

– Abstract –

Radial and Sural Nerve Conduction Studies in Diabetic Patients with Asymptomatic Carpal Tunnel Syndrome

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Objective : Diabetic peripheral neuropathy typically begins as a distal symmetric sensory-motor polyneuropathy, as the longest nerves of the lower extremities are believed being affected earlier. Carpal tunnel syndrome (CTS) observed in the course of diabetes mellitus is frequently asymptomatic and the relationship between diabetic neuropathy and CTS has not been clearly described. In order to clarify the relationship between diabetic neuropathy and CTS, we compared the sural amplitude and conduction velocity relative to the radial sensory nerve. We have postulated that an increase in the radial/sural ratio in diabetic patients with CTS might be anticipated if CTS is an early manifestation of diabetic polyneuropathy.

Methods : Nerve conduction studies were done in diabetic patients and normal controls (n=21). The presence of CTS and polyneuropathy were determined.

Results : Eighty-eight diabetic patients were tested with 35 patients (group 1) normal by clinical examination and nerve conduction studies. Twelve patients (group 2) showed CTS, while 41 patients (group 3) showed polyneuropathy. Compared to normal controls, the radial/sural amplitude and velocity ratios showed no difference in group 1 and 2. The radial/sural ratios were larger in group 3. In CTS group, sural nerve conduction velocity was slower than in normal controls.

Conclusions : Slowing of sural nerve conduction in the diabetic patients with CTS suggests that CTS might be related with a polyneuropathy. But comparison of the radial/sural amplitude and velocity ratios supports the possibility of peripheral nerve vulnerability across the carpal tunnel in diabetic patients. Further assessments such as a follow-up nerve conduction studies need to explain these manifestations.

Key Words : Carpal tunnel syndrome, Polyneuropathy, Diabetes mellitus

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Table 1. Demographic Characteristics of the Subjects

	Group I(n=35)	Group II(n=12)	Group III(n=41)	Normal controls(n=21)
Sex(Male:Female)	23:12	0:12	25:16	10:11
Age(yv, mean±SD)	49.0±17.0	63.8±9.0	56.8±14.5	54.6±10.7

Group I: diabetic patients with normal nerve conduction studies

Group II: diabetic patients with asymptomatic carpal tunnel syndrome

Group III: diabetic patients with sensori-motor polyneuropathy

Table 2. Comparison of Radial/Sural Amplitude Ratio

	Group I(n=35)	Group II(n=12)	Group III(n=41)	Normal controls(n=21)
Ratio	1.90±0.70	1.96±1.16	2.60±1.12*	1.80±0.58

Group I: diabetic patients with normal nerve conduction studies

Group II: diabetic patients with asymptomatic carpal tunnel syndrome

Group III: diabetic patients with sensori-motor polyneuropathy

* p=0.021

Table 3. Comparison of Radial and Sural Nerves Conduction Velocities

	Group I(n=35)	Group II(n=12)	Group III(n=41)	Normal controls(n=21)
Radial	45.9±3.39	45.6±3.53	40.2±4.87*	47.4±3.97
Sural	37.8±4.43	36.4±4.23 [§]	22.8±12.0*	39.9±3.94
Ratio ¹	1.23±0.13	1.26±0.14	1.47±0.22*	1.19±0.12

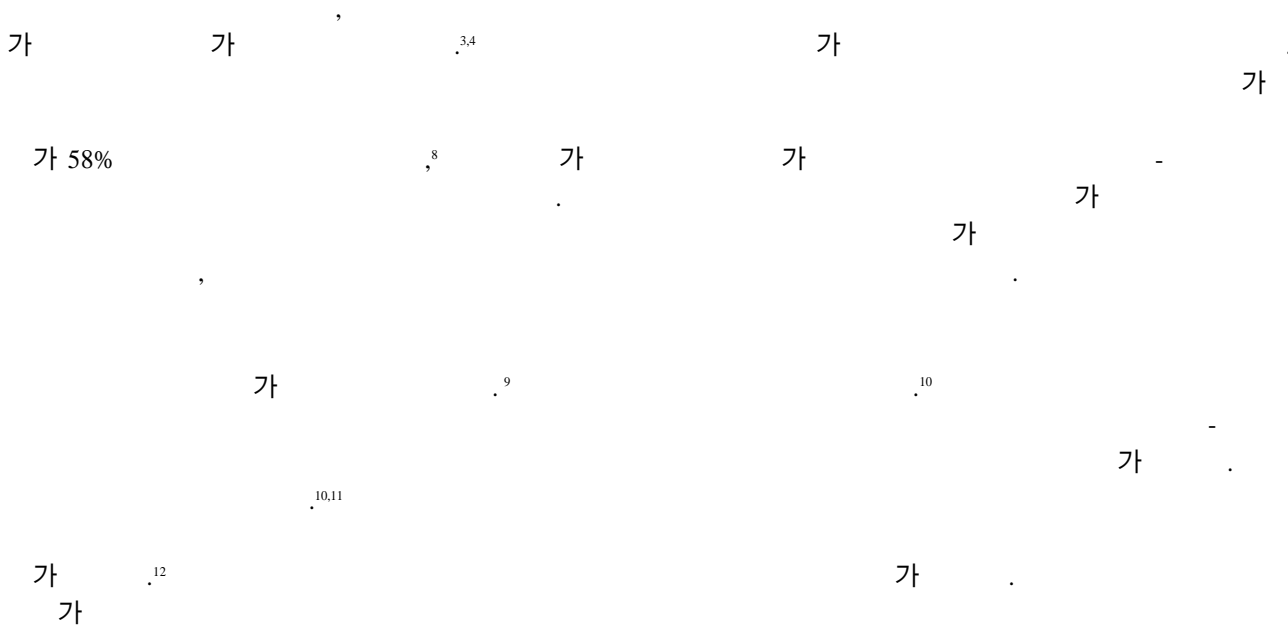
Group I: diabetic patients with normal nerve conduction studies

Group II: diabetic patients with asymptomatic carpal tunnel syndrome

Group III: diabetic patients with sensori-motor polyneuropathy

1. Ratio: radial sensory nerve conduction velocity/sural sensory nerve conduction velocity

* p=0.000, § p=0.027 by t- test between group II and normal controls



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