

Psychophysiological Mechanisms of some aspects of Neurocognitive Deficit in Schizophrenic Patients

Results:

Discovery of the role of induced high frequency EEG activity in “binding phenomenon” that possibly underlies higher nervous functions (Tallon-Badry et al., 1996; Bennet, 1997) calls for the need to study this phenomenon in schizophrenia which is the disease including the failure of the integration between different brain areas.

We studied 50 free of medication patients diagnosed by DSM-IY and divided by SANS and SAPS almost equally to those having predominantly either positive or negative symptoms. The matched group of 30 healthy subjects was also studied; all participants gave informed consent for the experiment. We studied the spectral power of EEG-rhythms and the coherence between different brain areas in the background and during the performance of the tasks: mental arithmetic, space imagination and silent counting the hours on imaginary clock dial.

In the controls most brain rhythms were symmetrical and there were many intra- and interhemispheric connections especially during the tasks performance. In both groups of patients in gamma-rhythm opposite to the norm, interhemispheric connections were absent. This disruption of interhemispheric informational transmission in schizophrenia can be caused by corpus callosum malfunction (Downhill, Buchsbaum, 2000) or synaptic defect.

Chronic schizophrenics with positive symptoms also revealed shortened EEG microstate duration which was obtained in the study together with D. Lehmann, T. Koenig, L. Gianotti and J. Gruzelier. These data show that information processing in some classes of mental operations terminate prematurely.

Functional disconnection of hemispheres and shortened microstates could underlie some aspects of neurocognitive deficit in schizophrenic patients.

Published work:

V. Strelets, P. Faber, J. Golikova, V. Novototsky-Vlasov, T. Koenig, L. Gianotti, J. Gruzelier, D. Lehmann

“Chronic schizophrenics with positive symptomatology have shortened EEG microstate durations.”

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Magomedov, R. A., Garakh, Z. H., Orekhov, Iu. V., Zaitseva, Iu. S., & Strelets, V. (2010). Gamma-rhythm, positive, negative symptoms and cognitive dysfunction in schizophrenia [in Russian]. *Zh Nevrol Psichiatr Im S S Korsakova*, 110(1), 78-83.

Medkour, T., Walden, A. T., Burgess, A., & Strelets, V. (2010). Brain connectivity in positive and negative syndrome schizophrenia. *Neuroscience*, 169(4), 1779-1788. doi: 10.1016/j.neuroscience.2010.05.060

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