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Insulin resistance predicts the risk of diabetic peripheral neuropathy

Aims: To explore the association between insulin resistance measured with estimated glucose disposal rate (eGDR) formula and diabetic peripheral neuropathy (DPN) longitudinally in patients with type 2 diabetes (T2DM).
Methods: In a prospective study, 366 subjects with T2DM and without DPN were enrolled from six communities in Shanghai in 2011–2014 and followed up until 2019-2020. Neuropathy was assessed by Michigan Neuropathy Screening Instrument (MSNI) at baseline and at the end of follow-up.
Results: After 5.91 years, 198 of 366 participants progressed to DPN according to MNSI examination score. The incidence of DPN in the low baseline eGDR (eGDR <9.15) group was higher than in the high baseline eGDR (eGDR ≥9.15) group (62.37% vs. 45.56%, p=0.0013). The incidence of DPN was significantly higher in patients with sustained, - at entry and follow-up - lower eGDR level (63.69%), compared with those with sustained higher eGDR level (35.80%). Subjects with low baseline eGDR had significantly higher risk of DPN at the end of follow-up (odds ratio=1.75), even after adjusting for known DPN risk factors.
Conclusions*:* The 5-year follow-up study highlights the importance of insulin resistance represented by eGDR in the development of DPN in T2DM. Diabetic patients with low eGDR are more prone to DPN and, therefore, require more intensive screening and more attention.

Comments. This a convincing and interesting evidence of the relationship between insulin resistance and the development of diabetic neuropathy. The strong point is a prospective observation of subjects at baseline without DPN. After 5 years as many as 54% of patients progressed to DPN. Interestingly, the authors used simple formula of eGDR to estimate insulin resistance. It contains the waist-to-hip ratio, hypertension diagnosis and A1c value. The eGDR has been used most frequently in studies of T1DM. Recently, eGDR has also been proposed as a simple and reliable method to assess insulin resistance in T2DM patients. Moreover, the authors pointed that the incidence of DPN was significantly higher in patients with sustained low eGDR level compared with those with sustained high eGDR level at baseline and follow-up. To sum up, eGDR could help to predict the risk of DPN and provide reliable information for clinical decision making.

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Reference. Zhang Y, Sun W, Zhang Q, Bai Y, Ji L, Zheng H, Zhu X, Liu X, Zhang S, Xiong Q, Li Y, Chen L, Lu B. Estimated glucose disposal rate predicts the risk of diabetic peripheral neuropathy in type 2 diabetes: A 5-year follow-up study. J Diabetes. 2024 Jan 15. doi: 10.1111/1753-0407.13482. Epub ahead of print. PMID: 38225901.
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