Structured exercise training associated with improved glycemic control for patients with diabetes

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Implementing structured exercise training, including aerobic, resistance or both, was associated with a greater reduction in hemoglobin A1c levels (a marker of glucose control) for patients with diabetes compared to patients in the control group, and longer weekly exercise duration was also associated with a greater decrease in these levels, according to results of an analysis of previous studies, published in the May 4 issue of *JAMA*.

"Exercise is a cornerstone of diabetes management, along with dietary and pharmacological interventions. Current guidelines recommend that patients with type 2 diabetes should perform at least 150 minutes per week of moderate-intensity aerobic exercise and should perform resistance exercise 3 times per week," according to background information in the article. "Regular exercise improves glucose control in diabetes, but the association of different exercise training interventions on glucose control is unclear."

Daniel Umpierre, M.Sc., of the Hospital de Clinicas de Porto Alegre, Brazil, and colleagues performed a systematic review and meta-analysis of previously conducted randomized controlled clinical trials (RCTs) of at least 12 weeks' duration that evaluated the ability of structured exercise training or physical activity advice to lower hemoglobin A1c (HbA1c) levels as compared with a control group in patients with type 2 diabetes. The researchers identified 47 RCTs (8,538 patients) that met

criteria for inclusion.

The researchers found that overall, structured exercise training (23 studies) was associated with a decline in HbA1c level (-0.67 percent) compared with control participants. In addition, structured aerobic exercise (-0.73 percent), structured resistance training (-0.57 percent), and both combined (-0.51 percent) were each associated with declines in HbA1c levels compared with control participants.

"Structured exercise durations of more than 150 minutes per week were associated with HbA1c reductions of 0.89 percent, while structured exercise durations of 150 minutes or less per week were associated with HbA1c reductions of 0.36 percent. Overall, interventions of physical activity advice (24 studies) were associated with lower HbA1c levels (-0.43 percent) compared with control participants. Combined physical activity advice and dietary advice was associated with decreased HbA1c (-0.58 percent) as compared with control participants. Physical activity advice alone was not associated with HbA1c changes," the authors write.

"This systematic review and meta-analysis of RCTs demonstrates important findings regarding the prescription of structured exercise training. First, aerobic, resistance, and combined training are each associated with HbA1c decreases, and the magnitude of this reduction is similar across the 3 exercise modalities. … Second, our findings demonstrate that structured exercise of more than 150 minutes per week is associated with greater declines in HbA1c than structured exercise of 150 minutes or less per week in patients with type 2 diabetes. This finding is important because the current guideline-recommended exercise duration is at least 150 minutes per week. Although high-intensity exercise has been previously shown to have an association with HbA1c reduction, our findings did not demonstrate that more intensive exercise was associated with greater declines in HbA1c."

The researchers add that the finding that physical activity advice is only associated with HbA1c reduction when accompanied by a dietary cointervention highlights the need for a combined recommendation of these lifestyle interventions.

More information: *JAMA*. 2011;305[17]1790-1799.

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