *Rattus norvegicus* white rats aged 2-3 months, with body weight of 150-250 grams. Samples were selected randomly divided into four groups, K_{01}, K_{02}, K_1 and K_2, to be subjected to blood lactic acid concentration measurement. The four groups received different treatment. K_{01} (control group) received no treatment, while the group K_{02} received acute exercise program. Groups K_1 and K_2 received treatments of acute physical exercise and warm water recovery. The temperature for K_1 was of 35-37 degree C and water in room temperature (< 31 degree C) for K_2. Acute physical exercise in this study was swimming activity in fresh water, which achieving 80% of maximum working capacity and a load of 9% of body weight. Recovery program, comprising swimming exercise without load for 5 minutes, was performed immediately after physical exercise.

Result revealed that after active recovery in warm water, the concentration of lactic acid became 5.10 mMol/l and in recovery with water in room temperature, it became 7.53 mMol/l. Data were processed using descriptive statistics and inferential statistics (normality test, homogeneity test, anacova test, LSD [least significant difference] test, and independent t test), with significance level of 5%. Results of Anova test on the response of the change of lactic acid concentration resulting from warm water recovery treatment revealed p = 0.00 (F = 127.117). Independent t test revealed reduction of lactic acid concentration of -2.757 mMol/l in group receiving recovery treatment in warm water. Both group showed significant difference (p = 0.00) in that treatment. In conclusion, the reduction of blood lactic acid concentration was higher in active recovery with warm water than that with water in room temperature.

Keywords: lactic acid, post-exercise active recovery, warm water