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Efficacy of Single-Session Focused Extracorporeal Shock Wave Therapy on Lateral Epicondylitis

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BACKGROUND

Lateral epicondylitis (LE) is the most common cause of elbow pain in adult population. Recently, many researchers have demonstrated the effects of focused extracorporeal shock wave therapy (fESWT) on LE which has previously been resistant to conservative treatment. There are several papers have reported the mechanism and effects of fESWT on LE but no treatment protocol for fESWT has been established. Particularly, many controversies exist regarding the proper amount of session to be applied to the affected tissue. Patient compliance can affect the success of treatment. Reducing the repetition session of applied fESWT may affect compliance and lead to successful treatment. Thus, we developed a single-session fESWT for LE and compared the efficacy of the treatment with conservative therapy. The aim of this study is to investigate the therapeutic effects of single-session fESWT on LE.

Method

We enrolled patients who were diagnosed as LE by physicians through clinical symptoms and physical examination. All patients were randomly divided into the study group and the control group. The study group received one session of fESWT (10min 1 time for 4 weeks, total 1 session). fESWT was applied on common extensor origin of the affected elbow. One session of the treatment consisted of 2,000 impulses of shockwave at 0.06-0.12 mJ/mm2. The control group received modalities including hot pack, ultrasound therapy and stretching exercise of the extensor carpi radialis muscle (20min 1 times per week for 4 weeks, total 4 sessions). All patients were educated to refrain from using extensor muscles on their wrist and were instructed how to care by themselves. All patients did not receive any other medication for pain or management during the study period. Before and at 1 month after the treatment, Patients were evaluated using Patient-related Tennis Elbow Evaluation (PRTEE), Mayo elbow Performance Index (MAPI) and Visual Analogue Scale (VAS) of pain perception. VAS was evaluated during resting, cozen test and lifting a chair

Results

Seven patients were recruited in each group. There were no significant differences in the baseline characteristics and initial measurements between two groups (Table 1). One month after the treatment, all groups showed significant improvement in PRTEE and MAPI. However, significant improvement in VAS were observed only in the study group (Table 2). When changes of measurement were compared between two groups, the study group showed more significant improvement than control group on PRTEE, MAPI and VAS during lifting a chair (Table 3).

Conclusion

In this study, we found the therapeutic effectiveness of single-session fESWT on LE. This protocol could save time and increase the compliance of patients, so it can be easily applied in the clinical setting. Thus, the single-session fESWT could be useful method for LE treatment.

Table 1. Baseline characteristics of two groups

	Study group (n=7)	Control group (n=7)	p-value
Age	49.4±6.2	54.6±8.4	0.258
BMI	24.5±2.9	26.1±0.9	0.421
Side of involvement			
Rt.	3	3	
Lt.	2	2	
Duration (month)	12.0±4.2	13.2±2.7	0.690
PRTEE	64.6±19.1	77.0±12.1	0.310
MAPI	78.0±9.8	66.0±17.1	0.222
VAS			
Resting	3.8±1.1	4.2±1.1	0.690
Cozen test	3.8±1.1	4.6±1.7	0.548
Chair lifting	4.8±0.5	5.5±1.8	0.820

Values are presented as mean±standard deviation.

BMI, Body Mass Index; PRTEE, Patient-related Tennis Elbow Evaluation; MAPI, Mayo elbow Performance Index; VAS, Visual Analogue Scale

Table 2. Change of measurements after treatment

	Study group(n=7)			Control group (n=7)		
	Pre	Post	p-value	Pre	Post	p-value
PRTEE	64.6±19.1	44.2±21.4	0.042*	77.0±12.1	68.0±15.7	0.039*
MAPI	78.0±9.8	94.0±8.2	0.034*	66.0±17.1	77.0±11.5	0.042*
VAS						
Resting	3.8±1.1	1.6±0.9	0.034*	4.2±1.1	3.0±1.2	0.063
Cozen test	3.8±1.1	1.6±0.9	0.034*	4.6±1.7	3.4±0.9	0.083
Chair lifting	4.8±0.5	2.6±1.5	0.049*	5.5±1.8	3.8±1.8	0.180

Values are presented as mean±standard deviation.

PRTEE, Patient-related Tennis Elbow Evaluation; MAPI, Mayo elbow Performance Index; VAS, Visual Analogue Scale

*p<0.05 by Wilcoxon signed rank test.

Table 3. Changes of Measurements between two groups

	Study group (n=7)	Control group (n=7)	p-value
Δ PRTEE	-20.4±3.7	-12.5±6.1	0.032*
Δ MAPI	17.0±2.2	10.5±5.6	0.040*
Δ VAS			
Resting	-2.2±0.5	-1.2±0.8	0.095
Cozen test	-2.2±0.5	-1.2±1.1	0.093
Chair lifting	-2.4±1.3	-1.3±1.1	0.048*

Values are presented as mean±standard deviation.

PRTEE, Patient-related Tennis Elbow Evaluation; MAPI, Mayo elbow Performance Index; VAS, Visual Analogue Scale

*p<0.05 by Wilcoxon signed rank test.