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The effect of power training on habitual physical activity in older adults with type 2 diabetes: Secondary outcomes of the GREAT2DO randomized controlled trial

Mosalman Haghighi, M., Mavros, Y., Fiatarone Singh, M.A.

The University of Sydney

INTRODUCTION:
Physical activity (PA) has been endorsed as a key component in the management of type 2 diabetes (T2D), and is effective in improving glycaemic control [1]. However, individuals with T2D are less likely to engage in recommended levels of PA compared to healthy peers [2]. There is some evidence that structured aerobic exercise may simply substitute for habitual PA participation, precluding increases in overall PA. We hypothesised that power training, by contrast, would be associated with a maintenance or increase in habitual PA level, as shown in previous trials of progressive resistance training (PRT). We also hypothesized that increases in habitual as well as habitual total PA (structured + habitual) would be associated with improvements in metabolic profile and body composition.
METHODS:
One-hundred and three older adults with T2D were randomized to receive 12 months of power training (high intensity, high velocity, PRT) or sham-exercise (low intensity, non-progressive exercise). Habitual PA was assessed using the Physical Activity Scale for the Elderly (PASE). Insulin resistance (HOMA2-IR) and glycosylated haemoglobin (HbA1c) were used as indices of metabolic control. Skeletal muscle and total fat mass were estimated using bioelectrical impedance and abdominal and thigh composition were quantified via computed tomography. Depression symptoms were assessed by Geriatric Depression Scale (GDS).
RESULTS:
At baseline, PASE scores were 107.7 ± 61.4 in the PRT group and 125.1 ± 63.0 in the sham group (p= 0.30). Habitual PA increased in the PRT group at 6 and 12 months (115.1 ± 54.3 and 116.0 ± 69.2) and decreased in sham group at 6 months (109.8 ± 55.9) but returned to baseline at 12 months (126.4 ± 70.0), with no significant group x time interaction across the 12 months. Changes in total PA were not associated with changes in HbA1c (p= 0.92), HOMA2-IR (p= 0.59), waist circumference (p=0.09), total abdominal fat (p= 0.87), visceral fat (p=0.68), intermuscular thigh fat (p=0.68), fat mass (p=0.37), total muscle mass (p= 0.72), thigh muscle cross-sectional area (p= 0.92) or depressive symptoms (p=0.26) in the overall cohort.
CONCLUSION:
As hypothesized, older adults with T2D undertaking power training maintain or increase their habitual levels of PA. Thus, overall PA level is enhanced with the addition of power training. Clinical benefits may require larger improvements in overall PA levels than observed in this cohort however.
References:
1. Umpierre, D, et al., Physical activity advice only or structured exercise training and association with HbA1c levels in type 2 diabetes: a systematic review and meta-analysis. Jama, 2011. 305(17): p.1790-1799.
2. McLaughlin, S.J, CM. Connell, and MR. Janevic, Gender Differences in Trajectories of Physical Activity Among Older Americans With Diabetes. J Aging Health, 2016. 28(3): p.460-80.

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