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POSSIBLE EFFECTS OF CRANIAL APPROACH ON THE BRAIN ACTIVITY.

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Background: Osteopathy in the Cranial Field (OCF) is a system of diagnosis and treatment originated from the intuition by Sutherland in 1939 (1). According to this a link between the occiput and sacrum was recognized (2;3;4). However, few studies investigated the cranium-sacrum relationship, showing inconsistent results about the simultaneity of palpatory findings at the two anatomical areas (5;6). OCF consists of a gentle hands-on manipulation on the cranial area and/or sacral area, aimed to normalise the areas of dysfunction (7). Despite some evidence showed OCF effects on several clinical conditions (8;9;10;11;12), the bio-physiological mechanism supporting OCF is still debated and remains mostly anecdotal (13). Compression of the fourth ventricle (CV4) is probably the most studied cranial technique. Clinical evidence attributed to CV4 effects on the nervous system functions. However, the evidence supporting the clinical benefits due to CV4 is still poor and its physiological mechanism is far from being uncovered (14). A preliminary study assumed that CV4 can affect the modulation of electrical activity in the brain by increasing the alpha-band power in the occipital area (15).

Objective: The aim of this study was twofold. First, we sought to confirm the results by Miana. Second, we measured the alpha-band activity during a sacral technique (ST), in order to analyse the potential neurophysiological connection between the occiput and sacrum during osteopathic cranial approach.

Methods: This study was a randomised cross-over trial in which 40 subjects received a combination of active techniques (CV4 or ST) and the related sham techniques (sCV4 or sST), organised in two separated experimental sessions. We enrolled healthy men and women aged between 20 and 30 years. Quantitative EEG was used to measure changes in the alpha-bands power during rest, the (active and sham) techniques and post-technique. The analysis was carried out by using a repeated measures ANOVA in the linear general model framework consisting in a within-subjects factor (time, ie pre-, during and post-recording) and a within-subjects factor (treatment, ie CV4 or ST).

Results: The time x treatment interaction effect results statistically significant ($F=791.4$; $p<0.001$). CV4 increases the level of the alpha-band power at the occipital area compared to the levels measured during rest. Both CV4 and sCV4 showed a statistically significant increase of the alpha-band power levels during techniques compared to the rest. The significant effect of CV4 with respect to sCV4 was registered during the post-intervention phase. During TS and sTS, no statistically significant differences were registered with respect to the rest.

Conclusion: The results of this study were aligned to the results of previous studies, thus confirming the CV4 effects on the alpha-band activity. This neurophysiological response was not observed after ST, suggesting that the connection between the occiput and sacrum can not be explained by changes in alpha-band.

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