Publication News 23 - 20 June 2022

Longer physical activity is associated with better nerve fiber function in longstanding type 1 diabetes: a cross-sectional analysis of the Canadian study of longevity

Aim: To determine the association between physical activity (PA), distal symmetric polyneuropathy (DSPN) and cardiac autonomic neuropathy (CAN) as an exploratory analysis in the Canadian Study of Longevity in Type 1 Diabetes (T1D).
Methods: Data from 75 participants ≥50 years of diabetes duration were collected as part of the Canadian Study of Longevity in T1D. Participants completed a physical exam, medical history, late complications and reported their daily PA from the preceding 12-months. DSPN and CAN were examined.
Results: Participants were 66±8 years old with diabetes duration of 54 [52,58] years, HbA1c was 7.3±0.8%. 65 patients (89%) had DSPN. Weekly PA time was 156±132 min, and 35 (47%) patients reported ≥150 min/week of PA and 28 (37%) reported ≥210 min/week. Participants with DSPN reported lower PA time compared to individuals without DSPN (141±124 min/week vs. 258±129 min/week; p=0.015). Participants who reported PA time of >150 min/week had 12% lower incidence of DSPN compared to those who reported <150 min/week. Moreover, PA time was progressively lower with increasing DSPN status (p for trend=0.015). PA time was associated with better cooling detection threshold (r=0.24; p=0.043), peroneal and sural amplitude (r=0.36; p=0.0017, r_s=0.26; p=0.024) and conduction velocity (r_s=0.28; p=0.015, r=0.23; p=0.050). Linear regression adjusting for age and HbA1c, showed that for each 30-min of PA there was a 0.09 mv higher peroneal amplitude (p=0.032) and 0.048 ms lower peroneal F-wave latency (p=0.022). There was no correlation between PA time and CAN parameters.
Conclusion: In longstanding T1D, PA time is associated with superior large nerve fibre function in the lower limbs and some better measures of small nerve fibre function.

Comments. There has been limited investigation into the effects of physical activity on DSPN and CAN in longstanding T1D. For individuals with diabetes, current clinical practice guidelines recommended at least 150 min/week of physical activity. In this study those who fulfill these guidelines (47%) have 12% lower incidence of peripheral neuropathy. The study provides novel findings on the potential role of lifestyle in the prevention and management of diabetes complications. It is encouraging that almost half of the cohort reported PA levels that meet or exceed current clinical practice guideline recommendations. The study results might confirm the benefits of PA on neuroprotection and reinnervation through increasing nerve blood flow, releasing of nitric oxide and neurotrophic factors. PA was associated with better large nerve fibre function measured by VPT and small fibre function with better cooling detection. However, due to cross-sectional study design, only the association rather than a causality assessment was proved. The intervention studies are needed.

Aleksandra Araszkiewicz

Reference. Lewis EJH, Lovblom LE, Lanctot S, Scarr D, Cardinez N, Boulet G, Weisman A, Lovshin JA, Lytvyn Y, Keenan HA, Brent MH, Paul N, Cherney DZI, Bril V, Perkins BA. The association between physical activity time and neuropathy in longstanding type 1 diabetes: A cross-sectional analysis of the Canadian study of longevity in type 1 diabetes. J Diabetes Complications. 2022 Mar;36(3):108134. doi: 10.1016/j.jdiacomp.2022.108134. Epub 2022 Jan 31.
https://www.sciencedirect.com/science/article/abs/pii/S1056872722000101?via%3Dihub