Response

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The Necessity of the Simple Tests for Diabetic Peripheral Neuropathy in Type 2 Diabetes Mellitus Patients without Neuropathic Symptoms in Clinical Practice (*Diabetes Metab J* 2018;42:442-6)

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We appreciate Dr. Hong for expressing interest and giving valuable comments on our article entitled "The necessity of the simple tests for diabetic peripheral neuropathy in type 2 diabetes mellitus patients without neuropathic symptoms in clinical practice" which was published in *Diabetes & Metabolism Journal* [1].

Diabetic peripheral polyneuropathy (DPNP) is a major risk factor for foot ulcers and amputation in diabetic patients. To confirm the diagnosis of DPNP, a nerve-conduction study or skin biopsy is required. However, these procedures are invasive and may be unsuitable for use in clinical practice [2]. Because the majority of health care visits for diabetic patients take place in primary care level, a simple method that is easily applicable and clinically reliable in clinical practice for the prevention of DPNP and/or early diagnosis is needed. A number of methods including the 10-g Semmes-Weinstein monofilament examination (SWME), the 128-Hz tuning-fork, ankle reflex, pinprick tests, the Total Symptom Score (TSS), and the 15-item self-administered questionnaire of the Michigan Neuropathy Screening Instrument (MNSI questionnaire) have so far been developed and used [3].

In our study, the abnormal response rates of the SWME, the 128-Hz tuning-fork, ankle reflex, pinprick tests, the TSS, and the MNSI questionnaire varied depending on the methods used according to the presence of subjective neuropathic symptoms (18.8% vs. 5.7%, $P<0.05$; 58.3% vs. 28.4%, $P<0.005$; 81.3% vs. 54.5%, $P<0.005$; 12.5% vs. 5.7%, $P=0.195$; 41.7% vs. 2.3%, $P<0.001$; and 77.1% vs. 9.1%, $P<0.001$; respectively). The largest abnormal response was derived by combining all methods. We found that combining at least the 128-Hz tuning-fork and ankle reflex tests would be needed for the detection of DPNP. However, because the patients enrolled in our study were not confirmed for the diagnosis of DPNP by gold standard tests, we could not recommend this combination for the detection of DPNP in clinical practice. The relatively lower abnormal response rates of the SWME and the relatively higher abnormal response rates of 128-Hz tuning-fork compared to previous studies are probably due to this limitation of our study [4,5]. Instruments such as the SWME, ankle reflex, and 128-Hz tuning-fork tests have been recommended as screening tools for DPNP [6]. They can be used alone or combined to assess and contribute to the clinical diagnosis of DPNP. Our findings indicate that examination with as many tests and questionnaires as possible is important for early detection of DPNP in diabetic patients with and without neuropathic symptoms, but, it is not easy in clinical practice. Therefore, the authors fully agree with Dr. Hong's opinion that further studies are needed to find an efficient combination among the easily

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applicable and clinically reliable screening and diagnostic methods.

We totally agree with Dr. Hong's suggestion of differentiating the clinical parameters of patients with symptomatic/asymptomatic DPNP from those of patients without DPNP. Any patient with diabetes may develop DPNP regardless of the duration of diabetes. The prevalence of DPNP in patients with prediabetes and with new onset diabetes was about 50% [7]. Symptoms of DPNP vary according to the class of sensory fibers involved. Large nerve fibers are damaged later than small nerve fibers [8]. Pinprick test may be used to assess small nerve fiber function and SWME, while 128-Hz tuning-fork and ankle reflex tests may be used to assess large nerve fiber [6]. In patients with DPNP, up to 50% of patients may experience symptoms of DPNP, whereas the rest are asymptomatic [6]. Diabetic patients with long duration are frequently asymptomatic with elevated pain threshold [9]. Therefore, it is necessary to identify the clinical risk factors according to the presence of DPNP or neuropathic symptoms and to find individualized diagnostic strategies based on clinical risk factors.

Thank you again for your interest in our study and thoughtful comments.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Park JH, Kim DS. The necessity of the simple tests for diabetic peripheral neuropathy in type 2 diabetes mellitus patients without neuropathic symptoms in clinical practice. Diabetes Metab J 2018;42:442-6.
2. Deli G1, Bosnyak E, Pusch G, Komoly S, Feher G. Diabetic neuropathies: diagnosis and management. Neuroendocrinology 2013;98:267-80.
3. Ko SH, Cha BY. Diabetic peripheral neuropathy in type 2 diabetes mellitus in Korea. Diabetes Metab J 2012;36:6-12.
4. Wang F, Zhang J, Yu J, Liu S, Zhang R, Ma X, Yang Y, Wang P. Diagnostic accuracy of monofilament tests for detecting diabetic peripheral neuropathy: a systematic review and meta-analysis. J Diabetes Res 2017;2017:8787261.
5. Hirschfeld G, von Glischinski M, Blankenburg M, Zernikow B. Screening for peripheral neuropathies in children with diabetes: a systematic review. Pediatrics 2014;133:e1324-30.
6. Pop-Busui R, Boulton AJ, Feldman EL, Bril V, Freeman R, Malik RA, Sosenko JM, Ziegler D. Diabetic neuropathy: a position statement by the American Diabetes Association. Diabetes Care 2017;40:136-54.
7. Lee CC, Perkins BA, Kayaniyil S, Harris SB, Retnakaran R, Gerstein HC, Zinman B, Hanley AJ. Peripheral neuropathy and nerve dysfunction in individuals at high risk for type 2 diabetes: the PROMISE cohort. Diabetes Care 2015;38:793-800.
8. Hartemann A, Attal N, Bouhassira D, Dumont I, Gin H, Jeanne S, Said G, Richard JL; Working Group on the Diabetic Foot from the French-speaking Society of Diabetology. Painful diabetic neuropathy: diagnosis and management. Diabetes Metab 2011;37:377-88.
9. Suzuki C, Kon T, Funamizu Y, Ueno T, Haga R, Nishijima H, Arai A, Tomiyama M, Baba M. Elevated pain threshold in patients with asymptomatic diabetic neuropathy: an intraepidermal electrical stimulation study. Muscle Nerve 2016;54:146-9.