
The study of the neurophysiologic mechanisms of perception of emotionally significant information in patients in coma, healthy adults and children.

Galina Portnova*^{2,1}

²IHNA RAS – IHNA RAS – France

¹Neurophysiology – Russia

Abstract

This study investigates the problem of finding indicators of brain activity in patients with depression of consciousness and to identify predictors of the dynamics of their condition. It is suggested that, despite the absence of any behavioral activity, patients can be diagnosed with some brain activity, distinct from the brain activity of healthy adults. The level of preservation of cognitive function can be determined by measuring the response of the brain rhythms to emotionally significant stimuli in different modalities. Such a response has prognostic value and can be used as effective rehabilitation procedure. Stimulation consists of: auditory stimuli (physiological (cough, vomiting), emotional (laughing, crying), nature sounds (bird song), human speech, household sounds, neutral sounds (white noise). As a tactile stimulation we used pleasant stimuli (soft brush), unpleasant (prickly brush) and writing on the hand of different words. EEG was recorded using portable device "Entsefalan" with polygraph channels (POLY-4), power of rhythmic activity was assessed by presenting the different groups of stimuli, changes in vegetative characteristics and the ERP. Patients in a coma had only a reaction to an emotionally significant stimulation: we observed significant differences in Delta- and beta- oscillations during presentation of this kind of stimuli. We varied emotional and cognitive components of stimulation and found that, electrical response disappeared when stimuli became less emotionally important and more cognitively difficult. In addition, the change in the power of rhythmic brain activity in patients was closer to a change in rhythmic activity in children than adults.

*Speaker