

Pelvic Stabilization During Resistance Training: Its Effect on the Development of Lumbar Extension Strength

James E. Graves, PhD
Michael L. Pollock, PhD
Scott H. Leggett, MS
Dan Foster

Dina C. Webb, PT
Jan Matkozich
David M. Carpenter, MS
Joseph Cirulli

Abstract

The purpose of this study was to evaluate and compare resistance exercise training with and without pelvic stabilization on the development of isolated lumbar extension strength. Isometric torque of the isolated lumbar extensor muscles was measured at seven positions through a 72 degree range-of-motion on 47 men and 30 women before and after 12 weeks of variable resistance lumbar extension training. Subjects were assigned to either a group that trained with pelvic stabilization (P-STAB, $n = 21$), a group that trained without pelvic stabilization (NO-STAB, $n = 41$), or a control group that did not train ($n = 15$). Subjects trained once a week with 8 to 12 repetitions to volitional exhaustion. The P-STAB and NO-STAB groups showed significant ($p \geq 0.05$) and similar increases in the weight load used for training (P-STAB = $24.1 \pm 9.4\text{kg}$; NO-STAB = $19.4 \pm 11.0\text{kg}$) during the 12-week training period. In contrast, posttraining isometric torque values describing isolated lumbar extension strength improved only for the P-STAB group (23.5%, $p \leq 0.05$) and not for the NO-STAB group (-1.2%, $p \leq 0.05$) relative to controls. These data indicate that pelvic stabilization is required to effectively train the lumbar extensor muscles. The increased training load for the NO-STAB group is probably the result of exercising the muscles involved in pelvic rotation (hamstring and buttock muscles).