Brisk Walking Restores Muscle Function in Diabetics

According to a new study in Type 2 diabetes, a moderate-intensity exercise program, such as brisk walking for 30 minutes three-to-five times a week, combined with moderate weight loss is enough to restore mitochondrial content and function to skeletal muscle.

Dr. Frederico G. S. Toledo and colleagues at the University of Pittsburg, before and after 4 months of exercise and weight loss, and colleagues obtained muscle biopsies to assess mitochondrial morphology, mitochondrial DNA content, and mitochondrial enzyme activities in 10 subjects with type 2 diabetes. The investigators also measured glucose control, body composition, aerobic fitness, and insulin sensitivity before and after intervention.

Baseline body mass index (BMI) was 34.0 kg/m2, mean weight was 99.5 kg, and hemoglobin A1C was 7.85%. After intervention, mean BMI was 31.9 kg/m2, mean weight was 92.4 kg, and hemoglobin A1C was 6.47%.

The mean weight loss was 7.1%, with a mean improvement in maximum aerobic capacity of 12%, Dr. Toledo's team reports. Insulin sensitivity improved 59%.

There were significant increases in skeletal muscle mitochondrial density of 67% and in mitochondrial oxidation enzymes. Cardiolipin content improved 55%.

Energy expenditure during physical activity correlated with the degree of improvement in insulin sensitivity and, in turn, improvement in mitochondrial content was a strong correlate of intervention-induced improvement in A1C and fasting plasma glucose," they write.

“It may only take a few weeks before the changes can be seen in the mitochrondrial”, says Dr. Toledo.
"We are confirming that the mitochondria play a key role in muscle dysfunction in diabetics and that we can ameliorate or even reverse the muscle dysfunction," he said. "We feel that it is important that the exercise be aerobic."

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