Peran Latihan Fisik terhadap Tekanan Darah, Kadar ENOS, TGF-ß1, Elektrokardiogram, dan Ketebalan Miokardium pada Model Tikus Hipertensi yang diinduksi L-NAME = Effect of Physical Exercise on Blood Pressure, eNOS and TGF--ß1 Levels, Electrocardiogram, and Myocardial Thickness in L-NAME-induced Hypertension Rat Model

Monica Dwi Jalma, author

Abstrak

Peningkatan angka kejadian hipertensi di dunia telah menjadi ancaman kesehatan global. Latihan fisik metode HIIT dan MICT mampu menurunkan tekanan sistolik, diastolik dan tekanan rata-rata arteri. Tujuan penelitian kali ini ingin mengetahui perbedaan efek HIIT dan MICT terhadap kadar eNOS dan TGF-ß1,gambaran EKG dan ketebalan miokardium dengan menggunakan model tikus hipertensi yang diinduksi NOS Inhibitor. Hipertensi diinduksi dengan pemberian L-NAME 40 mg/kg/hari pada tikus jantan galur wistar melalui sonde pada kelompok B, C, dan D, selama lima minggu. Setiap minggu dilakukan pengukuran tekanan darah dan pengukuran berat badan. Intervensi latihan fisik HIIT dan MICT dilakukan lima hari dalam seminggu selama lima minggu. Kadar eNOS dan TGF- ß1 diuji menggunakan metode ELISA. Analisa EKG dilakukan dengan menghitung durasi interval QRSp. Analisis histologi dengan pewarnaan HE dilakukan untuk pengukuran tebal dinding jantung. Hasil penelitian menunjukkan terdapat peningkatan tekanan darah (p = 0.001) dari minggu ke minggu dan pemanjangan durasi QRSp (p = 0.000) pada kelompok yang diberikan induksi. Peningkatan tekanan darah pada kelompok yang diberikan latihan fisik lebih kecil dibandingkan kelompok tanpa latihan fisik. Ketebalan miokardium kelompok induksi lebih tinggi dibandingkan kelompok kontrol tanpa induksi. Pada penelitian ini, tidak ditemukan perbedaan tekanan darah, durasi QRSp, kadar eNOS, kadar TGF-ß1dan ketebalan dinding jantung, antara kelompok yang diberikan perlakuan HIIT dengan MICT. Dapat disimpulkan bahwa latihan fisik baik HIIT dan MICT dapat menekan peningkatan tekanan darah, namun tidak ditemukan perbedaan EKG, kadar eNOS dan TGF-ß1serta ketebalan miokardium, antara HIIT dan MICT pada tikus yang diinduksi dengan L-NAME.
.....The increasing incidence of hypertension in the world has become a global health threat. HIIT and MICT physical exercise methods can reduce systolic, diastolic, and mean arterial pressure. This study aimed to determine the differences in the effects of HIIT and MICT on eNOS and TGF-ß1 levels, ECG features, and myocardial thickness using a rat model of NOS inhibitor-induced hypertension. Hypertension was induced in Wistar male rats by administering L-NAME 40 mg/kg/day via probe for five weeks in the B, C, and D group. Every week blood pressure and body weight are measured. HIIT and MICT physical exercise interventions were carried out five days a week for five weeks. eNOS and TGF-ß1 levels were tested using the ELISA method. ECG analysis is carried out by calculating the duration of the QRSp interval. Histological analysis with HE staining was performed to measure heart wall thickness. The results showed that there was an increase in blood pressure (p=0.001) from week to week and a lengthening of QRSp duration (p=0.000) in the group given induction. The increase in blood pressure in the group given physical exercise was smaller than in the group without physical exercise. Myocardial thickness in the induction group was higher than in the control group without induction. In this study, there were no differences in blood pressure, QRSp duration, myocardial thickness, eNOS levels, or TGF-ß1 levels between the groups

given HIIT and MICT treatment. It can be concluded that physical exercise, both HIIT and MICT, can reduce increases in blood pressure, but there are no differences in eNOS, and TGF-ß1 levels, ECG andmyocardial thickness, between HIIT and MICT in mice induced by L-NAME.