

HIIT combining rowing and cycling improves insulin sensitivity in obesity and type 2 diabetes

24 September 2020



Credit: Unsplash/CC0 Public Domain

New research presented at this year's annual meeting of the European Association for the Study of Diabetes (EASD) shows that high-intensity interval training (HIIT) combining cycling and rowing markedly improves insulin sensitivity, body composition and cardiorespiratory fitness in cases of obesity and type 2 diabetes (T2D). The study is by Dr. Maria Petersen and colleagues at Steno Diabetes Centre Odense, Odense University Hospital, Odense, Denmark.

Physical activity is a cornerstone in the treatment and prevention of T2D, however typical aerobic endurance exercise training such as jogging has been found to provide only a modest (10-20%) improvement in [insulin](#) sensitivity. Recent studies suggest that HIIT consisting of short bursts of intense anaerobic exercise with less strenuous recovery periods in between may be a more effective strategy, and that the beneficial effects can be enhanced further through the involvement of more muscle groups.

Dr. Petersen and her team recruited a total of 48

men for the study. They included 15 men with type 2 diabetes who were also obese (average BMI 31kg/m²), together with two age-matched groups of healthy glucose-tolerant men for comparison. The non-diabetic participants consisted of 15 with obesity (average BMI 31kg/m²) and 18 who were lean (average BMI 24kg/m²).

Participants undertook an 8-week supervised HIIT programme of 3 [training sessions](#) per week, which combined periods of cycling and rowing. The effects of the training on participants' bodies was evaluated through a combination of Dual-energy X-ray absorptiometry (DXA) scans to determine body composition, VO₂ max tests to measure oxygen utilisation, and euglycemic-hyperinsulinemic clamps combined with indirect calorimetry to evaluate insulin sensitivity and metabolism, respectively. HIIT-sessions consisted of blocks of 5 x 1 min bursts of exercise interspersed with 1 min rest, shifting between blocks on cycle and rowing ergometers, and with an increasing volume from two to five blocks during the 8 weeks.

At the beginning of the study, men with T2D had 35-37% lower insulin sensitivity and around a 13% lower insulin-mediated suppression of lipid oxidation (lower suppression is an additional indicator of poor insulin sensitivity) compared with the non-diabetic subjects. After undergoing 8 weeks of HIIT, all participants showed big improvements in insulin sensitivity. Average increases of 32-37% were observed in lean men and men with obesity, while the increase among the diabetic group averaged 44%.

Blood sugar levels also improved in those participants with T2D, resulting in both lowered fasting plasma glucose and a fall in glycated haemoglobin (a measure of blood sugar control) (HbA1c).

The authors also found that body fat mass reduced by 1.6-2.3kg in all 3 groups, while fat-free mass (used as a proxy for muscle mass) increased by 0.9-1.5kg in men with obesity, both with and without T2D. In addition, it was observed that VO₂max increased by 10% in lean and obese healthy men, and 15% in the T2D group.

The authors conclude: "A HIIT-protocol recruiting both lower and upper body muscles efficiently improves [insulin sensitivity](#), VO₂max and [body composition](#) to the same extent in obesity and type 2 diabetes as in lean healthy individuals." They add: "In patients with type 2 diabetes, the HIIT-protocol also improved glycaemic control."

Provided by Diabetologia

APA citation: HIIT combining rowing and cycling improves insulin sensitivity in obesity and type 2 diabetes (2020, September 24) retrieved 23 November 2020 from <https://medicalxpress.com/news/2020-09-hiit-combining-rowing-insulin-sensitivity.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.