Exercise-Induced Improvement in Oxygen Consumption at Ventilatory Threshold is Unaffected by Family History of Diabetes

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ABSTRACT

A family history of type 2 diabetes (FH+) has been reported to increase the risk for insulin resistance. However it is unknown whether a family history of diabetes impairs lipid oxidation capacity. **PURPOSE**: To investigate if FH impacts lipid oxidation capacity and oxygen consumption at ventilatory threshold (VT). Additionally, we investigated the effects of 8 weeks of combined exercise training on resting lipid oxidation and oxygen consumption at VT in healthy, sedentary, Mexican American males with and without (FH-) a family history of type 2 diabetes**. METHODS**: 19 sedentary, normoglycemic, Mexican American males underwent 8 weeks of combined exercise training three times per week for 8 weeks (35 minutes of aerobic exercise (60-75% VO_{2max}) & 45 minutes of resistance exercise). Lipid oxidation was determined using indirect calorimetry. Maximal aerobic capacity (VO_{2max}, L/min) was measured by respiratory gas exchange during a maximal incremental treadmill exercise test. VT was determined from the VO_2 data collected during the VO_{2max} test. **RESULTS**: There were no differences in fasting lipid oxidation measured by RQ at baseline between groups (p=0.44). Exercise training did not change fasting lipid oxidation regardless of FH (mean±SEM: FH- 0.72 ± 0.01 to 0.70 ± 0.20AU; p=0.20; FH+ 0.71 ± 0.01 to 0.72 ± 0.02AU; p=0.33). There were no differences in oxygen consumption at VT between groups at baseline (p=0.82). Following 8 weeks of combined exercise training, both groups improved oxygen uptake at VT (FH-: 1.85 ± 0.06 to 2.12 ± 0.11 L/min; p=0.006; FH+:1.82 ± 0.12 to 2.05 ± 0.13 L/min; p=0.002). FH+ improved VO_2max (3.57 ± 0.16 to 3.82 ± 0.16 L/min; p=0.002), whereas no improvement was observed in FH- (4.08 ± 0.15 to 4.21 ± 0.17 L/min; p=0.16). **CONCLUSION**: A family history of type 2 diabetes does not impact resting lipid oxidation and oxygen consumption at the ventilatory threshold in a sedentary normoglycemic Mexican American population.