신경근육재활 및 전기진단
발표일시 및 장소 : **10 월 27 일(토) 14:40-14:50 Room D(5F)**

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Sonographic assessment of carpal tunnel syndrome: A comparison between non-DPN and DPN

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Introduction
Nerve conduction studies are specific for diagnosis of diabetic neuropathy (DPN) or carpal tunnel syndrome (CTS). Recently, the diagnostic accuracy of high-resolution ultrasound has been greatly improved, helping to visualize the anatomic details of the peripheral nerves. Previous studies with ultrasonography have shown that there is no significant difference in the cross-sectional area (CSA) of the median nerve in patients with DPN and CTS compared to that of the patients with CTS alone. However, there are no previous study that compared the CSA of the median nerve according to the severity of CTS. The purpose of this study was to compare the CSA of the median nerve in patients with CTS alone and patients with both DPN and CTS according the severity of CTS.

Method
This study was a prospective study and was performed in healthy controls and patients with clinical symptoms and physical examination suspected of CTS. Ultrasonography was performed on the upper extremities of the controls and the patients. Other than diabetes, patients with another conditions that may cause peripheral neuropathy were excluded, and those with damage due to neck trauma or surgery were excluded as well. DPN is diagnosed according to the criteria modified from The Diabetes Control and Complications Trial. CTS was diagnosed by the modified Steven's criteria. In patients with DPN, CTS was diagnosed according to the criteria of the previous study. The severity of CTS in patients with CTS alone and patients with CTS and DPN was determined using Steven's classification. Ultrasonography was performed on the wrist in neutral position. The CSA of the median nerve was measured at the maximal swelling site in the distal wrist crease.

Results
The CSA values of median nerve at the wrist in healthy control, CTS alone, and CTS and DPN were 8.32 ± 1.16, 14.96 ± 7.07, 16.80 ± 3.47 (Table 1) respectively. In patients with CTS alone, the CSA values of median nerve at the wrist were 11.18 ± 3.00, 16.43 ± 5.32, and 18.10 ± 9.50, respectively, according to the severity. In patients with CTS and DPN, the CSA values of median nerve at the wrist were 12.21 ± 0.45, 16.01 ± 1.93, and 19.91 ± 2.16, respectively, according to the severity. The CSA values of the median nerve at the

wrist showed no significant difference in any severity between the patients with CTS alone and the patients with CTS and DPN (Table 2).

Conclusion

In this study, the CSAs of the median nerve were significantly larger in the CTS patients with or without DPN compared with those of the healthy controls. There was no significant difference between the CSAs of the median nerve of the patients with CTS alone and those of the patients with CTS and DPN. Therefore, the effect of swelling of median nerve by compression in CTS is thought to be greater than the swelling effect of DPN.

Table 1. Median nerve CSA at the wrist

	Normal(n,30)	CTS(n,28)	CTS and DPN(n,10)
Median nerve CSA (mm^2)	8.32 ± 1.16[ab]	14.96 ± 7.07[a]	16.80 ± 3.47[b]

[a]P, [b]P < 0.01

Table 2. Median nerve CSA at the wrist according the severity of the carpal tunnel syndrome

Median nerve CSA (mm^2)	CTS(n, 28)	CTS and DPN(n,10)	p-value
CTS, mild	11.18±3.00 (11)	12.21±0.45 (2)	0.641
CTS, moderate	16.43±5.32 (7)	16.01±1.93 (4)	0.788
CTS, severe	18.10±9.50 (10)	19.91±2.16 (4)	0.539