Is Exercise a New Year's Resolution for People Affected by Mitochondrial Diseases?

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Exercise intolerance is a hallmark characteristic of mitochondrial disease (Mito). Adults and children with Mito typically are unable to withstand intense physical activity, and often require more rest, oxygen, carbohydrates, and fluids following any physical activity. In other words, even low-impact or small amounts of exercise can leave a Mito patient feeling "wiped out", complaining of fatigue, shortness of breath, weakness and an increased heart rate (tachycardia). As a result, for years doctors have recommended maintaining a low activity level to their Mito patients.

So you think you get to be a couch potato because you have Mito? Not so fast. Turns out, a sedentary lifestyle may actually NOT be keeping your mitochondria functioning at their best. Recent studies published in the BioScience Reports (a publication of the Biochemical Society) in 2007 found that the mitochondrial function in muscle cells of people who were exercising was both more effective and more efficient. The idea of exercise training as a treatment for mitochondrial disease began after numerous research studies found beneficial effects of exercise on healthy mitochondria. However, the question remained: How will exercise impact patients with mtDNA defects?

The results are encouraging. Groups of mitochondrial disease patients who participated in 12-14 weeks of exercise experienced an overall benefit as a result of their increased activity. The benefits were similar for patients participating in various types of exercise as well, including endurance training, aerobic conditioning, or resistance training. As a result, exercise is now being considered a possible therapeutic approach for people with mitochondrial defects. According to the published studies, exercising patients demonstrated a higher baseline activity tolerance, less deconditioning and an overall better quality of life. Even more convincing, the beneficial effects experienced during the exercise training subsided when the exercise training was stopped. Mitochondrial function improves as a result of exercise, as shown by a better use of oxygen, nutrients, and efficient energy production.

It's still hard work. The theoretical and proven benefits of exercise don't change the hallmark characteristic of mitochondrial disease - fatigue. Exercising is really tough for many mitochondrial disease patients. Margaret Klehm, nurse practitioner in the metabolic clinic at Tufts New England Medical Center gave MitoAction members some advice about exercise training.

"Start slow, and be prepared to build up your tolerance very, very slowly," she says. "Endurance exercises, like swimming, walking or stationary bicycling are best."

Always stop the activity before you or your child experiences pain. Resistance exercises, like leg lifts or resistance bands, are also useful.

Don't be afraid to try something new, start slowly, and be realistic about how much you or your child can tolerate while slowly increasing the intensity and duration of the activity. For mitochondrial disease patients, doing this over time (months) can actually improve the individual's baseline (baseline refers to the amount of activity that can be typically tolerated without experiencing negative symptoms, such as extreme fatigue, pain, shortness of breath, etc.).

More research is needed, but the proven benefit of both mitochondrial function as well as ability to tolerate activity is encouraging to adults and children who have mitochondrial disease. Consult with your doctor or physical therapist to create an exercise plan that makes sense, and plan to literally, "take it one step at a time".