

통증 및 근골격재활

발표일시 및 장소 : 10 월 26 일(금) 14:35-14:45 Room B(5F)

OP1-2-3

Effects of assisted sit-up exercise compared to core stabilization exercise on patients with NSLBP

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BACKGROUND

Traditional sit-up exercise is a simple method to strengthen core muscles. However, it can increase the potential of lumbar spine injury during the bending process.

OBJECTIVE

To evaluate the effect of assisted sit-up exercise (SUE) using new training device, HubEX-LEX[®], on strengthening core muscles and improving non-specific low back pain (NSLBP) compared to conventional core stabilization exercise (CSE).

METHODS

Subjects with chronic NSLBP were randomly divided into two groups: SUE (n=18) or CSE (n=18). They participated in 12 sessions of exercise program. Before and after the training, thickness and activity of core muscles were measured using ultrasonogram and surface electromyography, respectively. Pain and disability were assessed using two questionnaires.

RESULTS

Thickness ratios (contracted/rest) of rectus abdominis and external oblique in the SUE group and those of transversus abdominis in the CSE group showed statistically significant difference between before and after exercise ($p < 0.05$). The ratio of activation of internal oblique relative to rectus abdominis and all measurements for pain and disability showed statistically significant improvement in both groups ($p < 0.05$).

CONCLUSIONS

Assisted SUE using new training device can be an effective therapeutic exercise to strengthen dynamic abdominal muscles and improve core muscle activation pattern in NSLBP patients.

Table 1. Pain and disability data at T0 and T1

	SUE group			CSE group			<i>p</i> -value for difference between groups
	T0	T1	<i>p</i> -value	T0	T1	<i>p</i> -value	
VAS	3.0±1.3	1.5±1.3	<0.001*	2.9±0.8	2.1±0.9	<0.001*	0.114
RMDQ	2.4±1.5	1.1±1.6	<0.001*	3.1±2.9	2.4±2.6	0.014*	0.063
ODI	12.8±8.2	8.0±7.7	<0.001*	14.2±11.6	12.0±10.1	0.040*	0.190

CSE: conventional core stabilization exercise; ODI: Oswestry disability index; RMDQ: Roland-Morris disability questionnaire; SUE: assisted sit-up exercise; VAS: visual analogue scale; T0: pre-training; T1: within one week after the end of exercise program; *: statistically significant difference ($p < 0.05$).

