

THE EFFECTS OF HIGH INTENSITY INTERVAL TRAINING (HIIT) AND MODERATE INTENSITY INTERVAL TRAINING (MIIT) ON BLOOD GLUCOSE AND INSULIN IN OBESITY RATS

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ABSTRACT

Obesity is a global health problem and must be handled properly because it can increase the risk of various health problems. In obesity there is a chronic low-grade inflammation that triggers insulin resistance. Physical exercise is thought to be able to deal with inflammation that occurs in obesity. Currently, interval training is widely recommended, but it is not known whether high or moderate intensity is safer and more effective. This study aimed to compare the effects of high intensity interval training (HIIT) and moderate intensity interval training (MIIT) on blood glucose and insulin levels in obese rats.

This study is an experimental laboratory study with a pretest-posttest control group design. Subjects consisted of 28 male Wistar rats with obese condition divided into three groups, HIIT, MIIT and the control group. The exercise intervention was given for 6 weeks with a frequency of 4 times per week, HIIT intensity (90-95% of baseline ability) and MIIT (65-70% of baseline). Before and after treatment, blood glucose and insulin levels were measured. Blood glucose levels were measured using a glucometer and insulin levels were determined using a standardized ELISA (Enzyme-linked immunosorbent assay) method. The data analysis technique used the ANOVA difference test for data with normal distribution and Kruskal Wallis for data with abnormal distribution.

The results showed that in the end of treatment, the body weight of the subjects in the HIIT group was significantly lower than the control group ($p=0.012$), but not significantly different from the MIIT group ($P>0.05$). The MIIT group was not significantly different from the control group ($p>0.05$). Fasting blood glucose levels after 6 weeks of treatment in the HIIT and MIIT groups were significantly lower than the control group. For insulin parameter, the difference of insulin levels in the HIIT and MIIT groups was significantly higher than the control group ($p=0.000$ and 0.002 , respectively). The difference in levels of HOMA-IR (homeostasis model assessment of insulin resistance) in the HIIT and MIIT groups was significantly lower than the control group ($p<0.05$). It can be concluded that physical exercise, both HIIT and MIIT could improve insulin resistance in obesity rat.

Kata Kunci: *interval training, insulin resistance, obesity.*