OC43: Shoulder muscle recruitment in subjects with previous episodes of pain

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Introduction: The shoulder complex joint is an extremely mobile joint and its stability is guaranteed mainly by the glenohumeral and scapular muscles. The recruitment patterns of these muscles play an important role in the coordination of scapular motion during humeral elevation. Some studies report that the muscles recruitment patterns are altered in the presence of pain.

Objectives: To analyze the muscle activation timings and the recruitment temporal sequence of the shoulder complex muscles during shoulder elevation in the scapular plane, in subjects with and without previous history of shoulder pain.

Materials and Methods: 23 subjects with history of shoulder pain in the last 12 months and 25 asymptomatic subjects in the last 2 years participated in the present study. The electromyographic activity of serratus anterior, infraspinatus, middle deltoid, upper trapezius and lower trapezius muscles was acquired during shoulder elevation in the scapular plane. The signal was used to assess the muscle activation timings and muscle recruitment temporal sequences, in both groups. T-test and Mann-Whitney U tests were used to statistical analysis with a significance level of 0.05.

Results and Discussion: Significant differences have been observed in the activation timings in the serratus anterior (p=0.024), lower trapezius (p=0.004) and infraspinatus (p=0.017) muscles, reflecting an activation delay of these muscles in subjects with shoulder pain episodes. High variability was observed in the muscle recruitment temporal sequences in both groups.

Conclusion: Generally, it can be concluded that the presence of previous shoulder pain is related with a delayed muscle activation of shoulder stabilizers.

References

1. Cools, A. M., Witvrouw, E. E., Declercq, G. A., Danneels, L. A., & Cambier, D. C. (2003). Scapular muscle recruitment patterns: trapezius muscle latency with and without impingement symptons. American Journal of Sports Medicine, 31(4), 542-549.