

Researchers test a drug-exercise program designed to prevent type 2 diabetes

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(Medical Xpress) -- Kinesiology researcher Barry Braun of the University of Massachusetts Amherst and colleagues recently reported unexpected results of a study suggesting that exercise and one of the most commonly prescribed drugs for diabetes, metformin, each improves insulin resistance when used alone, but when used together, metformin blunted the full effect of a 12-week exercise program in pre-diabetic men and women.

Insulin resistance is the root problem in pre-diabetes, a condition that often leads to [Type 2 diabetes](#), the increasingly common disease in which the natural hormone, insulin, becomes less effective at lowering blood sugar, leading to a range of [adverse health effects](#) such as eye and [nerve damage](#). An estimated 26 million Americans have diabetes and 69 million are pre-diabetic.

In studies funded by the [American Diabetes Association](#) and the National Institutes of Health, Braun expected to show that combining drug treatment and exercise would help to regulate blood sugar better than either treatment alone. However, the surprising result was that "exercise combined with [metformin](#) was not better than exercise alone and it might even be worse," says Braun. "We're now trying to understand the mechanisms to explain this." Findings appear in a recent issue of Diabetes Care.

Braun, with his former doctoral student Steven Malin, and colleagues recruited 32 men and women with pre-diabetes and assigned them to one

of four groups, 8 per group, and asked them to follow a 12-week course of exercise, exercise plus the drug metformin, metformin alone, or no treatment. The researchers measured insulin sensitivity at baseline and again after the 12-week treatment period in the double-blind study. Exercise training consisted of 60- to 75-minutes of aerobic exercise and resistance training three times per week.

All treatment groups had improved insulin sensitivity but only the two metformin groups lost weight after 12 weeks of exercise training, metformin alone or the two combined. But as noted, adding metformin to exercise did not enhance the effects of exercise training. Rather, adding metformin seems to have blunted the positive effect of exercise by 25 to 30 percent. This is probably enough to have clinical relevance, the researchers point out.

Braun and colleagues speculate that differences in outcome for the exercise-only and the exercise-plus-metformin group may be related to differences in how muscles, the liver and the insulin-producing cells of the pancreas adapt to exercise training when metformin is present. They are now turning their attention to investigate an exercise/medication combination that more effectively targets the liver and the pancreas in the hope of creating a more effective exercise drug to prevent the transition from pre-diabetes to Type 2 diabetes.

Provided by University of Massachusetts Amherst

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