epileptic brain (Colom et al 2006). It is known that MS-DB includes three groups of interrelated neurons, which differ in neurochemical and electrophysiological properties: GABAergic, glutamatergic, and cholinergic cells. A part of GABAergic and glutamatergic neurons are endogenous burst pacemakers, though the pacemaker potential is less expressed in glutamatergic cells. Cholinergic neurons do no exhibit any pacemaker potential. The decrease in the number of inhibitory cells can lead to intraseptal changes, in particular, to the sprouting of cholinergic and glutamatergic axon collaterals, and consequently, an increase in the excitability of remaining neurons. In the analysis of electrophysiological parameters of MS-DB, special consideration should be given to burst activity, which is known to make an important contribution to the generation of the hippocampal theta rhythm. The data obtained showed the essential increase in the number of burst neurons in MS-DB of the epileptic brain (25.5% vs. 9.3% in control). This fact can be partly explained by that neurons possessing no endogenous pacemaker properties become involved into burst activity. Indeed, a quarter of burst neurons (putative cholinergic and/or glutamatergic neurons) completely stop firing under the blockade of synaptic transmission. However, the portion of pacemaker burst neurons also increased, probably due to the enhancement of the burst activity of glutamatergic neurons as a consequence of the weakening of tonic inhibitory influence. **CONCLUSION:** Essential changes in the basic parameters of spontaneous activity of MS-DB neurons in the epileptic brain were revealed for the first time. The data obtained can extend our understanding of the mechanisms of TLE and provide a basis for new ways of treatment of this disease. The work was supported by the Russian Foundation for Basic Research, grant 06-04-48637.

TENOTEN AMELIORATES MEMORY IMPAIRMENTS AND IMPROVE IMPULSIVE AND INADEQUATE BEHAVIOR OF IMMATURE RATS IN EXPERIMENTAL MODEL OF ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD). TA Voronina, AV Volkova, ES Zhavbert, IA Kheyfets, JL Dugina, SA Sergeeva, OI Epstein. NPF Materia Medica Holding, State Zakusov Institute of Pharmacology, Moscow, Russia

INTRODUCTION: ADHD is one of the most common neurobehavioral disorders of childhood; its prevalence is variably estimated to be between 4 and 10%. About 50 per cent of patients having ADHD keep its symptoms and signs in adulthood. Among clinical presentations of ADHD there is physical agitation, impulsive behavior and thought, inattention, inability to concentrate, talkativeness, distractibility etc. Currently used medications such as psychostimulants, tricyclic antidepressant, nootropics, anxiolytics have many registered side effects and should be subject to careful prescription. Taking into account the young age of the patients suffering from ADHD, the design and development of novel and safe drugs with the best benefit/risk ratio for the treatment of ADHD is an unmet medical need. The aim of the present work was to study the efficacy of tenoten, a novel anxiolytic proved effective in the treatment of anxiety disorders in adults, in rat “model” of ADHD in comparison with phenibut and evaluate memory-enhancing activity of tenoten in passive avoidance conditioned reflex (PACR) in comparison with piracetam. **METHODS:** 105 young (30-35 days old) hyperactive outbred male and female rats with impulsive and inadequate behavior were involved in the study of tenoten efficacy in ADHD “model”. The open-field test, Brady and Nauta scales were used to estimate the locomotory and exploratory activity and impulsive inadequate behavior of rats. The rats were divided into 3 groups: 1) tenoten (n=28; 2.5 ml/kg); 2) phenibut (n=20; 125 ml/kg) 3) distilled water (control; n=49; 2.5 ml/kg). Rats were given respective compounds once a day intragastrically for 7 days. The cognitive functions of rats were evaluated in PACR test (the entrance into dark chamber was punished by a series of 5 foot shocks (1s; .45 mA); the interval between shocks was 2 s). Emotional status and locomotory activity were estimated in the Elevated Plus Maze (EPM) test. A number of entries into the open and closed arms, a number of entries to the central square, time spent in the central square and in the open arms were registered. 112 young (30-35 days of age) outbred male and female rats were used in the study of tenoten and piracetam nootropic activity in PACR test. The rats were divided into 4 experimental groups: 1) intact animals (n=28); 2) tenoten (n=28; 2.5 ml/kg); 3) piracetam (n=28; 400 mg/kg in volume 2.5 ml/kg); 4) distilled water (control; n=28; 2.5 ml/kg). Rats were given respective compounds once a day intragastrically for 10 days. 56 of them were twice subcutaneously injected with scopolamine (1.4 ml/kg), and then tested in PACR test. The rest of the animals were involved in the suboptimal negative passive avoidance conditioned reflex test (PACR/sn). Rats received 8 punishing electrical shocks (1s; .6 mA) with 2 s interval in PACR test and 5 punishing electrical shocks (1s; .45 mA) with 2 s interval in PACR/sn. Nootropic effects of medications were assessed by the increase in the latency to enter the dark chamber. **RESULTS:** After 7-day treatment with tenoten or phenibut, the young hyperactive rats

