COLIN HOTT & SHAWN M. REESE, Dept of Health and Human Performance, Fairmont State University, Fairmont, WV 26554. Assessing Muscle Cell Excitability Following Fatiguing Vertical Jump Performance: A Preliminary Analysis

Traditional evaluation of the muscle electrical activity (m-wave) includes the analysis of the entire waveform. However, research shows specific physiological meaning within waveform components that may be more relevant to some applications. The purpose of this study was to evaluate the efficacy of the activation phase (1st-phase) of the waveform before and after fatigue. Four participants had their tibial nerve stimulated to evoke a maximal m-wave response in the medial head of the gastrocnemius at 120% resting intensity while standing. Following baseline, participants performed repeated maximal vertical jumps until fatigue- determined as three consecutive jumps below 80% of maximal vertical jump performance. Immediately after the final jump, M-waves were recorded again. Amplitude, and duration of the whole M-wave versus the 1st phase only were compared. Two (amplitude and duration), two-way repeated measures ANOVAs were conducted to assess the differences in analysis methods of the m-wave pre and post fatigue. There was no time × method interaction for either amplitude or duration ($p= 0.189$, $\eta^2_p = 0.489$ and $p= 0.563$, $\eta^2_p = 0.123$) respectively. However, both methods showed a slight increase in both amplitude and a decrease in duration (+0.23mV, -1.6ms) for whole wave vs 1st phase (+.081mV, -0.4ms). While this suggests that analysis of the 1st phase is not more reliable than the whole waveform, it does suggest that the 1st phase provides valid analysis of muscle cell excitability while reducing the probability of mechanical artifacts in the waveform.

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