

Fluctuations of Responsiveness in Minimally Conscious State patients: an EEG and ECG study

Wednesday, September 25, 2024 2:10 PM (20 minutes)

Minimally Conscious State (MCS) is a Disorders of Consciousness (DoC) characterized by inconsistent signs of consciousness and fluctuations of responsiveness.

The objective of this study was to investigate the relationship between electroencephalographic (EEG) and electrocardiographic (ECG) indicis and responsiveness in MCS patients.

We involved 15 MCS patients in a multimodal (EEG and ECG) resting-state monitoring, divided into 2 two-hours sessions (morning/afternoon). During the monitoring an auditory oddball paradigm was presented (5 times in each session) and we defined the presence of a Windows of Responsiveness (WoR) based on the variability of amplitude and latency of the P300 component of the Event-Related Potential in response to the oddball task. We defined a WoR as a moment of higher responsiveness with respect to a NoWoR (i.e., a moment of lower responsiveness).

We found a significant difference between WoR and NoWoR in Heart Rate (HR, $Z=2.21$, $p<.05$), Hearth Rate Variability (HRV, $Z=2.30$, $p<.05$) and Power Ratio Index (PRI, $Z=2.93$, $p<.05$) and a significant correlation between PRI and both HR ($R=-0.26$, $p<.05$) and HRV ($R=0.32$, $p<.05$).

According to these results, we demonstrated that HR, HRV and PRI could be suitable indices of responsiveness. These results will contribute to characterizing WoR from a neurophysiological perspective and in identifying the best moment to interact with patients, also with the support of a passive Brain-Computer Interface (i.e., a device automatically detecting covert cognitive and emotional states by recording users spontaneous brain activity without requiring any secondary tasks).

If you're submitting a poster, would you be interested in giving a blitz talk?

No

If you're submitting a symposium talk, what's the symposium title?

If you're submitting a symposium, or a talk that is part of a symposium, is this a junior symposium?

Primary author: GALIOTTA, Valentina (Fondazione Santa Lucia IRCCS, Università Sapienza di Roma)

Co-authors: Dr MATTIA, Donatella (Fondazione Santa Lucia IRCCS); Ms CAPONERA, Elisa (Università degli Studi di Padova); Dr QUATTROCIOCCI, Ilaria (Fondazione Santa Lucia IRCCS, Università Sapienza di Roma); Prof. TOPPI, Jlenia (Fondazione Santa Lucia IRCCS, Università Sapienza di Roma); Dr D'IPPOLITO, Mariagrazia (Fondazione Santa Lucia IRCCS); Dr FORMISANO, Rita (Fondazione Santa Lucia IRCCS); Prof. SDOIA, Stefano (Università Sapienza di Roma); Dr CARACCI, Valentina (Fondazione Santa Lucia IRCCS, Università Sapienza di Roma); Dr RICCIO, Angela (Fondazione Santa Lucia IRCCS)

Presenter: GALIOTTA, Valentina (Fondazione Santa Lucia IRCCS, Università Sapienza di Roma)

Session Classification: Lunch & Poster 3