BACKGROUND AND PURPOSE

Effects of Low Back Manual Therapy on Perceived Status Change and Knee Extensor Torque

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METHODS

• All subjects (cases and controls) reported for two testing days that were separated by 48 hours
  • Day 1:
    • Isometric knee extensor torque obtained from dynamometer (Biodex System 3, Biodex Medical, Shirley, NY)
    • Knee flexion angle = 60 degrees; average torque (AT) output for 5-second maximum effort
    • Average of 3 successive repetitions for right extremity; 10% interval between repetitions
    • Second isometric testing trial performed with identical procedures after 15 minutes of inactivity
  • Day 2:
    • Isometric testing performed with identical procedures to those used for day 1
    • Following initial isometric testing trial; MT applied to low back, over-QL
    • MT tool (AcuForce® 7.0, Magister Corp., Chattanooga, TN) used to administer soft tissue treatment
    • MT tool weight = 7 lbs (3.2 kg); no additional force was applied
    • Warm-up, cross-fiber, and trigger point techniques administered (Figures 1 & 2)
  • Global Rating of Change (GRC) scale used to assess perception of any change in status (positive or negative)
    • 15-level response option (+7 to -7; 0 designation for no change)
  • Second isometric testing trial performed with identical procedures after administration of MT
  • Analysis procedures: Repeated measures ANOVA, receiver operating characteristic (ROC) analysis

RESULTS

• AT mean and standard deviation for each combination of day and trial for cases and controls presented in Table 1
  • Repeated measures ANOVA demonstrated a day X trial interaction (F1,24=4.64; p=.03)
  • Greater AT gain from trial 1 to trial 2 on day 2 (Figure 3)
  • Greater AT gain observed for cases, but no significant difference between groups (F1,23=37.13; p=.017)
  • ROC analysis of AT gain in relation to case status (ODI ≥10 vs. control status (ODI <10) presented in Figure 4
  • AT gain of approximately 6 ft lbs or more following MT found to be 6 X more likely for cases than controls
  • Median ODI score was 0 for controls (range 0-4) and 13 for cases (range 10-34)
  • ROC analysis of AT gain in relation to GRC change (≥4 vs. <4 units) presented in Figure 5
  • AT gain of approximately 11 ft lbs or more following MT found to be 14 X more likely for GRC ≥4 than <4 units
  • Median was +4 GRC units for cases (range 2.4-6.0) and 0 GRC units for controls (range 0-6 units)

CLINICAL RELEVANCE

• AcuForce® 7.0 MT focused on the QL can increase quadriceps maximum voluntary torque output
  • Subjects with ODI ≥ 2 (100% of cases; 0% of controls) demonstrated greater torque output gain
  • 71% of subjects (17/24) reported feeling more flexible and relaxed, which was reflected by GRC improvement
  • Subjects with GRC ≥ 4 gain (88% of cases; 25% of controls) demonstrated greater torque output gain
  • The results of this study provide substantial evidence to support the use of a specific MT technique
  • Stimulation of QL appears to have a disinhibition effect on voluntary quadriceps activation

REFERENCES