Endurance training per se increases metabolic health in young, moderately overweight men. - DTU Orbit (01/07/2019)

**Endurance training per se increases metabolic health in young, moderately overweight men.**

Health benefits of physical activity may depend on a concomitant weight loss. In a randomized, controlled trial we compared the effects of endurance training with or without weight loss to the effect of weight loss induced by an energy-reduced diet in 48 sedentary, moderately overweight men who completed a 12-week intervention program of training (T), energy-reduced diet (D), training and increased diet (T-ID), or control (C). An energy deficit of 600 kcal/day was induced by endurance training or diet in T and D and a similar training regimen plus an increased dietary intake of 600 kcal/day defined the T-ID group. Primary endpoint was insulin sensitivity as evaluated by HOMA-IR (mainly reflecting hepatic insulin sensitivity) and hyperinsulinemic, isoglycemic clamps (primarily reflecting peripheral insulin sensitivity). Body mass decreased in T and D by 5.9±0.7 and 5.3±0.7 kg, respectively, whereas T-ID and C remained weight stable. Total and abdominal fat mass were reduced in an additive manner in the T-ID, D and T groups by 1.9±0.3/0.2±0.1, 4.4±0.7/0.5±0.1 and 7.7±0.8/0.9±0.1 kg, respectively. HOMA-IR was improved in T, D and T-ID, whereas insulin-stimulated glucose clearance and suppression of plasma non-esterified fatty acids were increased only in the two training groups. Thus, loss of fat mass (diet or training-induced) improves hepatic insulin sensitivity, whereas peripheral insulin sensitivity in skeletal muscle and adipose tissue is increased by endurance training only. This demonstrates that endurance training per se increases various metabolic health parameters and that endurance training should preferably always be included in any intervention regimen for improving metabolic health in moderately overweight men.

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