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Effects of the transcranial direct current stimulation on prevention of postoperative cognitive dysfunction after cardiac surgery

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Introduction: Postoperative cognitive dysfunction (POCD) is a contrary event observed between 20 to 83%, especially in elderly and after cardiac surgery. Prevention and rehabilitation on cases of POCD may improve the quality of life. The neuromodulator effect of the noninvasive cerebral stimulation has been used in the treatment of brain injuries, depression, and also in the cognitive rehabilitation. The hypothesis is that the use of the transcranial direct current stimulation (tDCS) technique can decrease the occurrence of POCD and cognitively rehabilitate patients submitted to cardiac surgeries.

Aim: The objective of this study is to evaluate the tDCS effect over the occurrence of POCD in patients on cardiac surgeries.

Methods & Results: After approval from the Institutional Ethics Committee, 138 adults were included in the study after a cardiac surgery. Patients were randomly allocated in two groups, tDCS Group: Submitted to 2 daily sessions of cerebral stimulation, starting from the first day after surgery during 4 consecutive days, with each session having 20 minutes. They were given a direct current stimulus of 2 mA in the right anode and in the left cathode on the prefrontal right region. SHAM Group: The same equipment used in tDCS as simulated stimulus similar to the active one. They were underwent neuropsychological tests to evaluate memory, attention, and executive functions as well as data relative of surgery, cognitive evolution and quality of life in postoperative period. The neuropsychological test provided the moments of application, with mean and standard deviation (SD) and compared to results of normative tables with Z-score (± 1.96). The data were expressed in means, medians, confidence intervals (CI-95%) and SD and were analyzed by generalized estimating equation (GEE), to comparison of the results between the two groups and $P < 0.05$ was considered significant.

Biography

Livia Stocco Sanches Valentin has completed her PhD from University of São Paulo School of Medicine-FMUSP and Post-doctoral studies from Harvard Medical School; David Geffen School of Medicine at UCLA; Cleveland Clinic Lerner College of Medicine of Case Western University; University of Copenhagen; Utrecht University; Max Planck Institute and Karolinska Institute as a multicenter study. She is the Principal Investigator of the RCT Evaluation of POCD through the MentalPlus® digital game. She has published papers in Anesthesia and Neuropsychology journals and has been serving as an Editorial Board Member of many journals and Reviewer of journal about Anesthesiology and Neuroscience.

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