Abstract

Thesis Title:

The Effect of Kinesio Tape (KT) on the Muscle Activation of the Long Head of the Biceps in Baseball Players.

Objective:

KT is one of several treatment techniques in injury prevention and treatment for high demand movements, such as overhead throwing. The baseball throwing motion, or the overhead throwing motion, places tremendous stress on the shoulder where coordination of its subsequent musculature, such as the long head of the biceps, are crucial. As a result, injuries do occur. However, the acute effect of KT on the muscular activity of the LHB is not well known. The aim of this thesis is to verify that the application of KT to the skin located superficially to the Long Head of the Biceps increases its activity in the baseball throwing motion.

Methods:

The research sample included 21 active Czech Extraliga baseball players (21 male, aged 25.3 ±5.9 years, height 183.2 ±6.9 cm, weight 83.8 ±11.1 kg, years baseball of participation 17.1 ±6.5 years), which reported no current or recent shoulder pain or injury. The surface Electromyograph (sEMG) of the muscle activity from each subject was collected using a Bittium Biomonitor transmitter and receiver, model ME6000 (Bittium Inc. Oulu, Finland). There was recorded Maximum Voluntary Isometric Contraction (MVIC) activity of the Long Head of the Biceps (LHB), Long Head of the Triceps (LHT), Pectoralis major (PM), and Upper Trapezius (UT) before each of the three testing sessions. Measurement was taken with the right arm in 90º of unsupported shoulder abduction and 90º of elbow flexion with dynamic shoulder rotation with 1m of yellow Theraband for resisted internal rotation. First measurement was taken with no KT applied and then the second measurement with red RockTape brand KT applied to the skin from the proximal origin to the distal insertion of the LHBM. The right upper limb was used to limit possible cardiac crosstalk. There was approximately a 20 second lag time between the first and second measurement. Stability of EMG outcomes were evaluated by looking at the correlation between

each trail. The variability of the results and the possibility of using data from all repeated measurements were verified by Friedmann's non-parametric ANOVA test. Differences in muscle activity between before and after application of KT were analyzed while looking at each muscle by non-parametric paired Wilcoxon signed-rank T-test.

Results:

Results of this study showed that muscle activity in the LHBM decreased after application of KT. However, from a clinical and statistical point of view, the impact of KT was rather ambiguous. Based on the results, the research hypothesis must be rejected. KT did not lead to a significant increase in muscle activity in the LHBM. The only significant change was a decrease in muscle activity in the UT, $p<0.023$. Nevertheless, the degree of measurable decrease in muscle activity proved to be of little clinical significance, Effect Size $r=0.26$

Conclusion:

The results of our study show that the application of KT need not have acute effect on the muscle activity of the muscle to which it is applied. This study addressed the acute response of the muscular system, but the results show that KT is not a sufficiently sensitive stimulus for the desired response. Therefore, it may be necessary to apply KT for a longer period of time to provide a more provable effect. For future research, we recommend a careful selection of participants and investigative movement patterns to be evaluated, as we assume that movement experience can bias the heterogeneity and variance of EMG.

Keywords:

Baseball, Long Head of the Biceps, Kinesio Tape**,** Kinesiology tape, RockTape, Overhead Throwing, sEMG, surface electromyograph