

EPV0636

Short-term olfactory deprivation reorganizes brain activityS. Tukaiev^{1,2*}, I. Zyma² and M. Makarchuk²¹Faculty of Communication, Culture, and Society, Institute of Public Health, Università della Svizzera italiana, Lugano, Switzerland and²Institute of Biology and Medicine, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine

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Introduction: Olfactory loss (including short-term) initiates neural reorganization processes in the brain, but the central mechanisms of this largely remain unknown.

Objectives: We aim to conduct a neurophysiological study of neocortical mechanisms for the effects of olfactory sensation on functional activity of human brain under temporary obstruction of nasal breathing.

Methods: 123 healthy volunteers (76 female and 47 male students aged 18 to 23 years) participated in this study. EEG was registered during the rest state (5 min), olfactory blockage (5 min), under odor stimulation with the lemon essential oil (5 min) and renewal of nasal breathing (5 min). We estimated the spectral power density and the levels of coherence of all the frequencies from 0.2 to 35 Hz.

Results: The onset of orthonasal olfactory sensory blockage was accompanied by an increase in the power of processes of local synchronization of beta frequency in the caudal regions of the brain, with simultaneous enhancement of the coherence of the theta band in parietal-occipital zones and a certain enhancement of the interfrontal and intrahemispherical left-side and right-side interactions in the beta2-subband. Thus, the sudden cessation of olfactory detection led to activation of thalamo-cortical loops and top-down control systems (search for the olfactory signal): that is an active orienting process (triangle of increase in F4-T4-P4 connections) with emotional coloring (the caudal localization of the coherence changes in the theta band). The prolongation of the nasal blockage, despite the possibility of activation of the retronasal route of odor perception and odorized air, was accompanied by a definite inhibition of distant interactions in the posterior regions of the brain in the theta-band and a significant decrease in right-brain long-distant and parietooccipital beta2-subband functional connectivity. Restoration of nasal breathing and olfactory perception is accompanied by sufficiently powerful activation of interhemispheric long and short distance information interactions in the theta_{1,2} and beta₁ frequency bands.

Conclusions: Our data indicated that cessation and restoration of olfactory perception lead to an increase cognitive activity, the development of memory processes, the current sensory and cognitive-emotional control of behavioral reactions, focusing attention, assessment of the significant stimulus.

Disclosure of Interest: None Declared

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Neuropsychiatric manifestations inaugurating Biermer's disease

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Introduction: Vitamin B12 deficiency gives rise to a wide spectrum of hematological, gastrointestinal, psychiatric, and neurological disorders. Notable among the neuropsychiatric symptoms are mood disturbances, cognitive decline, and psychotic manifestations.

Objectives: We present a case of a woman with neuropsychiatric symptoms linked to vitamin B12 deficiency to highlight certain organic aetiologies with psychiatric symptoms in the foreground.

Methods: We discussed through a clinical case and a literature review, the relationship between neuropsychiatric symptoms and vitamin B12 deficiency in the context of Biermer's disease.

Results: We presented a patient aged 51-years-old without neurological or psychiatric history, she was hospitalised in a psychiatry department for behavioral disturbances, hetero-aggression, and incoherent speech. The psychiatric examination revealed distant contact, inappropriate affects, disorganized speech with persecutory delusions, memory problems, and poor insight. Neurological et physical examinations were normal, and cerebral magnetic resonance imaging (MRI) showed no abnormalities. First, haloperidol 25mg was prescribed, however, there was only partial improvement. Complete blood counts revealed macrocytic anemia (Hemoglobin: 8 g/dL, mean corpuscular volume: 106 fL). Her serum B12 assay was 48.19 pmol/L. Given these results we proceed to a Fundic biopsy, performed by fibroscopy, that revealed fundic atrophy and intestinal metaplasia compatible with Biermer's disease. Vitamin B12 replacement therapy began with hydroxocobalamin at 1000 µg/day intramuscularly for 15 days, followed by 1000 µg every 15 days for one month. Subsequently, there was a remarkable improvement in psychotic symptoms and cognitive function. Follow-up assessments demonstrated a return to baseline functioning.

Conclusions: This case, coupled with prior studies, emphasizes the importance of considering vitamin B12 deficiency in the differential diagnosis of neuropsychiatric symptoms. Therefore, prompt diagnosis and treatment of vitamin B12 deficiency are imperative in preventing potential irreversible neurological damage.

Disclosure of Interest: None Declared

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Exploring the Potential of Cannabinoids in the Treatment of Tourette's Syndrome

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