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ORIGINAL RESEARCH

TRANSVERSUS ABDOMINIS ELASTICITY DURING VARIOUS EXERCISES: A SHEAR WAVE ULTRASOUND ELASTOGRAPHY STUDY

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ABSTRACT

Background: Although the transversus abdominis (TrA) is considered to play a significant role in maintaining trunk stability, there is little information regarding the type of exercise that best facilitates the development of tension in the TrA. Muscle elasticity shows a strong association with muscle tension. Shear wave ultrasound elastography provides a means by which the tension of TrA can be noninvasively estimated, by quantifying it's elasticity.

Purpose: The purpose of this study was to examine the TrA elasticity during several exercises as measured by shear wave ultrasound elastography, and to determine which of the studied exercises demonstrated the greatest tension.

Methods: Ten healthy men performed abdominal hollowing, abdominal bracing, a hanging deadlift, elbow–toe plank with contralateral arm and leg lift, and back bridge with single leg lift. During these exercises, TrA elasticity was measured using ultrasound elastography. The same measurements were performed at rest before and after these exercises.

Result: No significant difference was found for rest conditions measured before and after the exercises ($p = 0.63$). Abdominal bracing showed a significantly higher elasticity value than the other exercises ($p < 0.05$), except for hanging deadlift.

Conclusion: Among the exercises, abdominal bracing was the exercise that elevated the TrA tension the most. The present results also suggested that hanging deadlift also produced comparably high TrA tension with abdominal bracing.

Level of Evidence: 2c

Key words: abdominal hollowing, abdominal bracing, deadlift, bridge exercise

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