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Combining Aerobic and Resistance Training Appears Helpful for Patients with Diabetes

Performing a combination of aerobic exercise and resistance training was associated with improved glycemic levels among patients with type 2 diabetes, compared to patients who did not exercise, according to a study in the November 24, issue of JAMA. The level of improvement was not seen among patients who performed either aerobic exercise or resistance training alone.

Although it is 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. "Given that the 2008 Federal Physical Activity Guidelines recommend aerobic exercise, in combination with resistance training, the unanswered question as to whether for a given amount of time the combination of aerobic and resistance exercise is better than either alone has significant clinical and public health importance," the authors write.

Timothy S. Church, M.D., M.P.H., Ph.D., of Louisiana State University System, Baton Rouge, La., and colleagues conducted the HART-D trial, which compared among 262 sedentary women and men with type 2 diabetes the effect of aerobic training, resistance training, and a combination of both on change in hemoglobin A1c levels (HbA1c; a minor component of *hemoglobin* [the substance of red blood cells that carries oxygen to the cells] and to which glucose [blood sugar] is bound; HbA1c levels are used to monitor the control of diabetes mellitus). Study participants were 63.0 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 9-month exercise program between April 2007 and August 2009. Forty-one participants were assigned to the nonexercise control group; 73 to resistance training sessions; 72 to aerobic exercise sessions; and 76 to combine 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 was 39 percent in the control, 32 percent in the resistance training, 22 percent in the aerobic, and 18 percent in the combination training groups.

"Only the combination exercise group improved maximum oxygen consumption compared with the control group. All exercise groups reduced waist circumference from [-.75 to -1.1 inches] compared with the control group," the authors write. The resistance training group lost an average of 3.1 lbs. fat mass and the combination training group lost an average of 3.7 lbs., compared with the control group.

"The primary finding from this randomized, controlled exercise trial involving individuals with type 2 diabetes is that although both resistance and aerobic training provide benefits, only the combination of the 2 were associated with reductions in HbA1c levels," the researchers write. "It also is important to appreciate 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."

Ronald J. Sigal, M.D., M.P.H., of the University of Calgary, Alberta, Canada, and Glen P. Kenny, Ph.D., and Dr. Sigal of the University of Ottawa and Ottawa Hospital Research Institute, Ottawa, Ontario, Canada, write in an accompanying editorial that this study provides important evidence on the effects of aerobic and resistance training on improving hemoglobin A1c levels.

"Based on the results of the HART-D trial, patients with type 2 diabetes who wish to maximize the effects of exercise on their glycemic control should perform both aerobic and resistance exercise. The HART-D trial clarifies that, given a specific amount of time to invest in exercise; it is more beneficial to devote some time to each form of exercise rather than devoting all the time to just one form of exercise."

Editor's Note: This article is not intended to provide medical advice, diagnosis or treatment.