

Comparison of Trunk and Hip Muscle Activities and Anterior Pelvic Tilt Angle during Three Different Bridging Exercises in Subjects with Chronic Low Back Pain

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Abstract : Bridging exercise in supine position with the hips and knees flexed have been commonly performed as one of the therapeutic exercises and is a comfortable and pain-free position to most individuals with chronic low back pain (CLBP). Many previous studies have investigated the beneficial way of performing bridging exercises to improve activation of abdominal and gluteal muscle and reduce muscle activity of hamstrings (HAM) and erector spinae (ES) and compensatory lumbopelvic motion. The purpose of this study was to compare the effects of three different bridging exercises on the HAM, ES, gluteus maximus (Gmax), gluteus medius (Gmed), and transverse abdominis/internal abdominis oblique (TrA/IO) activities and anterior pelvic tilt angle in subjects with CLBP. Seventeen subjects with CLBP participated in this study. They performed bridging under three different conditions (with 30° hip abduction, isometric hip abduction, and isometric hip adduction). Surface electromyography was used to measure muscle activity, and the ImageJ software was used to calculate anterior pelvic tilt angle. One-way repeated-measures analysis of variance was used to assess the statistical significance of the measured variables. HAM activity was significantly lower in bridging with 30° hip abduction and isometric hip abduction than in bridging with isometric hip adduction. Gmax and Gmed activities were significantly greater in bridging with isometric hip abduction than in bridging with 30° hip abduction and isometric hip adduction. TrA/IO muscle activity was significantly greater and anterior pelvic tilt angle was significantly lower in bridging with isometric hip adduction than in bridging with 30° hip abduction and isometric hip abduction. Bridging with isometric hip abduction using Thera-Band can effectively reduce HAM activity, and increase Gmax and Gmed activities in subjects with CLBP. Bridging with isometric hip adduction using a pressure biofeedback unit can be a beneficial exercise to improve TrA/IO activity and minimize anterior pelvic tilt in subjects with CLBP.

Keywords : bridging exercise, electromyography, low back pain, lower limb exercise

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