OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference and Exhibition on
Neurology & Therapeutics
June 17-19, 2013 Hilton Chicago/Northbrook, Chicago, USA

Noninvasive localization of epileptogenic zone. Improving accuracy of EEG source analysis

Cuspineda Bravo E. R[1], Martínez-Montes E[2], Farach Fumero M[1] and Machado Curbelo C[1]
[1]Havana Institute of Neurology and Neurosurgery, Cuba
[2]Cuban Neuroscience Center, Cuba

Recent developed methods for EEG source analysis can provide non-invasive functional neuroimages for accurate localization of the epileptogenic zone. A number of Inverse Solution (IS) methodologies have been proposed to solve this problem, and their advantages and limitations have been described. In the present work a previously developed IS approach called Bayesian Model Averaging (BMA) is introduced in clinical practice in order to improve the localization accuracy of epileptic discharge sources.

Methods: For this study, 31 patients with diagnosis of partial epilepsies were studied: 14 suffered from benign childhood epilepsy with centrotemporal spikes and 17 from temporal lobe epilepsy. The underlying epileptic sources were localized using the BMA approach and results were compared with those expected from the clinical diagnosis. Additional comparisons with results obtained using three of the most commonly used distributed IS methods for these purpose (Minimum Norm (MN), Weighted Minimum Norm (WMN) and LORETA) were carried out in terms of source localization accuracy and spatial resolutions.

Results: The BMA approach estimated discharge sources that were consistent with the clinical diagnosis, and this method outperformed LORETA, MN and WMN in terms of both localization accuracy and spatial resolution. BMA was able to localize deeper generators with high accuracy.

Conclusion: The BMA methodology has a great potential for the non-invasive accurate localization of epileptic sources, even those located in deeper structures. Therefore, it could be a promising tool for clinical practice in epileptology.

Biography

Elena R. Cuspineda Bravo M.D., M.Sc., is a Professor at Havana Institute of Neurology and Neurosurgery, Cuba. She has done her academic studies of Medical Doctor from Higher Medical Sciences Institute, Havana City, Cuba, 1991, specialist in Clinical Neurophysiology, 2001 and M.Sc. in Neurosciences, Cognitive Neurosciences, 2007. Her current position is Medical Specialist in Clinical Neurophysiology, Head of the EEG Lab, Institute of Neurology and Neurosurgery, Havana City, Cuba and Head of the Sleep Disorder Lab. She has published 11 scientific papers and 8 abstracts in reputed journals. She has presented more than 20 works in International Congress. She is editorial board member of the World Journal of Neurology (WJN).

elena.cuspineda@infomed.sld.cu