Effect of a Short-term Corrective Exercise Program on Chronic Knee and Hip Pain

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Abstract

The objective of this study was to determine the acute effect following one corrective exercise treatment and the short-term effect of a home-based two-week corrective exercise program on chronic knee and hip pain. Forty

the use of expensive equipment, this type of therapy may be a cost-effective approach for people suffering from chronic knee and/or hip pain.

This study sought to determine the acute effect following one corrective exercise treatment and the short-term effect of a home-based two-week corrective exercise program on chronic knee and hip pain. We hypothesized that: 1) knee and hip pain would not significantly decrease pain rating scores following one corrective exercise treatment, and 2) knee and hip pain would be significantly lower following a two-week corrective exercise program.

Materials and Methods

This study was a simple randomization design. Participants were a convenience sample who were randomly assigned to either the exercise treatment group, which performed corrective exercises for two weeks,

Sitting femur rotations	http://www.egoscue.com/WebMenus/QTVideo/18.html	10 repetitions x 4 sets
Static back abdominal contractions	http://www.egoscue.com/WebMenus/QTVideo/349.html	20 repetitions x 3 sets
Hooklying gluteal contractions	http://www.egoscue.com/WebMenus/ECiseHTML/28.html	20 repetitions x 3 sets
Hooklying knee squeezes	http://www.egoscue.com/WebMenus/QTVideo/26.html	20 repetitions x 3 sets
Airbench	http://www.egoscue.com/WebMenus/ECiseHTML/27.html	1-minute hold
Supine groin stretch (modified)	http://www.egoscue.com/WebMenus/ECiseHTML/31.html	5-minute hold
Supine foot circles-point/flexes	http://www.egoscue.com/WebMenus/ECiseHTML/3.html	10 repetitions x 8 sets
*Total time of E-cise routine=about 45 minutes; with minimal rest between sets (0-30 seconds)		

(p=0.04). However, non-prescription pain medication use was not a significant covariate in any of the statistical analyses. Additionally, there were no significant changes in non-prescription pain medication use from baseline and after weeks 1 and 2 in either group (p=0.29). VAS pain scores in the exercise treatment group did not significantly change after a single corrective exercise routine, after controlling for location of pain, past surgery, and age, at rest (p=0.49; for group x time interaction) or pain during movement (p=0.69; for group x time interaction).

Resting VAS pain scores decreased by 1.40 ± 0.34 cm in the exercise group and 0.48 ± 0.32 cm in the control group, although the difference between groups did not reach statistical significance (p=0.06). After controlling for initial pain level, location of pain, past surgery, and arthritis, there was no significant decrease over time for pain at rest as measured by daily resting VAS pain scores (p=0.52).

On the other hand, movement VAS pain scores (Figure 1) decreased on average by 0.11 ± 0.03 cm/d in the exercise group (p=0.002), while there was a non-significant decrease of 0.02 ± 0.03 cm/d in VAS pain scores in the control group (p=0.47). The difference between the groups was statistically significant (p=0.02) after controlling for significant covariates (initial pain level, location of pain, past surgery, arthritis). Compared to baseline, pain during movement at the end of the second week decreased by 3.77 ± 0.49 cm in the exercise group and 1.34 ± 0.46 cm in the control group (p=0.001 for group x time interaction).

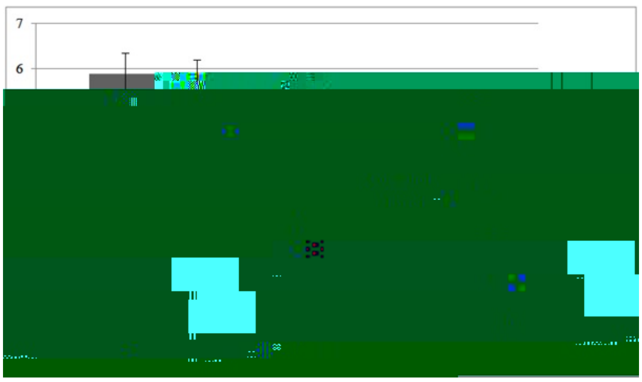

Figure 1: VAS pain (cm) during movement, by group. Data are presented as means ± standard error bars (y-axis = VAS pain rating scores from 0-7). *Statistically significant difference from baseline (p=0.001) after controlling for age, past surgery, and location of pain. **Statistically significant difference between groups (p=0.02) after controlling for age, gender, BMI, past surgery, arthritis, and location of pain.

Total WOMAC scores decreased significantly in the exercise treatment group over time, while total WOMAC scores in the control group did not change significantly (Table 3, Figure 2). Although, there were non-significant decreases in total WOMAC (p=0.11), function (p=0.09), and pain subscores (p=0.54) in the exercise treatment group after the first week; by the end of week 2, decreases in total WOMAC (p=0.001), function (p=0.002), and pain (p=0.008) subscores were statistically significant (Table 3). Total WOMAC, function, and pain subscores were significantly lower (p=0.02, p=0.03, p=0.01, respectively) in the exercise treatment group compared to the control group at the end of week 2. Compared to baseline, the exercise group showed a 60%, 67%, and 51% relative decrease in total WOMAC, function, and pain subscores, respectively at the end of week 2.

		Week 1	**Week 2**
WOMAC total	Treatment Group	-10.19 ± 3.92 (p=0.11)	-16.15 ± 3.92* (p=0.001)
	Control Group	-0.83 ± 3.92 (p=1.00)	0.11 ± 3.92 (p=1.00)
WOMAC function	Treatment Group	-7.10 ± 2.65 (p=0.09)	-10.35 ± 2.65* (p=0.002)
	Control Group	0.10 ± 2.65 (p=1.00)	-0.10 ± 2.65 (p=1.00)
WOMAC pain	Treatment Group	-1.65 ± 0.95 (p=0.54)	-3.35 ± 0.95* (p=0.01)
	Control Group	0.50 ± 0.95 (p=1.00)	0.20 ± 0.95 (p=1.00)

Results are described as mean ± standard error. *Significant at the 0.05 level after controlling for age, gender, BMI, past surgery, arthritis, and location of pain.

Discussion

This study evaluated the effect of a corrective exercise program on pain and function in participants with chronic knee and/or hip pain after one treatment, at one week and after two weeks of performing exercises. The resulting data showed a significant decrease in pain over the two weeks, as well as a significant improvement in functional

Future studies that involve long-term follow-up should be employed to determine whether or not beneficial effects are sustained over time. In addition, it is important that future EM corrective exercise research measure changes in postural alignment, more effectively document and statistically control various lifestyle variables, and directly supervise EM corrective exercise routines to confirm participation.

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