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Effect of 12 and 20 Weeks of Resistance Training on Lumbar Extension Torque Production

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Abstract

This study compared the effect of varied training frequencies on the development of isometric lumbar extension torque (strength) over 12- and 20-week training periods. Fifty-six subjects were randomly assigned to training once every other week (training group 1, n=10), once per week (training group 2, n=12), twice per week Training group 3, n=12), or three times per week (training group 4, n=7) or to a nontraining control group (n=15). Training consisted of one set of 8 to 12 variable-resistance lumbar extensions to volitional muscular fatigue. Prior to and following 12 and 20 weeks of training, subjects were given a test that evaluated isolated isometric lumbar extension torque in a seated position at seven positions (angles) through a 72-degree range of motion. The control group showed no change in isometric torque. All training groups showed significant increases in lumbar extension torque at 12 and 20 weeks of training, whereas no significant differences were found among the groups with respect to the magnitude of torque gained. Pooled training data showed a significant timexangle interaction at 12 weeks and a continuing trend at 20 weeks, indicating that the shape of the isometric torque-angle curve changed as a result of training. This effect was due to greater increases in isometric torque at the fully extended position than at the fully flexed position at 12 weeks (92% versus 16%, respectively) and at 20 weeks (123% versus 17%, respectively). These findings show that isometric lumbar extension torque increases occur mainly within the first 12 weeks of training, although additional gains in the more extended positions can be expected when training is continued through 20 weeks. These data also indicate that training once every other week or once per week is as effective as training twice per week or three times per week for increasing isometric lumbar extension torque over 20 weeks.

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