RESPONSE TO COMMENT ON MIZOKAMI-STOUT ET AL.

The Contemporary Prevalence of Diabetic Neuropathy in Type 1 Diabetes: Findings From the T1D Exchange. Diabetes Care 2020;43:806–812

Kara R. Mizokami-Stout,[1] Zoey Li,[2] Nicole Foster,[2] Lynn Ang,[1] and Rodica Pop-Busui,[1] for T1D Exchange Clinic Network

Diabetes Care 2020;43:e114–e115 | https://doi.org/10.2337/dci20-0028

We thank Professor Kostev for his comments (1) on our manuscript that evaluated the contemporary prevalence of diabetic peripheral neuropathy (DPN) in 5,936 participants with type 1 diabetes (T1D) in the T1D Exchange Clinic Registry (2). As described, we found a DPN prevalence of 11% as defined by the Michigan Neuropathy Screening Instrument Questionnaire (MNSIQ) (2). Our study highlighted several nonglycemic risks factors including hypertriglyceridemia (odds ratio [OR] 1.03, 95% CI 1.01, 1.05) and smoking (OR 1.83, 95% CI 1.18, 2.82) and other complications including retinopathy (OR 1.46, 95% CI 1.14, 1.88) and cardiovascular disease (CVD) (OR 1.73, 95% CI 1.24, 2.42) (2).

We elected to use the MNSIQ because it is a simple, noninvasive measure of DPN that has been previously validated in several other T1D cohorts, including the Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) (3), and could be reliably administered to larger cohorts. Importantly, the same MNSIQ was used to evaluate the prevalence of DPN in another large cohort of patients with T1D participating in the Scottish Diabetes Research Network Type 1 Bioresource (SDRNT1BIO); a report of this study published in the same issue reported remarkably similar DPN prevalence (12.9%) (4). Jeyam et al. similarly found that hypertriglyceridemia (OR 1.17, 95% CI 1.04, 1.31), smoking (OR 1.67, 95% CI 1.37, 2.03), albuminuria (OR 1.92, 95% CI 1.41, 2.63) and an estimated glomerular filtration rate <30 mL/min/1.73 m^2 (OR 1.96, 95% CI 1.03, 3.74) were important DPN risk factors (4).

We are happy to see that comparable DPN prevalence and vascular risk factors were found by the study reported by Kostev in 9,349 individuals with T1D in the German Disease Analyzer database (1) while using ICD-10 codes for the diagnosis of DPN. Although there are limitations to quantifying DPN prevalence based on ICD codes, prior studies based on ICD-10 codes have found a positive predictive value of 72% for assessment of DPN prevalence (5). In our own study (2), we found a similar degree of concordance between the MNSIQ-defined DPN and clinic-reported DPN.

Importantly, our study found that markers of lower socioeconomic status, including lower education levels (OR 1.15, 95% CI 1.08, 1.23) and lack of private insurance (OR 1.89, 95% CI 1.46, 2.44, for other insurance vs. private insurance), are additional risk factors (2), as was also observed by Jeyam et al. (4) in the Scottish cohort. Large-scale databases have potential to evaluate the impact of social determinants of health but are limited by the potential for misclassification of diabetes and lack of traditional methods for DPN evaluation. However, the misclassification error rate may be lower than previously thought, and we should utilize available databases for further assessment of social determinants of health on diabetes outcomes.

These independent findings from three large T1D cohorts further highlight that DPN prevalence in patients with T1D remains unacceptably high and that cardiovascular risk factors and markers of socioeconomic status likely play key roles in its development.

We thank Professor Kostev for acknowledging our work. We are pleased that despite different methodologies used, our findings for DPN prevalence are similar.

Funding. The T1D Exchange is supported by the Leona M. and Harry B. Helmsley Charitable Trust. R.P.-B. was also supported by R01-DK-107956-01 and U01-DK-119083 from the National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health.

Duality of Interest. No potential conflicts of interest relevant to this article were reported.

References

1. Kostev K. Comment on Mizokami-Stout et al. The contemporary prevalence of diabetic neuropathy in type 1 diabetes: findings from the T1D Exchange. Diabetes Care 2020;43:806–812 (Letter). Diabetes Care 2020;43:e113. DOI: 10.2337/dc20-0878
2. Mizokami-Stout KR, Li Z, Foster NC, et al.; T1D Exchange Clinic Network. The contemporary prevalence of diabetic neuropathy in type 1 diabetes: findings from the T1D Exchange. Diabetes Care 2020;43:806–812
3. Martin CL, Albers JW, Pop-Busui R; DCCT/EDIC Research Group. Neuropathy and related findings in the diabetes control and complications trial/epidemiology of diabetes interventions and complications study. Diabetes Care 2014;37:31–38

[1]*Division of Metabolism, Endocrinology and Diabetes, Department of Internal Medicine, University of Michigan, Ann Arbor, MI*
[2]*Jaeb Center for Health Research, Tampa, FL*

Corresponding author: Kara R. Mizokami-Stout, kmizokam@med.umich.edu

4. Jeyam A, McGurnaghan SJ, Blackbourn LAK, et al.; SDRNT1BIO Investigators. Diabetic neuropathy is a substantial burden in people with type 1 diabetes and is strongly associated with socioeconomic disadvantage: a population-representative study from Scotland. Diabetes Care 2020;43:734–742
5. Christensen DH, Knudsen ST, Nicolaisen SK, et al. Can diabetic polyneuropathy and foot ulcers in patients with type 2 diabetes be accurately identified based on ICD-10 hospital diagnoses and drug prescriptions? Clin Epidemiol 2019;11:311–321