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Emdr Therapy Changes the Resting-state Eeg

G. Di Lorenzo¹, L. Monaco¹, A. Daverio¹, E. Santarnecchi², A.R. Verrdo³, C. Niolu¹, I. Fernandez³, M. Pagani⁴, A. Siracusano¹

¹Department of Systems Medicine, University of Rome "Tor Vergata", Rome, Italy ; ²Department of Medicine Surgery and Neuroscience, University of Siena, Siena, Italy ; ³EMDR Italy Association, Bovisio Masciago, MB, Italy ; ⁴Institute of Cognitive Sciences and Technologies, CNR, Rome, Italy

Introduction: During the Eye Movement Desensitization and Reprocessing (EMDR) changes of brain electrical activity was recently demonstrated in victims of psychological traumas.

Objectives: Thirty-one victims of psychological traumas were investigated at the first EMDR session (t0) and at the last one performed after processing the index trauma (t1).

Aims: To investigate differences in EEG source activity and EEG source functional connectivity (EEG-SFC) in eyes closed condition before the beginning of t0 and t1 EMDR therapy session.

Methods: Electrical source activity was computed by eLORETA from a 37-channel EEG. EEG-SFC analysis was based on the lagged phase synchronization (LPS), derived by a two-step eLORETA procedure: dimensionality reduction of inverse matrix from 6239 voxels to 28 regions of interest (ROIs); LPS indices computation, for each spectrum band, in all possible ROI pairs.

Results: Resting-state EEG source activity resulted in a low frequency increase of posterior cingulate cortex and a high frequency (beta2 and gamma) decrease in right prefrontal and parietal cortex between t0 and t1. Significant enhancements of EEG-SFC were detected in t1 respect to t0 between ROI pairs of theta band right temporo-parahippocampal regions and alpha band fronto-parietal regions.

Conclusions: Significant modifications of resting-state electrical brain activity were present after EMDR therapy. These findings suggest that the elaboration of psychological traumas induced by EMDR produces, in a resting-state condition, an enhancement of activity and functional connectivity of cerebral sources involved in cognitive control and emotional processing.