E-Poster

EP-498

Central Electrophysiological Effects of Tibialis Anterior Focal Muscle Vibration in Healthy Individuals: An EEG Study

Topic: Neuroscience

Hugo Bessaguet[1], Bruno Fernandez[1], Diana Rimaud[1], Etienne Ojardias[1], Pascal Giraux[1], Thomas Lapole[2], Ahmed Adham[1]

[1]*PRM, CHU Saint-Etienne, Saint-Etienne, France*
[2]*Physiology Lab, Laboratoire Interuniversitaire de Biologie de la Motricité, Saint-Etienne, France*

BACKGROUND

Focal Muscle Vibration (FMV) is an emerging technique that can be used for lower limbs rehabilitation in subacute and chronic post-stroke individuals, for motor recovery and spasticity reduction. However, little is known about central electrophysiological effects. The aim of this study was to explore the neurophysiological effects induced by a single FMV session in healthy individuals.

METHODS

An observational experimental study was conducted in the Saint-Etienne University Hospital Centre (NCT04737018). We recruited healthy and voluntary adults with no previous neurological or orthopaedic history. Electroencephalography (EEG) data was recorded while individuals performed 30 standardized right ankle dorsiflexions movements before and after an homolateral tibialis anterior muscle FMV session (30 min, 100 Hz). An OpenSesame TTL trigger was sent on the EEG recording at the beginning of each experimental condition for accurate synchronization of the visual cues displayed on a computer screen facing individuals. For each electrode, ERD (event-related desynchronization) and ERS (event-related synchronization) magnitudes were expressed as a percentage of the power in the defined time and frequency window relative to the power measured during the corresponding baseline and were expressed as a percentage change.

RESULTS

In the Alpha band during ankle dorsiflexion, the time course analysis of the signal over C3 electrodes showed a bilateral desynchronization, starting about 400 ms after the ankle dorsiflexion instruction and ending about 1500 ms after the ending instruction. Global cortical maps showed that the desynchronization over central-right and centro-parietal electrodes was stronger in pre-vibration condition as compared to post-vibration condition. We identified in the beta band during/after ankle dorsiflexion a very weak rebound centered over central and precentral, which did not reach statistical significancy

CONCLUSION

This study provides neurophysiological theoretical support in heathy subjects showing a shift in sensorial attention (hemispheric lateralization in alpha band), after tibialis anterior FMV. This could be later tested in post-stroke individuals.

Statement of Disclosures

None

Corresponding Author:
Hugo Bessaguet
PRM, CHU Saint-Etienne, Saint-Etienne, France
Email: hugo.bessaguet@univ-st-etienne.fr

Doi: 10.5606/archisprm.2026.EP-498