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Diabetic polyneuropathy and the risk of carpal tunnel syndrome a nationwide, population-based study

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Objective
Carpal tunnel syndrome (CTS) is a common clinical condition and various factors including repetitive wrist movements, obesity, and diabetes mellitus (DM) are considered to be risk factors for CTS. As the prevalence rate of DM increases, the prevalence of its complications is expected to rise. Diabetic polyneuropathy (DPN), which may cause complete sensation loss, is common complication of DM. Several studies revealed that DM influences the development of CTS. However, no study has specifically investigated whether DPN influences the development of CTS. The purpose of this study was to investigate the risk of CTS in DPN patients in Koreans, using data from the Korean National Health Insurance System (KNHIS).

Participants and Methods
This study was conducted based on records from the KNHIS for 12 years from January 1, 2004 to December 31, 2015. Patients were identified as having DPN if they had visited clinics with a diagnosis DPN (ICD-10 code: E1041, E1141, E1341, E1441, G628, G629, G632, G633, G638) more than three times. Among the patients diagnosed with DM, we divided patients into two groups according to DPN presence and assessed the differences about the distribution of sex, age and baseline comorbidities using a chi-squared test between the DPN group and non- DPN group. Also, we assessed the effect of DPN on the risk of CTS using Cox proportional hazards regression analysis which was performed with the adjustment for age, sex, residential area, and comorbidities of hypertension, dyslipidemia, ischemic heart disease, congestive heart failure, and stroke.

Results
In total, 69,811 patients with DM were enrolled in the study: 4,952 in DPN group and 64,859 in non-DPN group. CTS occurred in 3.03% of the DPN group and in 1.78% of the non-DPN group ($p<0.001$). After adjusting for age, sex, residential area, and comorbidities, DPN was associated with an increased risk of CTS occurrence (hazard ratio (HR), 1.328; 95% confidence interval (CI), 1.118-1.577). In sub-analyses, women (HR, 1.453; 95% CI, 1.198–1.761), type 2 DM (HR, 1.357; 95% CI,1.120-1.643) and aged 35 to 64 (HR 1.352;95% CI, 1.113~1.642) were significantly associated with increased risk of CTS occurrence.

Conclusion

The aim of this study was to figure out the risk of CTS in DPN patients and we found that patients with DPN had an increased risk of developing CTS compared non-DPN group, particularly among women, type2 DM and aged 35 to 64.