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Samantha Gunderson
Western Washington University

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THE EFFECTS OF A FIVE-WEEK EXERCISE INTERVENTION USING EMG BIOFEEDBACK ON SCAPULAR STABILIZER MUSCLE ACTIVATION AND SCAPULAR KINEMATICS

Samantha R. Gunderson, Jun G. San Juan, David N. Suprak, and Wren L. Cunningham

1Kinesiology and Physical Education Program, Dept. of Physical Education, Health and Recreation Western Washington University, Bellingham, WA, USA.

Introduction

- Electromyography (EMG) biofeedback has not been investigated as a preventative tool for those at risk for developing shoulder pathologies.
- Observing muscle activation on the screen allows the subjects to obtain the correct movement for the exercises performed.
- Desired scapular kinematics during scapular plane humeral elevation:
  - Upward rotation
  - External rotation
  - Posterior tilt
- This study investigated changes in scapular kinematics, and muscle activation patterns as a result of EMG biofeedback.
- Hypotheses:
  - The scapula will increase in upward rotation, posterior tilting and external rotation.
  - There will be a decrease in upper trapezius activity, with an increase in serratus anterior and lower trapezius activity.

Methods - Protocol

- Subjects divided into 2 groups
  - Exercise w/ biofeedback
  - Exercise only
- Humeral elevation in scapular plane
  - Baseline, week 6 & 8
- Subjects performed a warm up of pendulum swings
- Scapular stabilization exercises performed
  - I, W, T, Y (Figure 2 A, B, C, & D)
  - 1 x 10

Results – Graphical Representation

- Upward/Downward Rotation: Exercise with Biofeedback
  - Baseline, Week 6, Week 8
- Upward/Downward Rotation: Exercise Only
  - Baseline, Week 6, Week 8
- Upper Trapezius Muscle Activation: Exercise Only
  - Baseline, Week 1, Week 6, Week 8

Discussion & Conclusion

- Exercise intervention not long enough
  - 6 weeks in line with current recommendations
- Healthy population
  - Could have already been within normal ranges for scapular kinematics
- Future studies should investigate a longer program with a pathological population

References