THE INFLUENCE OF NOWEL NEUROPEPTIDES, HOMOLOGOUS OF $ACTH_{15-18}$ AMINO ACIDS PRIMARY SEQUENCE, ON THE MEMORY STAGES IN THE MICE

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Introduction. For correction of the mnemonic disorders in patients with the acute ischemic stroke (AIS) many medicines is used. But efficacy of these drugs is insufficient. Therefore, this therapy needs an improvement. The class of peptidergic neuroprotector and nootropic drugs attracts particular attention. The series of tetrapeptides, homologues of $ACTH_{15-18}$ amino acids primary sequence, have been synthesized at the State Research Institute of Highly Pure Biopreparations (Saint-Petersburg). Previous research allowed to reveal their neuroprotective and nootropic properties. Particularly, they improve the memory. But their influence on the memory stages is unknown. The study is aimed to found the influence of neuropeptides on the 1^{st}, 2^{nd} and 3^{rd} memory stages in mice.

Material and methods. The white male mice weighing 18-22 g were used. The animals into groups of 5-8 were divided. Amnesia has been reproduced by scopolamine intraperitoneal injection at a dose of 1.5 mg per kg. The influence of the neuropeptides (laboratory codes КК-1, КК-2, КК-3, КК-5 and КК-10) on the memory stages was evaluated by the latent time of entry into dark sector at condition of conditioned reflex of passive avoidance (CRPA) test, changing the time of peptides administration regarding procedures training and testing CRPA. The anti-amnestic activity (AaA) of neuropeptides was calculated with the Battler formula. The peptides was injected intranasally (i/n) as aqueous solutions at a dose of 0.02 mg per kg. Reference drug is semax. It is chemical and pharmacological analog of investigated neuropeptides. It was injected intranasally at a dose of 0.02 mg per kg.

Results. All neuropeptides and reference drug semax show statistically significant influence on the amnesia caused by scopolamine administration. It appear in the improving of memory encoding (1^{st} memory stage), storage (2^{nd} memory stage) and retrieval (3^{rd} memory stage).

The ability of neuropeptides to stimulate of 1^{st} memory stage increase in the sequence semax < КК-3 < КК-1 < КК-2 < КК-5 < КК-10. Their AaA fluctuates at the level 93%-111% and prevail semax activity in 1.5-1.7 times.

According to the influence on 2nd memory stage the neuropeptides are in next order КК-10 < КК-2 < semax < КК-3 < КК-1 < КК-5. The AaA is 63.1%–100.3%.

At the conditions of scopolamine-induced amnesia investigated neuropeptides stimulates 3rd memory stage too. This activity increases in the sequence semax < КК-10 = КК-1 < КК-2 < КК-3 = КК-5. The AaA of investigated neuropeptides is 85.0%-95.6%, semax – 67.4%.

The statistical analysis indicates a lack of significant difference between anti-amnestic activity of neuropeptides. However, all of them statistically significant prevail semax by this mark.

Conclusions. The ability of investigated neuropeptides to stimulate of mice's mnemonic functions at conditions of m-cholinoblocker scopolamine-induced amnesia witness about their expressive nootropic properties. The mechanism of it perhaps consist in a positive influence on the brain cholinergic transmission. The obtained results demonstrate absent of peculiarity of investigated neuropeptides influence on the memory stages. This justify expediency of their use in many cases of memory disorders. It different the neuropeptides from known nootropic drugs as well as piracetam, which influences only on the memory encoding (1st memory stage) and used in higher doses.

In according to expressive neuroprotector properties of neuropeptides the obtained results witness about availability of it using aimed to improve the therapy of cognitive disorders of patients with AIS and many others CNS disorders.