

Disturbances of binding phenomenon in schizophrenia

Results:

The project was aimed at the study of the “binding” phenomenon – exact temporal synchronization of the high frequency EEG activity (20-40 Hz) and its disturbances in schizophrenic patients. 100 sec EEG traces were recorded and subsequent analysis of selected 50 sec fragments free from artifacts was done using the brain mapper.

The connectivity study was performed using coherence and typical connections methods, the latter being elaborated in our laboratory and enabling the detection of the exact frequency at which the connections were established.

The results obtained by the coherence method showed that during the cognitive task on visual imagination in the normal controls there were 8 interhemispheric connections while in both groups of patients – with the predominance of positive as well as with negative symptoms interhemispheric connections were absent. The results obtained by the “typical connections” method revealed that in the normal controls during the task performance interhemispheric connections were established at the frequency 38 Hz, coinciding with the other authors’ data on binding phenomenon. In patients with positive symptoms there were no interhemispheric connections; in patients with negative symptoms there was a set of connections established at the lower frequency – 29 Hz, which we considered as pathological compensation leading to the irreversibility of the symptoms.

Thus we revealed the phenomenon of functional hemispheric disconnection in patients at the high frequency EEG activity during the cognitive task, this phenomenon being the part of Gestalt principle and functional clustering disturbances schizophrenia.

Published work:

V.B. Strelets, V.Y. Novototsky-Vlasov, J.V. Golikova. *"Cortical connectivity in high frequency beta-rhythm in schizophrenics with positive and negative symptoms"*. International Journal of Psychophysiology, 2002, 44, 101-115.

V.B. Strelets, V.Yu. Novototsky-Vlasov, Zh. V. Garakh, V.A. Zeligovsky, A.Ya. Kaplan. *"The multipleparameter Combinatory Analysis of EEG Rhythms in Norm and at Schizophrenia"* // J.V.N.D., 2007, V. 57, №6, pp. 699 - 706.

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