Hoffmann reflex is increased after 14 days of daily repeated Achilles tendon vibration for the soleus but not for the gastrocnemii muscles

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Abstract: In a previous study, Achilles tendon vibrations were enough to improve the triceps surae (TS) activation capacities and also to slightly increase TS Hoffmann reflex (H-reflex) obtained by summing up soleus (Sol) and gastrocnemii (GM and GL) EMGs. The purpose of the present study was to analyze separately Sol and GM or GL reflexes to account for different effects of the vibrations on the reflex excitability of the slow soleus and of the gastrocnemii muscles. A control group \( (n = 13) \) and a vibration group \( (n = 16) \) were tested in pre-test and post-test conditions. The Achilles tendon vibration program consisted of 1 h of daily vibration (frequency: 50 Hz) applied during 14 days. Maximal Sol, GM and GL H-reflexes, and M-waves were recorded, and their \( H_{max}/M_{max} \) ratios gave the index of reflex excitability. After the vibration protocol, only Sol \( H_{max}/M_{max} \) was enhanced \( (p < 0.001) \). The enhanced Sol reflex excitability after vibration is in favor of a decrease in the pre-synaptic inhibition due to the repeated vibrations and the high solicitation of the reflex pathway. Those results of a short period of vibration applied at rest may be limited to the soleus because of its high density in muscle spindles and slow motor units, both structures being very sensitive to vibrations.

Key words: Achilles tendon, vibration, soleus, gastrocnemii, Hoffmann reflex.