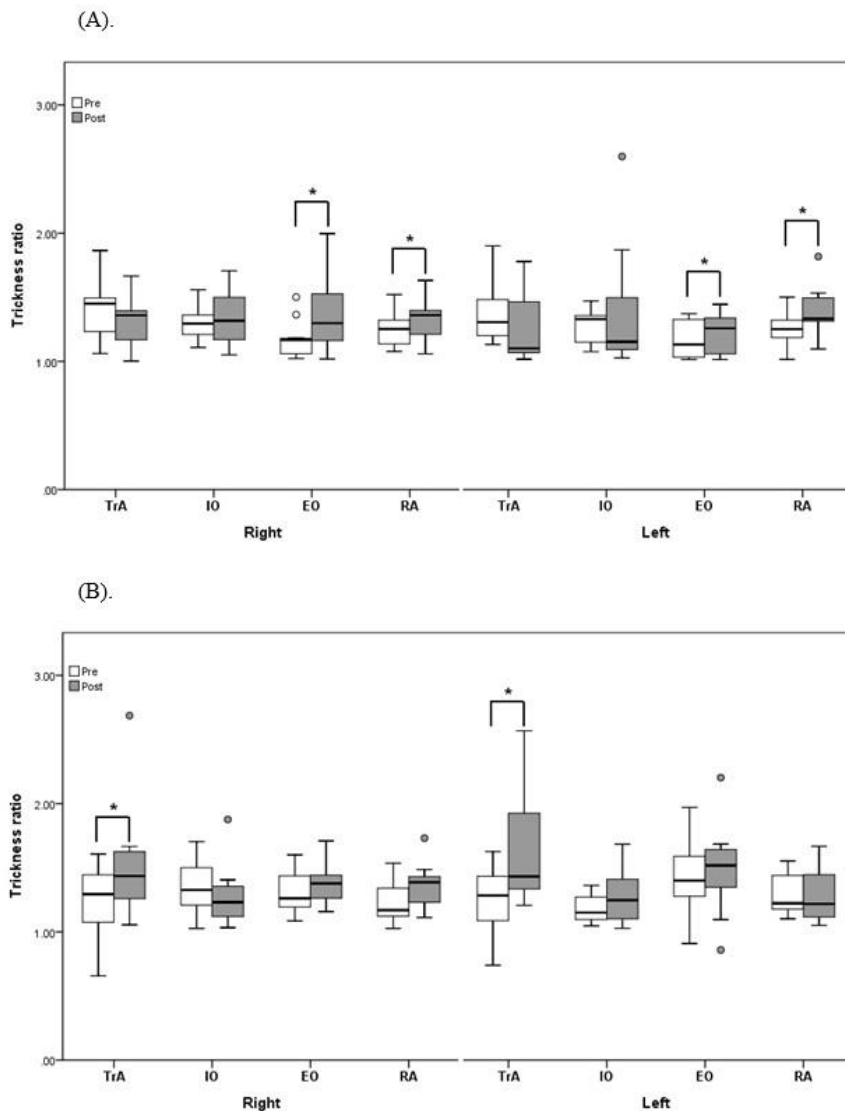


Figure 1. Thickness ratios (contracted/rest) of transversus abdominis (TrA), internal oblique (IO), external oblique (EO), and rectus abdominis (RA) for subjects. (A) Assisted sit-up exercise (SUE) group, (B) Conventional core stabilization exercise (CSE) group.

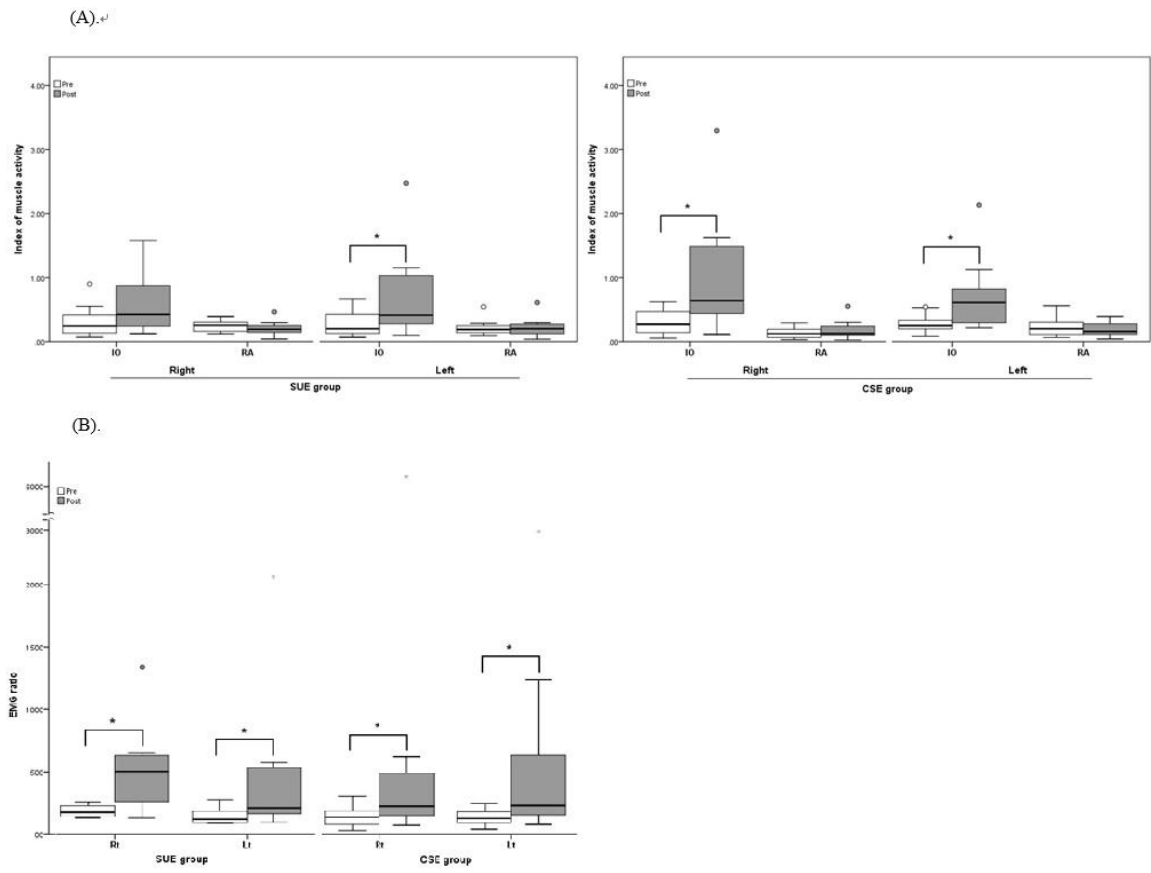


Figure 2. (A) Normalized surface electromyography (sEMG) of rectus abdominis (RA) and internal oblique (IO) muscles in CSE and SUE groups, (B) Ratios of activation (IO/RA) for CSE and SUE groups.