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The Effects of High Intensity Interval Training (HIIT) on Insulin Sensitivity in Individuals with a Family History of Type 2 DIABETES

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We investigated the influence of a family history of type 2 diabetes (T2DM) that affects insulin sensitivity following two weeks of HIIT. We also examined the relationship between the insulin sensitivity and lipid profile. A family history of T2DM is one of three risk factors that start the underline problem of chronic diseases.

Methods: An oral glucose tolerance test (OGTT) was used to measure fasting plasma glucose, 2-hour plasma glucose, and A1c. Subjects performed progressive ramp exercise on an electromagnetically braked stationary bike for the determination of their fitness level. Subjects were separated into one of two groups, such as Group 1: Healthy individuals (H-H) (n=9) and Group 2: A Family History of T2DM (H-FHx) (n=10). High intensity interval training (HIIT) consisted of 10 bouts of exercise on a cycle ergometer for 60 seconds at an intensity of 85% or above peak W from the progressive ramp exercise. Each bout of exercise is followed by 60 second of recovery consisting of pedaling with 30 W. Subjects

completed 6 sessions in 2 weeks (3 times a week). Then, OGTT was repeated.

Results: Insulin sensitivity in H-H versus H-FHx between pre-test and post-test (Mean \pm SEM) was 56.9 ± 5.8 and 55.4 ± 4.7 versus 58.6 ± 6.4 and 58.2 ± 5.5 ($P > 0.05$). The OGTT was not statistically significant ($P > 0.05$).

However, insulin sensitivity was predicted from lipid profile, such as a linear combination of high-density lipoprotein (HDL) and low-density lipoprotein (LDL), in a family history of T2DM, and it was statistically significant ($P < 0.05$, $R^2 = 0.755$). However, any other variables of lipid profile in healthy individuals did not predict insulin sensitivity ($P > 0.05$).

Conclusions: A family history of T2DM did not influence insulin sensitivity after two weeks of HIIT. Thus, a family history of T2DM was not a primary factor. It is a new finding that the combination of HDL and LDL predicted insulin sensitivity in individuals with a family history of T2DM but healthy individuals.

Key words: high intensity interval training, insulin sensitivity, a family history of type 2 diabetes mellitus