SYMPOSIUM : FACTORS INFLUENCING NEUROFEEDBACK EFFICIENCY

Organizers

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Short description

The Neurofeedback training (NFT) technologies pursue the goal – the voluntary modification of the neurophysiological process affecting the cognitive and psychomotor activity. Therefore, an analysis of the literature regarding NFT can be beneficial for a deeper understanding of the training process itself and the factors that affect the clinical effectiveness of neurofeedback control.
Meanwhile, the NFT technology used to modify behavior, cognitive and affective functions in healthy people (to reach a “peak form”) and in the rehabilitation of patients with a wide range of psychosomatic disorders often does not achieve sufficient efficiency. In particular, NFT that ignores the individual variability of EEG indices can reduce the effectiveness of learning (Kaiser, 2001; Arns et al., 2008; Bazanova et al., 2010, 2017, 2018). More importantly, in the case of NFT for the rehabilitation of attention deficit disorder, the use of non-individually defined theta and beta ranges as a feedback signal leads to a deterioration in the patient's condition (Kaiser, 2001; Bazanova and Aftanas, 2007, 2010; Bazanova et al., 2009, 2018).

Also, the limited efficiency of NFT may be due to the neglect of psychophysiological significance, coherence, and just a “noise” of the EEG by the low-amplitude components of the electromyographic signal (EMG) (Cacciopo et al., 1998; Goncharova et al., 2003, Hashimoto et al., 2010). Neurofeedback works as a closed-loop system that provides real-time information regarding the participant's brain activity depended on the current neurohormonal state. Hormones can modulate the use of self-learning strategies and efficiency of NFT (Sundström Poromaa and Gingnell, 2014; Bazanova et al., 2016).
In spite, NFT follows the principle of operant conditioning, through reinforcing specific behavior with rewards; this method of learning occurs through conscious training of self-awareness of optimal functioning.
So, NFT efficiency depends on the choice of personal psychophysiological strategies to achieve optimal functioning (Bazanova et al., 2012).

Objectives and Outline

To demonstrate the fundamental and practical significance of an individualized personal oriented approach to creating the NFT paradigm, this talk will present literature data and the results of own studies of comparing the NFT efficiency, organized by standard and individualized NFT protocol with individually determined frequency ranges, undertaking into account EMG and neurohormonal state, and using the particular self-chosen psychophysiological strategy to achieve optimal functioning.

Keywords

neurofeedback, individualized EEG analysis, frontal muscles EMG, neurohormonal condition, personal psychophysiological strategy