

– Abstract –

Correlation Studies of Wrist Ratio in Diagnosis of Carpal Tunnel Syndrome(CTS)

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Object : The risk factors for carpal tunnel syndrome(CTS) are closely related to general condition. Numerous studies have reported to assume the causes of CTS. Variables examined included patient's personal characteristics, habits, occupational factors, and avocational hand activity. Especially wrist ratio was investigated as a major determinant of CTS. The purpose of this study was to represent the relationship of the wrist ratio and diagnosis of CTS.

Method : Seventy healthy adults and sixty-five patients with clinical and electrophysiologic evidence of CTS were studied. SNAPs in second and fifth digit were recorded with 14cm antidromic method. The wrist anteroposterior dimension(depth) and the mediolateral dimension(width) by engineering caliper were measured bilaterally in all subject, and the average wrist ratio and difference were determined.

Result : The average wrist ratio of the 34 healthy men was 0.696 in right, 0.694 in left, and those of the 36 healthy women was 0.702 in right, 0.700 in left. Those of 20 CTS men patients was 0.719 in right, 0.718 in left, and 45 CTS women patients was 0.714 in right, 0.717 ± 0.053 in left, respectively. These results showed a significant positive correlation between carpal tunnel syndrome and wrist ratio($P=0.001$).

Conclusion : The results indicate that a large wrist ratio appear to be a risk factor for carpal tunnel syndrome.

Key Words : Wrist Ratio, Carpal Tunnel Syndrome(CTS)

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(median nerve slowing) ~71 65 , 130 (20 , 45
 (gender), (ethnic group), 40 , 90) (Table 1, 2).
 (heredity), (aging), (body mass
 index) (wrist ratio) 2
 .¹ 1983 Johnson ² 14cm
 가 가 (,)
 가 가 가 3.5msec 5
 가 14cm
 가 0.5msec
 가
 가
 ,
 ,
 2.
 1)
 , ,
 ,
 1. ^{2,3} ,
 (Fig. 1).
 24 -
 68 70 , 140 (34 , 36 , T-test
 68 , 72) , SPSS
 , , Phalen , (Win 8.0)
 Tinel ,

Table 1. Characteristics of Subjects

	Control group(n=70)		CTS ¹ patients group(n=65)	
	Male(n=34)	Female(n=36)	Male(n=20)	Female(n=45)
Age(years)	40.35±10.48	43.94±13.19	45.25±14.44	50.46±9.68
Height(cm)	170.64±3.75	160.38±5.55	167.75±8.32	156.35±4.99

1. CTS: Carpal tunnel syndrome

Table 2. Age and Sex Distribution of Subjects

	Control group		CTS ¹ patients group		Total(%)
	Male	Female	Male	Female	
30	6	8	3	0	17(12.6)
31-40	11	8	5	9	33(24.4)
41-50	11	9	4	15	39(28.9)
51-60	5	5	6	13	29(21.5)
60	1	6	2	8	17(12.6)
Total(n ²)	34	36	20	45	135

1. CTS: Carpal tunnel syndrome

2. n: Number of cases

2) Nicolet Viking IV P(Nicolet Instrument Co., USA)

0.696 ± 0.066, 0.694 ± 0.060,
 0.702 ± 0.068, 0.700 ± 0.073,
 0.719 ± 0.051, 0.718 ± 0.061,
 0.714 ± 0.063, 0.717 ± 0.053

2 5 0.012~0.025

(P=0.001)(Table 3).

14cm

2) 14cm

33 0.16msec 2.95 ± 0.13msec, 2.93 ± 0.21msec,
 30Hz 2kHz 2.96 ± 0.19msec 4.58 ± 1.01msec, 4.26 ± 0.47msec
 0.2msec 2msec/division 4.39 ± 1.04msec, 4.26 ± 0.84msec
 20µV/division,

0.07 ± 0.11msec, 0.08 ± 0.19msec
 0.03 ± 0.17msec, 0.04 ± 0.18msec
 1.59 ± 0.91msec,

1) 1.29 ± 0.42msec, 1.43 ± 1.04msec, 1.46 ± 0.80msec

(p<0.05)(Table 4).



Fig. 1. Measurement Method of Wrist Depth and Width with Engineering Caliper

가 가 가

Table 3. Results of Wrist Ratio

	Control group(n=70)				CTS ¹ patients group(n=65)			
	Male(n=34)		Female(n=36)		Male(n=20)		Female(n=45)	
	Right	Left	Right	Left	Right	Left	Right	Left
Wrist Ratio	0.696±0.066	0.694±0.060	0.702±0.068	0.700±0.073	0.719±0.051*	0.718±0.061*	0.714±0.063*	0.717±0.053*

Values are mean±S.D.

* P=0.001

1. CTS: Carpal tunnel syndrome

Table 4. Results of Sensory Nerve Conduction Study

	Control group(n=70)				CTS ¹ patients group(n=65)			
	Male(n=34)		Female(n=36)		Male(n=20)		Female(n=45)	
	Right	Left	Right	Left	Right	Left	Right	Left
Distal latency(msec)								
Median	2.95±0.13	2.93±0.16	2.98±0.21	2.96±0.19	4.58±1.01*	4.26±0.47*	4.39±1.04*	4.26±0.84*
Difference(M-U)	0.07±0.11	0.08±0.19	0.03±0.17	0.04±0.18	1.59±0.91*	1.29±0.42*	1.43±1.04*	1.46±0.80*

Values are mean±S.D.

* P< 0.05

1. CTS: Carpal tunnel syndrome

median slowing 가

가

Johnson^{1,4,5} 가 0.7

Tinel 가

Radecki³ 3.7msec

665 (246 , 419)

1.0msec 가

0.690 0.672 (236) (166)

0.704 0.681 가

0.672 0.655 Gordon⁶ 가

80 4.3msec 가

3.7msec 가 0.7 74%가

24%가

0.7

Stetson⁸ Wyles⁹ 가

Winn¹⁰ 가

Radecki¹¹ 가

Johnson² 가 0.7

median slowing 가

가 3.7msec

~0.025

가

(P=0.001).

가

가

0.012

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