

Raw EEG characteristics during a case of propofol induced myoclonic movements

Barbara Wyler¹, Jurgen Van Limmen, MD², Mathieu Jospin³, Kristl Vonck, MD, PhD⁴, Hugo Vereecke, MD, PhD²

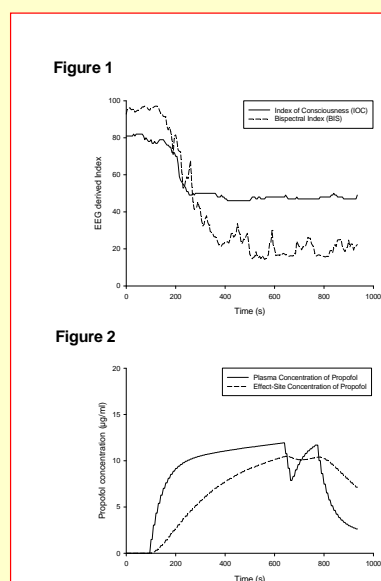
¹Fact. of Anaesthesia, Ghent University, Gent, Belgium ²Dept. of Anaesthesia, Ghent University Hospital, Gent, Belgium

³Biomedical Engineering Research Centre, Technical University of Catalonia, Barcelona, Spain ⁴Dept. of Neurology, Ghent University, Gent, Belgium

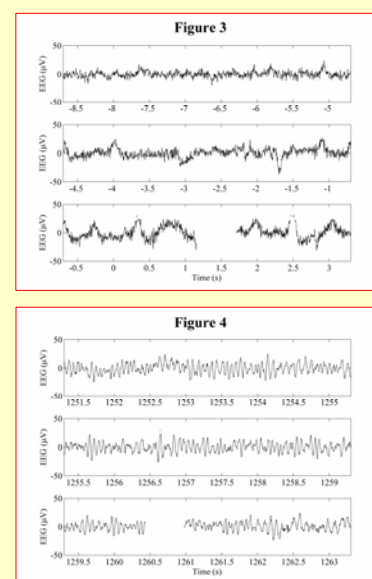
Introduction: In rare occasions, myoclonic movements can be observed during a propofol induction.[1,2] It remains unclear whether this has either a muscular or cerebral origin. We describe a case of a patient who had bilateral tonic-clonic arm and leg movements during propofol induction, while being monitored by the Index of Consciousness (IoC) monitor.(Morpheus, Barcelona, Spain)



Methods and materials: We had approval of the institutional Ethics Committee (Ghent University Hospital, Belgium), and written informed consent. We administered propofol 1% at 300 ml/h to a female patient, weight 77kg, length 161cm, age 24y. (Figure 2) IoC was monitored at the left side of the brain. (Figure 1) The IoC monitor transmits data to a computer running Rugloop software (Demed, Temse, Belgium). The single channel, frontally obtained, EEG data is transmitted with a sampling frequency of 1024 Hz and a resolution of 16 bits within a +/- 475 μ V interval. The differential amplifier of the IoC-monitor has a high Common Mode Rejection ratio (CMRR>130 dB) in order to reduce interference. Artefacts as defined by the monitor were rejected. The artefact free EEG wave was printed and evaluated by an epilepsy expert (Prof. Dr. Vonck, Ghent University, Dept. of Neurology) in order to evaluate whether this EEG wave contained any signs of epileptic activity.



Results: Throughout the case, moderate levels of EMG activity were detected by the IoC monitor without negative effects on the signal quality index. We extracted 22.5 min of artefact free EEG data that was interpreted by visual inspection as “low voltage activity with mainly β -activity at 12-14 Hz and very slow θ - δ activity after 8 minutes of EEG recording. (Figure 3) The latter reflects propofol induced hypnosis. After 18 minutes, normal sleep spindles were observed. (Figure 3) No epileptiform discharges were visually detected by the expert.



Discussion: Ideally, a multichannel EEG combined with a time synchronized EMG registration is mandatory to study the origin of abnormal motor responses evoked by propofol. Due to the rare incidence of this observation such a measurement has not yet been performed. Casuistic reports remain the only source of information.

Conclusion: Although not scientifically conclusive, our observation supports the hypothesis that propofol evoked myoclonic activity is more likely to have a muscular instead of a cerebral origin.

References:

1. Walder B. et al, *Neurology*, 2002; 58:1327-32
2. Hickey K.S. et al., *The Journal of Emergency Medicine*, 2005; 29(4):447-449