



Effects of Motor Control Exercise Vs Muscle Stretching Exercise on Reducing Compensatory Lumbopelvic Motions and Low Back Pain: A Randomized Trial

Kyue-nam Park, PhD,^a Oh-yun Kwon, PhD,^b Chung-hwi Yi, PhD,^c Heon-seock Cynn, PhD,^c Jong-hyuck Weon, PhD,^d Tae-ho Kim, PhD,^e and Houg-sik Choi, PhD^f

ABSTRACT

Objectives: The purpose of this study was to investigate the effectiveness of a 6-week motor control exercise (MCE) vs stretching exercise (SE) on reducing compensatory pelvic motion during active prone knee flexion (APKF) and intensity of low back pain.

Methods: Thirty-six people in the lumbar-rotation-extension subgroup were randomly assigned equally into 2 exercise groups (18 people in each an MCE or SE group). A 3-dimensional motion-analysis system was used to measure the range and onset time of pelvic motion and knee flexion during APKF. Surface electromyography was used to measure the muscle activity and onset time of the erector spinae and the hamstrings during APKF. The level of subjective low back pain was measured using a visual analog scale.

Results: The MCE group had more significant decreases in and delay of anterior pelvic tilt, pelvic rotation, and erector spinae muscle activity during APKF, as well as reduced intensity of low back pain compared with the SE group ($P < .05$).

Conclusions: For rehabilitation in patients in the lumbar-rotation-extension subgroup, MCE was more effective than SE in reducing compensatory pelvic motion and muscle activity during APKF and minimizing low back pain.

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Key Indexing Terms: *Classification; Exercise; Low Back Pain; Muscle Stretching Exercises*

^a Department of Physical Therapy, Jeonju University, Jeonju, South Korea.

^b Laboratory of Kinetic Ergocise Based on Movement Analysis, Department of Physical Therapy, Yonsei University, Wonju, South Korea.

^c Department of Physical Therapy, Yonsei University, Wonju, South Korea.

^d Department of Physical Therapy, Joongbu University, Geumsan, South Korea.

^e Department of Physical Therapy, Daegu University, Gyeongsan, South Korea.

^f Department of Physical Therapy, Hanseo University, Seosan, South Korea.

Corresponding author: Oh-yun Kwon, PhD, 234 Maeji-ri, Heungeup-Myeon, Wonju, Kangwon-Do, 220-710, South Korea. (e-mail: kwonoy@yonsei.ac.kr).

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INTRODUCTION

Low back pain (LBP) is a prevalent musculoskeletal disorder, with approximately 70% to 90% of adults suffering from an episode of LBP sometime in their lives, 50% having a recurrent episode, and 5% to 10% developing chronic and potentially disabling LBP.^{1,2}

To manage nonspecific LBP, subgrouping and classifying LBP by the movement direction-based mechanism of provocation or relief of symptoms has proven more valuable than performing a pathology-based diagnosis.³⁻⁷ Sahrman⁵ and Van Dillen et al⁸ developed a classification system based on movement impairment and divided LBP problems into 5 subgroups: lumbar flexion, lumbar extension, lumbar rotation, lumbar-rotation-flexion, and lumbar-rotation-extension.

The lumbar-rotation-extension subgroup is the most common among the 5 subgroups of LBP.^{5,9} Patients are considered to be in the lumbar-rotation-extension subgroup