

ORAL PRESENTATION 1-2

통증 및 근골격재활

발표일시 및 장소 : 10 월 18 일(금) 14:15-14:25 Room A(5F)

OP1-2-1

Comparison of High versus Low Energy Extracorporeal Shock Wave Therapy for Carpal Tunnel Syndrome

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Background

Carpal tunnel syndrome (CTS) is one of the common causes of wrist pain in adult population. Recently, many researchers have demonstrated the effects of focused extracorporeal shock wave therapy (fESWT) on CTS. There are several papers that have reported the mechanism and effects of fESWT on CTS, but no treatment protocol for fESWT has been established. Particularly, many controversies exist regarding the proper amounts of power to be applied to the affected nerve. Thus, we developed two different protocols, high energy fESWT and low energy fESWT. The aim of this study is to compare the effect of high energy fESWT and that of low energy fESWT in CTS patients.

Method

We enrolled patients who were confirmed as CTS by electrophysiologic studies. All patients were randomly assigned to the high energy fESWT group (HG) or the low energy fESWT group (LG). The fESWT probe was targeted on the median nerve of the affected side. The probe was oriented perpendicular to the patient's palm, and ultrasound gel was used as a coupling agent. Both group received a session of fESWT that comprised 1000 impulses of shockwave a week for 3 weeks. The energy level of HG was 0.124 mJ/mm², and that of LG was 0.04 mJ/mm². All patients did not receive any other medication or management for pain during the study period. Before the first intervention and after the last intervention, patients were evaluated using Boston Carpal Tunnel Syndrome Questionnaire (BCTQ), pinch strength test, and nerve conduction study of median nerve of the affected side.

Results

Eight patients were recruited in each group. There were no significant differences in the baseline characteristics and initial measurements between two groups (Table 1). After the treatment, all groups showed significant improvement in VAS. There were no significant differences in change of any measurements between the two groups (Table 3).

Conclusion

In this study, we found the therapeutic effects of low energy and high energy fESWT on CTS. The low energy protocol could cause the lesser pain than high energy during the intervention. Thus, the low energy fESWT could be useful method for CTS treatment.

Table 1. Baseline characteristics of two groups

	HG (n=8)	LG (n=8)	p-value
Age	66.14±3.72	68.25±6.22	1.00
Side of involvement			
Rt.	3	5	
Lt.	4	2	
VAS	2.86±0.64	2.50±0.50	1.00
BCTQ	42.29±9.45	42.00±8.49	0.383
Pinch strength			
Tip	6.32±2.21	8.55±1.53	0.165
Lateral	9.21±3.50	5.50±0.46	0.073
Three-jaw	7.90±3.18	5.28±0.15	0.456
NCV of median motor nerve, m/sec	51.86±1.73	49.25±3.27	0.128
CMAP amplitude of median nerv, mV	4.77±10.2	3.05±1.47	0.097
DL of median motor nerve, msec	4.87±0.54	4.50±0.77	0.259
NCV of median sensory nerve, m/sec	27.86±2.85	27.00±1.87	1.000
SNAP amplitude of median nerve, μ V	16.64±11.06	7.75±0.43	0.165
DL of median motor nerve, msec	5.30±0.33	5.40±0.23	0.805

Values are presented as mean±standard deviation.

HG, high energy fESWT group; LG, low energy fESWT group; VAS, Visual Analogue Scale; BCTQ, Boston Carpal Tunnel Syndrome Questionnaire; NCV, nerve conduction velocity; CMAP, compound muscle action potentials; DL, distal latency; SNAP, sensory nerve action potential

Table 2. Change of measurements after treatment

	HG (n=8)		p-value	LG (n=8)		p-value
	Pre	Post		Pre	Post	
VAS	2.86±0.64	1.86±0.64	0.020*	2.50±0.50	1.86±0.35	0.038*
BCTQ	42.29±9.45	41.43±7.54	0.276	42.00±8.49	35.20±5.75	0.061
Pinch strength						
Tip	6.32±2.21	6.50±2.01	0.221	8.55±1.53	8.70±1.61	0.450
Lateral	9.21±3.50	9.26±3.23	0.596	5.50±0.46	5.46±1.53	0.498
Three-jaw	7.90±3.18	7.70±3.13	0.144	5.28±0.15	5.30±0.59	0.260
NCV of median motor nerve,						
m/sec	51.86±1.73	52.14±2.47	0.750	49.25±3.27	51.20±2.36	0.865
CMAP amplitude of median						
nerve, mV	4.77±1.02	4.97±0.97	0.345	3.05±1.47	4.66±1.22	0.107
DL of median motor nerve,						
msec	4.87±0.54	4.70±0.41	0.167	27.00±1.87	28.60±0.49	0.739
NCV of median sensory						
nerve, m/sec	27.86±2.85	28.71±2.76	0.357	49.25±3.27	51.20±2.36	0.865
SNAP amplitude of median						
nerve, μ V	16.64±11.06	16.90±10.84	0.465	7.75±0.43	8.04±0.90	0.249
DL of median motor nerve,						
msec	5.30±0.33	5.16±0.32	0.236	5.40±0.23	5.18±0.17	0.197

Values are presented as mean±standard deviation.

HG, high energy fESWT group; LG, low energy fESWT group; VAS, Visual Analogue Scale; BCTQ,

Boston Carpal Tunnel Syndrome Questionnaire; NCV, nerve conduction velocity; CMAP, compound

muscle action potentials; DL, distal latency; SNAP, sensory nerve action potential

*p<0.05 by Wilcoxon signed rank test.

Table 3. Changes of Measurements between two groups

	HG (n=8)	LG (n=8)	p-value
Δ VAS	-1.00±0.53	-1.00±0.76	1.000
Δ BCTQ	-0.86±2.95	-4.00±3.85	0.128
Δ Pinch strength			
Δ Tip	0.18±0.44	-0.03±0.09	0.535
Δ Lateral	0.05±0.30	-0.05±0.15	0.318
Δ Three-jaw	-0.20±0.32	0.06±0.14	0.128
Δ NCV of median motor nerve, m/sec	0.29±2.31	0.00±0.14	1.000
Δ CMAP amplitude of median nerve, mV	0.20±0.46	0.84±1.20	0.456
Δ DL of median motor nerve, msec	-0.17±0.24	0.57±3.06	0.097
Δ NCV of median sensory nerve, m/sec	0.86±2.75	-0.17±0.27	1.000
Δ SNAP amplitude of median nerve, μV	0.26±0.59	0.37±0.83	0.456
Δ DL of median motor nerve, msec	-0.14±0.29	1.00±1.85	0.902

Values are presented as mean±standard deviation.

HG, high energy fESWT group; LG, low energy fESWT group; VAS, Visual Analogue Scale; BCTQ, Boston Carpal Tunnel Syndrome Questionnaire; NCV, nerve conduction velocity; CMAP, compound muscle action potentials; DL, distal latency; SNAP, sensory nerve action potential

*p<0.05 by Wilcoxon signed rank test.