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No clear evidence of neuropathy among patients with high risk for prediabetes/diabetes

Aims: Given that autonomic and sensory neuropathy have been found in prediabetes, the study wants to investigate if people with moderate or high risk of developing diabetes, yet without a diagnosis of prediabetes or diabetes, exhibit an increased prevalence of neuropathy.
Methods: Finnish Diabetes Risk Score (FINDRISC) was used to classify group at risk (≥12 points, n=44) and control group (<12 points, n=28). HbA1c levels >5.6% and fasting blood glucose ≥5.9 mmol/l were exclusion criteria, as well as known medical conditions predisposing to neuropathy. Cardiac autonomic function (CAN) (4 cardiovascular reflex tests) and peripheral sensory neuropathy (DSPN) (current and thermal perception thresholds, tuning fork, and monofilament) were assessed by standardized protocols. Association between CAN and DSPN with FINDRISC was analysed using a regression model.
Results: Mean age was 46.7±14.3 in the control and 55.7±14.1 years in the high-risk group. Male/female ratio did not differ. Individuals with increased risk of diabetes showed higher BMI (29.9±12.5 kg/m2 vs. 25.9±8.9 kg/m2), more hypertension (68.2% vs. 17.9%), and less favourable lipid parameters. Parasympathetic neuropathy was present in both groups (56.8% vs. 32.1%, respectively). Sympathetic neuropathy was not found. Sensory nerve dysfunction was of low prevalence in the high-risk group and absent in healthy controls. In multiple logistic regression analysis, HbA1c was independently associated with parasympathetic neuropathy (OR: 5.9; 95% CI: 1.08-32.68; p<0.041).
Conclusions: An increased risk of developing prediabetes/diabetes is not strongly related to an increased likelihood of developing autonomic or sensory neuropathy. However, the factors behind the development of parasympathetic dysfunction in healthy individuals remains unknown.

Comments. All aspects of this interesting study are not easily tangible from the abstract and I will encourage Neurodiab colleagues to read the full paper. The two groups compared were 44 participants with an increased risk of diabetes (FINDRISC ≥12 points, referred as high-risk group), along with 28 control patients (FINDRISC <12 points, referred as control group). CAN was more frequent in patients with an increased risk of developing type 2 diabetes when compared to healthy control subjects, and it shows independent association with HbA1c levels within the normal range. Diabetic polyneuropathy was evaluated by Neurometer, 128-Hz tuning fork, and monofilament.
Limitations of this study: apart from the obvious small number of participants in both cohorts making it difficult to adjust for confounders, this is a cross-sectional study as compared to a longitudinal design which is more powerful to examine causation. The use of beta-blockers and diuretics in some patients could also influence CAN outcomes.
So, the queries that may arise amongst Neurodiab colleagues include: (i) Have you noted a similar inverse association between HbA1c (<5.6%) and small and large fibre neural outcomes in your healthy controls? and (ii) Is there any similar association in your longitudinal outcomes?

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Reference. Körei AE, Békeffy M, Menyhárt A, Osgyán K, Istenes I, Horváth VJ, Kempler P. No clear evidence of neuropathy among patients with high risk for the development of prediabetes/diabetes-a pilot study. Front Endocrinol (Lausanne). 2024 Jan 30;15:1302013. doi: 10.3389/fendo.2024.1302013. PMID: 38352713; PMCID: PMC10863448.
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