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Type of research	Original papers
Title of Abstract	The use of HRV and skin conductance to value the effect of CV4 and Rib Raising Techniques on the autonomic balance
Text of ABSTRACT	

Introduction. Osteopathic medicine teaches that cranial manipulative techniques modify the rate of the cranial rhythmic impulse (CRI) and as a consequence positively influence body physiologic. The mechanisms of their function, however, are only partially elucidate. The two most relevant techniques are the fourth ventricle (CV4) and the Rib raising technique. Both are likely to act influencing the autonomic nervous system. In particular the CV4 technique increases the para-sympathetic tone while the Rib raising technique, increases the sympathetic nervous system activity immediately after its application. No final demonstration of these effects are available in the literature. The aim of this study was to verify whether the CV4 and Rib Raising Techniques influence in health adult subjects the autonomic system activity evaluated on the base of the heart rate variability (HRV) and of the skin conductance.

Methods. To this aim we unrolled 40 healthy adult subjects from the Clinic of Osteophaty, ASP n° 9, Mazara del Vallo, Trapani, Italy, since June 2010 to January 2011. Inclusion criteria were an age between 18 and 65 years and the healthy state. In particular we excluded obese subjects, subjects under pharmacologic therapies and/or effected by skin and cardiovascular disease, any psychiatric disorder or with an history positive for a traumatic cranial event. The subjects were subdivided in three groups: the CV4 group, the Rib Rising group and sham group. HRV was evaluated measuring the ratio between LF and HF. HRV and Skin Conductance were registered in real time during the treatment and three time point were analysed: T0: base line; T1: during the technique; T2: post-technique.

Results. Only subjects in the CV4 group showed an increase in the LF/HF rapport at T1 in respect to T0 ($p<0.001$). The two techniques (CV4 and Rib Raising) decrease LF/HF at time T2, in respect of T0 ($p<0.05$). Subjects in the CV4 displayed a significant reduction of the LF/HF at T2 in respect to the subjects in the sham group. No variations in the conductance

were detected in any group or at any analyzed time point. Comparing the groups we observed that subjects in the CV4 group displayed a significant reduction of conductance at T1 in respect to Rib Rising subjects and at T2 in respect to sham group patients.

Conclusion. The results show that CV4 technique increases activity of sympathetic system during the procedure, while after technique there is an increase of parasympathetic activity. Rib Raising has the same effect on autonomic nervous system. However, during the procedure, rib raising has a low effect on sympathetic system. The conductance decrease after the CV4 technique and during this technique decreases with major effect respect the rib raising technique. This results may indicate activation of parasympathetic nervous system.

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