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ABSTRACT BOOK

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We have prepared this case report to share our results and conclusions on this topic. The VEPs recording procedure was performed according to the recommendations of the International Society for Clinical Electrophysiology of Vision (ISCEV). VEP-ERGs were recorded with MP150 Manager Version 3.7.3 software (Biopac Systems, Inc., Santa Barbara, USA). N_2 and P_2 latencies (millisecond), N_2-P_2 (microvolt) amplitudes were evaluated. The patients were sent to our laboratory after their emergency aids had been done. VEP-ERG of the patients were recorded immediately after methyl alcohol exposure. Both cases were called back for their second VEP-ERG recordings after 3 months later.

The latencies were longer and amplitudes were lower than normal in both eyes in VEPs of first patient. Both eyes of amplitudes were low in ERG. In second patient, P_2 wave was a bit longer and other parameters were normal in VEPs. Both eyes of amplitudes were low in ERG. 3 moths after methyl alcohol exposure, the P_2 wave was longer and other parameters were normal in VEPs of first patient. Right eye were normal and the latencies were low in ERG. In second patient, P_2 wave of VEPs was a bit longer and the other parameters were normal. Both eyes of amplitudes were low in ERG. Methyl alcohol exposure affected VEP-ERG pathogically but not specifically. It has been shown that degree optic neuropathy in methyl alcohol toxicity correlates with the abnormal electro physiologic changing. Methyl alcohol damages the other parts of the brain with visual neuronal system such as basal ganglia. All these could impair VEP-ERG. More studies which have wide number of cases with standardized methods are needed for exact foresights and data about methyl alcohol exposure.

Key words: Methyl alcohol toxicity, ERG, VEP

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The effects of NMDA receptor antagonist memantine on learning during the "kindling" procedure

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Hippocampal kindling is a well defined epilepsy model but there are few studies showing the changes in learning parameters accompanying neuroplastic changes in hippocampus of kindled rats. None of these studies considered the time period to be kindled. In our study we aimed to observe the effects of non-selective NMDA antagonist memantine on water maze learning parameters in early kindling time period.

40 male Wistar rats were taken to the study in 5 groups (8 in each group: Control, sham, memantine, kindling, kindling+memantine). We used modified water maze learning model for the learning procedure. Memantine has been applied intraperitoneally as follow: 20 mg/kg for once and then 2x1 1mg/kg/day for 7 days. Control, sham and memantine groups' data have been obtained. Experiments are going on and "Kindling" and "kindling"+memantine groups are being prepared for water maze learning procedure.

Our first findings has shown that memantine has a positive effect on water maze learning parameters. Escape latencies and path length are both slower in memantine group than in control and sham groups.

We emphasize though memantine is a non-selective NMDA receptor antagonist, its' non-selective properties might be the reason for the modulating effects on learning. In the next stages of our study we hope to strength our hypothesis with new findings of memantine effects during early "kindling" procedure.

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Interactions between the theta and gamma oscillations in human EEG

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Human subjects typically keep about seven items (plus or minus two) in short-term memory (STM). A theoretical neuronal model has been proposed to explain this phenomenon with physiological parameters of brain oscillations in the gamma and theta frequency range, i.e. roughly 30-80 and 4-8 Hz, respectively. In that model, STM capacity equals the number of gamma cycles (e.g. 25 ms for 40 Hz), which fit into one theta cycle (e.g. 166 ms for 6 Hz). The model is based on two assumptions: 1) theta activity should modulate gamma activity and 2) the theta/gamma ratio should correlate with human STM capacity. The first assumption is supported by electrophysiological data showing that the amplitude of gamma oscillations is modulated by the phase of theta activity. However, so far this has only been demonstrated for intracranial recordings. We analyzed human event-related EEG oscillations recorded in a memory experiment in which 13 subjects perceived known and unknown visual stimuli. The paradigm revealed event-related oscillations in the gamma range, which depended significantly on the phase of simultaneous theta activity. Our data are the first scalp-recorded human EEG recordings revealing a relationship between the gamma amplitude and the phase of theta oscillations, supporting the first assumption of the abovementioned theory. Interestingly, the involved frequencies revealed a 7:1 ratio. However, this ratio does not necessarily determine human STM capacity. Since such a correlation was not explicitly tested in our study, our data is not conclusive about the second assumption. Instead of theta phase modulating gamma amplitude, it is also conceivable that focal gamma activity needs to be downsampled to theta activity, before it can interact with more distant brain regions.

Key words: EEG, oscillations, theta, gamma, memory

P78

The effect of fluoxetine on behavioral despair and BDNF expression in the limbic system of rats in an animal model of depression precipitated by stress

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Brain-derived neurotrophic factor (BDNF) is implicated in depression. Antidepressants, increase monoamine neurotransmitters in the synaptic cleft, and are reported to increase BDNF levels in rat brain. The aim of the present study was to assess the effects of fluoxetine (FLX) in a rat model of depression precipitated by chronic stress. Adult male Sprague Dawley rats were used. Restraint stress was applied in glass cylinders, 60 min/day for 30 days. Drug treatment (5mg/kg/day FLX or 1 ml/kg Saline) began on the 8th day of stress and continued for 23 days. During the last 2 days of treatment, stress was discontinued; rats were tested in the Porsolt Forced Swim Test (FST). BDNF expression was measured by immunocytochemistry in the amygdala and prefrontal cortex. Data were evaluated by multifactorial ANOVAs and t-tests.

In FST, FLX decreased freeze duration and increased swimming, thereby preventing despair, as expected. Stress elevated BDNF expression in both regions ($p<0.05$) in saline treated animals. FLX increased BDNF expression in rats not exposed to stress, but decreased expression in stressed animals. Overall, our results indicate that FLX has a positive effect in preventing behavioral despair precipitated by previous stress exposure. However, the clinical efficacy of FLX reported in depression may be independent of BDNF.

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Key words: Depression, Forced Swim Test, Fluoxetine, Brain-derived Neurotrophic Factor (BDNF), Amygdala, Prefrontal Cortex

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Effects of ketamin application at a sub-anesthetic dose for 5 days on emotional learning process

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