

Value of exercise combination shown in diabetes study

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Performing a combination of aerobic exercise and resistance training has been found to improve glycemic levels among patients with type 2 diabetes, compared to patients who did not exercise, according to a study in the Nov. 24 issue of the *Journal of the American Medical Association*.

The level of improvement was not seen among patients who performed either aerobic exercise or resistance training alone.

Steve Blair, an Arnold School of Public Health researcher at the University of South Carolina, was one of the authors of the study, led by Timothy S. Church of the Pennington Biomedical Research Center of Louisiana State University.

Although it has been generally accepted that regular exercise provides substantial health benefits for individuals with type 2 [diabetes](#), the exact exercise type (aerobic vs. resistance vs. both) has been unclear, said Blair, who has faculty appointments in the Arnold School's Departments of Exercise Science and Epidemiology and Biostatistics.

"This research is supportive of the 2008 Physical Activity Guidelines from the U.S. Department of Health and Human Service," he said. "The study has significant clinical and public health implications."

Blair, Church and colleagues from the University of Missouri, Columbia, and Maastricht University Medical Center in the Netherlands conducted the HART-D trial, which included 262 sedentary women and men with type 2 diabetes. They studied the effect of aerobic training, resistance

training, and a combination of both on change in hemoglobin A1c levels.

HbA1c is a minor component of hemoglobin, the oxygen-carrying component of red blood cells, to which glucose (blood sugar) is bound. HbA1c levels are used to monitor the control of diabetes mellitus.

Study participants were 63 percent women, 47.3 percent nonwhite, average age of 56 years, HbA1c level of 7.7 percent and duration of diabetes of 7.1 years.

The individuals were enrolled in the nine-month exercise program between April 2007 and August 2009. Forty-one participants were assigned to the non-exercise control group; 73 to resistance training sessions; 72 to [aerobic exercise](#) sessions; and 76 to combined aerobic and resistance training.

The researchers found that the absolute change in HbA1c in the combination training group vs. the control group was -0.34 percent. In neither the resistance training (-0.16 percent) nor the aerobic (-0.24 percent) groups were changes in HbA1c significant compared with those in the control group. The prevalence of increases in hypoglycemic medications were 39 percent in the control, 32 percent in the resistance training, 22 percent in the aerobic, and 18 percent in the combination training groups.

Among the study's findings:

- Only the combination exercise group improved maximum oxygen consumption compared with the control group.
- All exercise groups reduced waist circumference from three-quarters of an inch to slightly more than an inch, compared with the control group.
- The [resistance training](#) group lost an average of 3.1 pounds fat mass

and the combination training group lost an average of 3.7 pounds, compared with the control group.

- Although both resistance and aerobic training provide benefits for people with type 2 diabetes, only the combination of the two were associated with reductions in HbA1c levels.

The study also found that that the follow-up difference in HbA1c between the combination training group and the control group occurred even though the control group had increased its use of diabetes medications while the combination training group decreased its diabetes medication uses.

The findings could change the recommendations that physicians and other health care professionals make for people with type 2 diabetes, Blair said.

"I hope that health professionals will give more attention to recommending a combination of aerobic and resistance exercise programs," he said. "This research does support the value of combined exercise regimens for patients with type 2 diabetes."

Provided by University of South Carolina

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