showed 3-fold increase in the latency to enter the dark chamber. 40% rats of tenoten group and 20% of piracetam group did not enter the dark chamber. In EPM test, tenoten and phenibut caused 5.2- and 3.6-fold increase in a number of entries into the open arms respectively ($p<.05$), and 2- and 3.3-fold increase in a number of entries to the central square respectively ($p<.05$). Compared with tenoten, the anxiolytic activity of phenibut was more pronounced: phenibut showed a 2-fold increase in time spent in the central square and a 1.3-fold in time spent in the open arms ($p<.05$ vs tenoten). However, tenoten was significantly superior to phenibut in reducing the locomotory activity of hyperactive rats in EPM. In PACR test, as a result of scopolamine injection, the latency to enter the dark chamber in the control group decreased by 6.2 times ($p<.05$ vs intact group). On 10-day administration tenoten showed a memory-enhancing activity: the latency to enter the dark chamber was 4.3-fold higher than in control ($p<.05$). In piracetam group, the latency to enter the dark chamber was only a 3.3-fold higher ($p<.05$ vs control). In PACR/sn test, we confirmed nootropic activity of tenoten on 10-day administration: 2.5-fold increase in the latency to enter the dark chamber was registered in tenoten group ($p<.05$, vs control), 1.4-fold increase – in piracetam group ($p<.05$ vs control). **CONCLUSIONS:** Tenoten improved memory and impulsive and inadequate behavior of immature rats in experimental "model" of ADHD. Although anxiolytic activity of tenoten was slightly weaker than that of phenibut, nootropic and anti-amnesic effects of tenoten surpassed the effects of piracetam on 10-day administration.

THE ROLE OF SEROTONINERGIC BRAIN STRUCTURES IN NEUROTENSIN INFLUENCE MECHANISM ON DEFENSIVE BEHAVIOR IN RATS. NP Shugalev, AV Stavrovskaja, S Olshanskij, G Hartmann, L Lenard. State Research Centre of Neurology RAMS, Moscow, Russia; Neurophysiology Research Group, Institute of Physiology, Pecs University, Pecs, Hungary

INTRODUCTION: Out of the literature it is known about reciprocal attitudes between catecholamine- and serotoninergic (5-HT) structures of a brain in maintenance of defensive behavior. Increasing of dopaminergic system activity causes deterioration of a conditioned reflex of passive avoidance with its subsequent acceleration of extinction. On the other hand, serotonin synthesis inhibitor administration, para-chlorphenylalanine, on the contrary, facilitated development of active avoidance performance in rats. Infringement of development of a conditioned reflex of active avoidance in rats was observed after neurotensin administration into lateral ventricles of a brain. Such action of this neuropeptid is explained by its oppressing influence on dopaminergic brain structures. However, the specified neurotensin effects can speak its influence on function not only dopamin-, but also 5-HT structures of a brain and besides depend on a place of its administration in CNS. The main aim of research is finding-out of a role of 5-HT brain system in mechanisms of neurotensin influence on behavior after the painful stress in rats. **METHODS:** Male Wistar rats weighing 250-300g were used in the experiment. Intensity of escape reactions was estimated by latency of entering the dark chamber where the rats got a unavoidable electrical foot shock (2mA, 3s). Neurotensin (Sigma) or serotonin 1A receptor agonist, 8-hydroxydipropylaminotetralin (8-OH-DPAT) was injected into substantia nigra of the rat's brain (2,5μg in .7μl) 10 minutes before (or after) electrical shock presentation. Neurotensin microinjections were carried out 24 hours after electrical shock presentation too. The passive avoidance learning was tested for the next 4 days. Motor activity of the animals was studied in an "open field" and "elevated X-maze" tests. Influence of local neurotensin and 8-OH-DPAT microinjections into substantia nigra of a brain on behavior of rats with 5-HT neurons of dorsal raphe nucleus lesion was studied. The lesion was carried out by local administration of neurotoxin. The analysis of neurotensin and 8-OH-DPAT influences on recall of passive defensive reactions and also their influence on painful stimulation afteraction was spent. Serotonin and its metabolite 5-hydroxyindolacetic acid (5-HIAA) contents of the caudate nucleus (<50 mg) and hypothalamus of rat brain (<20 mg) were determined by HPLC. **RESULTS, DISCUSSION AND CONCLUSIONS:** We showed that lesion of 5-HT neurons led to increasing of intensity of passive avoidance reactions and motor activity in rats. The neurotensin microinjections into substantia nigra of a brain directly before or right after injuring of painful stimulation weakened effects of neurotoxin in rats with neurotoxic lesion of 5-HT neurons and restored parameters of intensity of passive avoidance reactions up to a control animal level. Such neurotensin microinjections also led to decreasing of latency of entering open arms of elevated X-maze and increasing of staying period in it. The behavioral effects of 8-OH-DPAT microinjections into substantia nigra were similar to neurotensin effects. In case of animals without lesion of 5-HT neurons the neurotensin microinjections led to infringement of recall of passive avoidance reactions and caused increase in motor activity. The administration of neurotensin in 24 hours after painful stimulation injuring directly before testing of a reflex did not weaken intensity of

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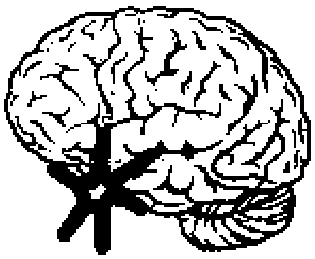

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