Whole body vibration in the static modified push-up position in untrained healthy women stimulates neuromuscular system potentiating increased handgrip myogenic response.

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Objective: To investigate the acute effect of whole-body vibration (WBV) on handgrip strength (HS) and electromyographic activity of the flexor digitorum superficialis muscle of healthy women in the static push-up position.

Methods: Twenty-eight women received four experimental tests in a randomized order: A) Control e rest in seating position with feet on the floor and hands in the supine position on the lower limbs. There was no vibration stimulus; B) Placebo e push-up position with their hands on the vibratory platform that remained disconnected, but with a sonorous stimulus mimicking the vibration; C) Low vibration and D) High vibration e push-up position with their hands on the vibratory platform using one of the vibratory stimulus intensity: low vibration: 25 Hz/2 mm/49.30 m s^{-2}; or high vibration: 45 Hz/2 mm/159.73 m s^{-2}. Participants remained 5 min in each situation. HS and electromyography (EMG) were performed at baseline and after all four experimental tests. The index of neural efficiency (i.e. the ratio between EMG and HS) was also calculated to determine the efficiency of muscle contraction. Statistical analysis was performed by ANOVA two-way design mixed test with Tukey's post hoc test, being considered significant $p < 0.05$.

Results: High vibration increased HS compared with all the other experimental tests ($p = 0.0006$, $F = 6.03$). There was a reduction of EMG activity of the flexor digitorum superficialis muscle only after high vibration ($p = 0.0135$, $F = 6.22$), which was accompanied by lower values of the index of neural efficiency after intervention (between-group difference, $p = 0.0002$, $F = 0.674$).

Conclusion: WBV in the push-up position has an acute positive effect on HS accompanied by a lower index of neural efficiency, providing a better efficiency of muscle contraction.