

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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Diabetic neuropathy is a serious complication of diabetic patients. Serial progression of diabetic neuropathy leads from initiation of foot ulcer, subsequent amputation of extremities to severe disability, poor quality of life, and economic burden. The prevalence of diabetic neuropathy with type 2 diabetes mellitus is associated with glycemic control state and duration from the diagnosis of diabetes [1]. However, even in prediabetes, the prevalence of diabetic neuropathy is higher than normal glucose control state. Although different for each investigator, Lee et al. [2] reported that the prevalence of neuropathy with prediabetes (49%) was similar with new-onset diabetes (50%) in a longitudinal cohort of Prospective Metabolism and Islet Cell Evaluation (PROMISE). Especially in diabetic patients with long duration, early detection of diabetic neuropathy difficult because they are frequently asymptomatic with elevated pain threshold [3]. One of the recommended standard treatments for diabetic neuropathy is pregabalin. The treatment with pregabalin for diabetic neuropathy was more effective in patients with short duration of diabetes [4]. Thus, early detection and early treatment of diabetic neuropathy is important to prevent further complication and deterioration of life quality.

In this article entitled “The necessity of the simple tests for diabetic peripheral neuropathy in type 2 diabetes mellitus pa-

tients without neuropathic symptoms in clinical practice,” Park et al. [5] investigated the detection ability of practical modalities to discriminate patients with diabetic neuropathy from type 2 diabetes mellitus patients with or without neuropathic symptoms. The combination of six modalities (pinprick test, tuning fork test, Semmes-Weinstein monofilament examination [SWME], ankle reflex, and two questionnaires of Michigan Neuropathy Screening Instrument [MNSI] and total symptom score) for detecting patients with diabetic neuropathy showed higher sensitivity (97.9% for patients with symptoms, 70.5% for patients without symptoms). However, it is limited by that there is no single gold standard test for detecting diabetic neuropathy. The 10-g SWME is known as a representative diagnostic tool for detecting diabetic neuropathy patients. However, the sensitivity of the monofilament test is very variable from 15% to 95%. According to the meta-analysis of the diagnostic accuracy of monofilament test, the sensitivity and specificity were 53% and 88%, respectively [6]. In children below 18 years old with type 1 diabetes mellitus, the accuracy of monofilament test was also variable from 19% to 73%. The sensitivity of tuning fork test was discouraging, 1% to 19% [7]. In this article by Park et al. [5], the abnormal results of SWME were relative low (18.8% with patients with symptoms, 5.7% with patients with symptoms). With the variable results of diagnostic tests, performing

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as many tests as possible is required to detect patients with diabetic neuropathy. However, it is not easy to apply all methods to diabetic patients in clinical situation.

Identification of patients in high risk of diabetic neuropathy among all visiting diabetic patients is required. Clinical factors such as duration of diabetes, glycosylated hemoglobin, obesity, combined dyslipidemia, and even tall stature are associated with the progression of diabetic neuropathy [8]. Considering the risk factors, early application of diagnostic tests for diabetic neuropathy is recommended. Patients with short duration since the diagnosis of diabetes were relatively good responders to the treatment of neuropathy. The accuracy of diagnostic tests may be different for patients with short and relatively long duration since diagnosis of diabetes.

Overall, it will be helpful to differentiate the clinical parameters between patients with symptomatic/asymptomatic neuropathy and patients without neuropathy. Comparison of baseline characteristics between patients presenting neuropathic symptoms with abnormal results of tests and patients without neuropathic symptom with normal results of tests is helpful to identify the clinical risk factors. Different individualized diagnostic modalities are recommended for variable diabetic neuropathy patients, such as different diagnostic strategy for early or low risk neuropathy and late or high risk neuropathy.

CONFLICTS OF INTEREST

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

REFERENCES

1. Nisar MU, Asad A, Waqas A, Ali N, Nisar A, Qayyum MA, Maryam H, Javaid M, Jamil M. Association of diabetic neuropathy with duration of type 2 diabetes and glycemic control. *Cureus* 2015;7:e302.
2. 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.
3. 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.
4. Parsons B, Li C, Emir B, Vinik AI. The efficacy of pregabalin for treating pain associated with diabetic peripheral neuropathy in subjects with type 1 or type 2 diabetes mellitus. *Curr Med Res Opin* 2018;34:2015-22.
5. 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.
6. 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.
7. 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.
8. Paisey RB, Darby T, George AM, Waterson M, Hewson P, Paisey CF, Thomson MP. Prediction of protective sensory loss, neuropathy and foot ulceration in type 2 diabetes. *BMJ Open Diabetes Res Care* 2016;4:e000163.