JOURNAL WATCH

Highlights from the most important research articles across the spectrum of topics relevant to the field of diabetes management

Mavros Y, Kay S, Anderberg KA *et al*. Changes in insulin resistance and HbA1c are related to exercise-mediated changes in body composition in older adults with Type 2 diabetes: interim outcomes from the GREAT2DO trial. *Diabetes Care* doi:10.2337/dc12–2196 (2013) (Epub ahead of print).

In this randomized study, 103 older individuals with Type 2 diabetes received either progressive resistance training (PRT) or sham exercise 3 days per week for 12 months to assess body composition changes in relation to changes in insulin resistance (IR) or glucose homeostasis. By testing the homeostatic model of assessment 2 (HOMA2-IR), it was observed that changes in HOMA2-IR were associated with changes in skeletal muscle mass (SkMM; r = -0.38; p = 0.04) and fat mass (r = 0.42; p = 0.02) in the PRT group. Furthermore, it was also observed in the PRT group that changes in HbA1c were related to changes in mid-thigh muscle attenuation (r = 0.52; p = 0.001). However, the sham group did not have any indication of these relationships (p > 0.05). Individuals from the PRT group who had an increased SkMM, had a decreased HOMA2-IR and HbA1c (p = 0.07 and p < 0.05, respectively) when compared with individuals from the sham group who had an increased SkMM. Furthermore, individuals who had an increased SkMM in the PRT group had a decreased HOMA2-IR and HbA1c (p = 0.05 and p = 0.09, respectively) when compared with those in the PRT group who lost SkMM. Overall, the authors concluded that older individuals with Type 2 diabetes can improve their metabolic health by carrying out PRT.

Sparks LM, Johannsen NM, Church TS *et al*. Nine months of combined training improves *ex vivo* skeletal muscle metabolism in individuals with Type 2 diabetes. *J. Clin. Endocrinol. Metab.* 98(4), 1694–1702 (2013).

As an ancillary to the HART-D trial, the authors aimed to test mitochondrial content and substrate oxidation in individuals with Type 2 diabetes when subjected to different types of exercise (aerobic training: n = 12; resistance training: n = 18; combination training: n = 12; or no exercise controls: n = 10). It was observed that following resistance and combination training, mitochondrial content increased, and after aerobic training and combination training, octanoate oxidation increased. In all exercise groups, palmitate, pyruvate and acetate oxidations increased. At 9 months follow-up, it was noted that aerobic training and resistance training improved most aspects of substrate oxidation and skeletal muscle mitochondrial content and combination training improved all aspects. Overall, the clinical improvement after exercise indicates that long-term training could be an effective therapy for individuals with Type 2 diabetes.

Future Medicine part of fsg

Leenders M, Verdijk LB, van der Hoeven L *et al.* Patients with Type 2 diabetes show a greater decline in muscle mass, muscle strength, and functional capacity with aging. *J. Am. Med. Dir. Assoc.* doi: 10.1016/j.jamda.2013.02.006 (2013) (Epub ahead of print).

The aim of this study was to assess whether Type 2 diabetes has an impact on strength, muscle mass and functional capacity in elderly individuals. To do this, the study compared 32 normoglycemic individuals with 60 Type 2 diabetic men (70 ± 1 and 71 ± 1 years, respectively) using a variety of tests, including dual-energy x-ray absorptiometry and muscle biopsies, to assess muscle mass and handgrip strength for functional capacity. It was observed that the normoglycemic controls had better leg lean mass than their age-matched diabetic counterparts (19.7 ± 0.3 vs 19.1 ± 0.3 kg, respectively), as well as better appendicular skeletal muscle (26.7 ± 0.5 vs 25.9 ± 0.4 kg). In addition, leg extension strength was higher in the normoglycemic controls compared with diabetics (91 ± 2 vs 84 ± 2 kg, respectively), as was handgrip strength (44.6 ± 6.1 vs 39.5 ± 5.8 kg). It was observed, however, that there was no difference in muscle fiber size and reaction time performance between the two groups. The results suggest that there could be a link between Type 2 diabetes in the elderly and leg lean mass, muscle strength and functional capacity and, consequently, exercise intervention programs should be tailored to target these areas in this population.

– Paper suggestions by Dominque Hansen (Hasselt University, Faculty of Medicine, Belgium). All stories written by Natasha Leeson

Journal Watch highlights some of the most important papers recently published in the field of diabetes management and research. The editorial team welcomes recommendations for relevant papers for inclusion in future issues.
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