

High-intensity strength training shows benefit for Parkinson's patients

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(Medical Xpress)—Researchers at the University of Alabama at Birmingham say that high-intensity strength training produced significant improvements in quality of life, mood and motor function in older patients with Parkinson's disease. The findings were published Jan. 9 online in the *Journal of Applied Physiology*.

Fifteen subjects with moderate Parkinson's underwent 16 weeks of high-intensity resistance training combined with interval training designed to simultaneously challenge strength, power, endurance, balance and mobility function. Before and after the 16 weeks, the subjects were compared to age-matched controls who did not have Parkinson's and did not undergo the exercise regimen.

"We saw improvements in strength, muscle size and power, which we expected after rigorous weight training; but we also saw improvement in balance and muscle control," said Marcos Bamman, Ph.D., professor in the Department of Cell, Developmental and Integrative Biology and lead author of the study. "We also saw improvement in cognition, mood and sense of well-being."

Parkinson's disease is a debilitating, neurodegenerative disease that dramatically affects mobility function and quality of life. Patients often experience weakness, low muscle power and fatigue.

Bamman, who heads the UAB Center for Exercise Medicine, devised a strenuous exercise regimen for the participants. Subjects performed three sets of eight to 12 repetitions of a variety of strength training exercises, such as leg or overhead presses, with a one-minute interval between sets for high-repetition, bodyweight exercises, such as lunges or pushups.

"We pushed these patients throughout the exercise period," said Neil Kelly, M.A., a graduate student trainee and first author of the study. "We used a heart rate monitor to measure exercise intensity—keeping the heart rate high through the entire 40-minute session."

Bamman says this was the first study of its kind to look at the biology of the muscles. Biopsies of muscle tissue were collected before and after the 16 weeks.

"We found favorable changes in skeletal muscle at the cellular and subcellular levels that are associated with improvements in motor function and physical capacity," Bamman said.

Physicians who treat Parkinson's patients, such as UAB's David Standaert, M.D., Ph.D., chair of the Department of Neurology, say they have long believed that exercise is beneficial to their patients.

"What we do not know is what kind of exercise and how much exercise will prove best for individual patients with Parkinson's," Standaert said. "This study is concrete evidence that patients can benefit from an [exercise program](#) and can do so rapidly in only 16 weeks."

Standaert says he hopes this study will open the door to a more complete understanding of the role of exercise in this patient population.

"My patients who participated in the study told me that they enjoyed the [exercise regimen](#) and that they saw distinct improvement in their health and physical condition," he said. "Future studies should be able to help answer questions such as optimal frequency, intensity and type of exercise."

Study participants showed significant improvement of six points on average on a measure called the Unified Parkinson's Disease Rating Scale. On another measure, a seven-point fatigue scale, the group improved from a score above the clinical threshold for undue fatigue to a score below this threshold.

A sit-to-stand test showed that, after strength training, participants dropped from requiring 90 percent of maximum muscle recruitment to rise to a standing position to just 60 percent, which put them on par with their same-age, non-Parkinson's peers.

"These are all indications that [strength training](#) produced a major improvement in the ability to activate muscles, to generate power and to produce energy," Bamman said, "all of which can contribute to improved quality of life and reduction of injury risk from falls."

The study was funded by the UAB School of Medicine and the Department of Neurology, along with the UAB Center for Exercise Medicine. Bamman hopes the findings will pave the way for larger studies to define optimal [exercise](#) doses for Parkinson's patients across the disease spectrum.

"This is the first step in an important direction to maximize the therapeutic benefits of [exercise training](#) for people with Parkinson's disease," he said.

Provided by University of Alabama at Birmingham

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