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Additive Effect of Contract-Relax-Antagonist-Contract Stretching and Petrissage Massage on Motoneuronal Excitability

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ABSTRACT

Introduction: Muscle tone abnormalities are mainly witnessed in individuals inflicted with nervous system disorders. Cause of hypertonicity is due to increased Motoneuronal Excitability (MNE) whereas decreased MNE leads to hypotonicity. Changes in MNE are also observed in healthy individuals such as in muscle spasm or increased muscle tension. Also decreased MNE (hypotonia) is seen in healthy individuals such as after long-term cast immobilisation or with impaired proprioception or sensation. In healthy individuals, especially in athletic populations it is always desired to decrease muscle tension to achieve muscle relaxation post fatigue or during spasm. Numerous physiotherapy methods are employed for this purpose but massage and stretching remains the most preferred modalities. Petrissage and Contract-Relax-Antagonist-Contract (CRAC) stretching have been reported to be most effective methods for reducing MNE hence muscle tension, but the effectiveness of these methods have not been validated by objective neurophysiological tests. So present study investigated combined effect of Petrissage massage and CRAC stretching on reducing muscle tension via motor pool excitability using H-reflex test which is considered a direct measure of MNE.

Aim: To investigate the additive effects of Petrissage and CRAC stretching technique on motoneuronal excitability in healthy individuals through H-reflex methodology.

Materials and Methods: Thirty healthy participants were randomly assigned to two groups. Group A (n=15) received Petrissage massage (wringing) for 3-6 minutes, followed by CRAC stretching, while Group B received only CRAC stretching. Electromyography unit was used to measure parameters of H-reflex (M-latency, M-amplitude, H-latency, H-amplitude, and H/M ratio) before and immediately after the intervention.

Results: There was significant difference observed in H-amplitude ($t=2.14$, $p=0.04$) and H/M ratio ($t=2.46$, $p=0.02$) in Group A as compared to the individuals of Group B.

Conclusion: The results suggest that combining Petrissage with CRAC stretching notably decreased motoneuronal excitability in healthy individuals, although the inter subject variability should not be ignored.

Keywords: H-reflex, M-latency, Wringing