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REACTIVITY INDICES OF SENSORIMOTOR RHYTHM IN CONNECTION WITH ALEXITHYMIC PERSONALITY TRAITS

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During the last decade, following the high popularity of studies related to the system of mirror neurons, there is a growing interest in the theory of sensorimotor resonance as the low-level neural mechanism underlying social perception and behavior. The EEG mu-rhythm is often considered as a marker of sensorimotor resonance. The characteristics of its reactivity are being studied mostly in connection with the questions of deficits in various social abilities (e.g., empathy) and autistic spectrum disorders. Still there are lacking publications aimed at studying a possible relationship between the properties of the mu-rhythm functional dynamics and persistency of alexithymic personality traits, with the central one being characterized by a significantly decreased ability to identify emotions in the self and others. In our work, we present the results of the analysis of

statistical relationships and differences between the scores on the alexithymia questionnaire (TAS-20) and the background (wakeful rest) and reactivity characteristics of the sensorimotor mu-rhythm in the frequency ranges of alpha (8–13 Hz) and beta1 rhythms (14–20 Hz). Of the initial sample of 74 people, there were selected for further analysis 53 subjects (18 men, 35 women) who had a relatively stable mu-rhythm (8–13 Hz) depression reaction in the C3 lead (contralateral to the moving hand) when performing self-paced hand movements with a computer mouse relative to the amplitude of the mu-rhythm during wakeful rest with open eyes (background condition). We have found significant negative correlations between the integral score on alexithymia (TAS-20) and the amplitude of the background EEG in loci C₃, C₄ and C_z in the frequency range of beta1-rhythm (14–20 Hz). Among the three scales measured in TAS-20 only the scale "Difficulty Identifying Feeling" showed similar relationships. Besides, this scale negatively correlated (to a lesser extent) with the background amplitude of alpha-rhythm in C_z and with the relative depression of alpha-rhythm in C₄ when observing hand movements with a computer mouse performed by other people. Analysis of the intergroup differences among the samples with low, medium and high scores of the overall anxiety level allowed us to conclude that there are significant or close to significant differences in the background amplitude and reactivity indices of the sensorimotor rhythm exclusively in the frequency range of beta1-rhythm. Of note is that these differences are predominantly constituted by the sample with high overall alexithymia score. The samples with low and medium scores on alexithymia don't seem to differ on the measured values. Individuals showing high alexithymia level can be characterized as having lower background amplitude and weaker reactivity of the sensorimotor beta1-rhythm under three central leads C₃, C₄ and C_z when observing movements performed by other people and under C₃ when performing movements by themselves.

Keywords: electroencephalogram, sensorimotor rhythm, mu-rhythm, beta-rhythm, alexithymia, TAS-20.

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