Effects of Aerobic Training, Resistance Training, or Both on Control of Blood Sugar in Type 2 Diabetes

What is the problem and what is known about it so far? Type 2 diabetes interferes with the body’s ability to store energy from food and results in high blood sugar levels. Over time, high blood sugar levels can lead to many complications, including blindness, kidney failure, nerve damage, and cardiovascular disease (heart disease and stroke). Hemoglobin A1c is a blood test that measures blood sugar control over the previous 3 months. Lower hemoglobin A1c values mean better sugar control. Good care with diet, exercise, and medications to control blood sugar levels clearly prevents or delays the development of diabetes-related complications. Regular exercise is an important part of diabetes care and can have a very a favorable effect on blood sugar levels. However, the benefits of different types of exercise (aerobic versus resistance [weightlifting] or a combination of both) are uncertain.

Why did the researchers do this particular study? To compare the effects of aerobic training, resistance training, or both types of exercise on blood sugar levels in people with type 2 diabetes.

Who was studied? 251 adults age 39 to 70 years who had type 2 diabetes. To be included, the patients needed to be free of unstable heart disease and prove during a trial period that they were motivated to participate in the exercise sessions.

How was the study done? The researchers assigned study patients to do 45 minutes of aerobic training, 45 minutes of resistance training, or 45 minutes each of both kinds of exercise 3 times weekly for 22 weeks. A control group of patients was assigned to a waiting list for an exercise program. The researchers examined hemoglobin A1c values after 6 months.

What did the researchers find? Compared with patients on the waiting list, patients in each of the exercise groups had better changes in hemoglobin A1c values. However, patients in the combined exercise group had better changes than those who did only 1 type of exercise.

What were the limitations of the study? The patients may be more motivated to exercise than the typical patient with type 2 diabetes. Patients in the combined exercise group exercised for longer periods than patients in the other exercise groups, and this study cannot tell us with certainty whether it was the combined exercise rather than the longer exercise session that resulted in better blood sugar control.

What are the implications of the study? Either aerobic exercise or resistance exercise alone improves blood sugar control in patients with type 2 diabetes, but a program of longer exercise sessions that include both types of exercise results in better blood sugar control after 6 months.