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Neuropathy scale score as an independent risk factor for myocardial infarction in type 2 diabetes

Aim: The aim of the study was to evaluate the relationship between neuropathy scale scores and myocardial infarction (MI) in patients with type 2 diabetes mellitus (T2D) in a large cross-sectional study in China.
Methods: This study was based on a cross-sectional survey of 32463 subjects with T2D enrolled in 103 tertiary hospitals in China from July 2017 to December 2018. Neuropathies other than diabetic neuropathy and diseases other than atherosclerosis that cause heart failure, such as valvular heart disease, cardiomyopathy, or vasculitis, were enlisted amongst the exclusion criteria. Four neuropathy scales, i.e., Neurological Symptom Score (NSS), Neurological Disability Score (NDS), Toronto Clinical Scoring System (TCSS), and Michigan Neuropathy Screening Instrument (MNSI) were used, and also nerve conduction velocity (NCV) test was performed in 20288 (62.5%) participants.
Results: A history of MI was found in 4170 (12.8%) compared to 28293 (87.2%) without. Subjects with MI were older, with a longer diabetes duration and a higher prevalence of hypertension, however, they also showed better glucose control and lipids profiles. Further, neuropathy scales scores were higher in subjects with MI compared to non-MI patients. The incidence rate of MI increased along with increasing scores of each scale, as well as with increasing number of nerves with abnormal NCV. When evaluating the odds ratio and ROC curves for the four scales, MNSI presented the highest odds ratio and AUC for MI (adjusted odds ratio 2.06 and AUC 0.625).
Conclusions: In subjects with T2D increased scores on the most used peripheral neuropathy scales such as NSS, NDS, TCSS and MNSI and also abnormal NCV were significantly associated with increased risk of MI.

Comments. This was the first large population-based study conducted in Asia evaluating the association between MI and diabetic peripheral neuropathy (DPN) assessed with validated neuropathy scales (NSS, NDS, MNSI, and TCSS). Interestingly, the incidence of MI significantly increased with an increase in neuropathy scale scores, suggesting a relationship between the severity of neuropathy and the prevalence of MI. Further, this study suggests that DPN was significantly associated with MI. This evidence is in line with other findings that suggest that the cumulative burden of microvascular complications significantly affects the risk of future cardiovascular events among subjects with T2D (Brownrigg JR et al *Lancet Diabetes Endocrinol. 2016;4:588-97*). Once more, these findings highlight the relevance of assessing DPN in subjects with T2D and the correct management of diabetes to prevent the development of its chronic complications. Further, the study revealed that nerve damage could be used to assess the severity of MI, and that it is important to be alert to MI if patients have abnormal NCV in two or more nerves. However, it has to be acknowledged that this is a cross-sectional study and prospective studies are needed to evaluate how DPN impacts MI risk over time and also to confirm the results in different populations.

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Reference. Wang L, Guo S, Wang W, Xu B, Chen W, Jing Y, Jin J, Li C, Zhou Y, Zhu D. Neuropathy scale score as an independent risk factor for myocardial infarction in patients with type 2 diabetes. Diabetes Metab Res Rev. 2022 Jul 1:e3561. doi: 10.1002/dmrr.3561.
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