Materials and methods. The experiment was performed on 30 rats, divided into 5 equal groups. The intact group received water intranasally, the 2nd, 3rd, 4th — a solution of the test compound in a dose of 0.1, 0.15 and 0.2 mg / kg. Comparison drug – Stresam "Bicodex" group 5, was administered per os (22 mg/kg). The following tests were performed: the light/dark test (LDT) and a forced swimming test (FST).

Results and discussion. In the light/dark test for group 2, the time spent in the light chamber increased by 30% compared to the control, but was less than the Stresam group (41%). The time in the light chamber for groups 3 and 4 is not significantly different. Latency for the rate to enter into the dark for groups of 0.1; 0.15 and 0.2 mg/kg was higher, respectively, in 2.4, 5.4 ($p<0.05$) and 1.9 times, compared with control. The latent time of group 2 was relatively equal to group 5. The number of peeps out and transitions between groups did not differ significantly. In FST, the total time of immobilization was dose-dependently reduced compared with control (by 10% – 0.1 mg/kg, 27% – 0.15 mg/kg). The immobilization time of the 4 groups is less than the control by 49% ($p<0.05$) and the Stresam group by 18%. Latent immobilization time increased for groups 2, 4 and 5 in 1.4, 2 ($p<0.05$) and 1.8 times, but for 3 groups it did not change significantly. The number of immobilizations, in comparison with control, for the 4 and 5 groups does not differ, and for the second it increased by 43%, and 32% for the third.

Conclusions. The modified NPY fragment in the light/dark test showed anxiolytic property, less in strength than in Stresam. In a forced swimming test the studied peptide significant showed the ability to delay and reduce the duration of the onset of despair behavior, which may indicate antidepressant-like activity.

STUDY OF THE MODIFIED FRAGMENT OF NEUROPEPTIDE Y INTERACTION WITH COMPOUNDS AFFECTING CENTRAL NERVOUS SYSTEM ACTIVITY

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Introduction. Neuropeptide Y (NPY) is a biologically active peptide involved in the regulation of many processes in the human body. NPY receptors are widespread both in the brain and in peripheral organs. This determines neuropeptide`s ability to affect on various processes such as food consumption, emotional state, vascular tone and so on. The studies were performed with a modified fragment of NPY, which is analogous of C-terminus – that is responsible for receptor binding.

Aim. Investigation of rats` behavioral responses under the conditions of intranasal administration of a modified NPY fragment and compounds that affect central nervous system (CNS) activity.

Materials and methods. The following drugs were used – caffeine-sodium benzoate («Caffeine-sodium benzoate», solution for injection 100 mg/ml, CJSC »Darnitsa Pharmaceutical Company», Ukraine) at a dose of 10 mg/kg, as a compound having psychostimulant and excitatory properties and gidazepam («Gidazepam IC®», tablets 0.05 g. «InterChem» SLC, Ukraine) at a dose of 15 mg/kg, as a compound having anxiolytic and sedative properties at this dose.

The studies were performed on 40 male rats weighing 150-180 g. Animals were divided into 5 equal groups. 1st — control animals that received a solvent (saline) intranasally (i.n.) for 40-45 minutes before the test, and after 20-25 minutes the solvent is intraperitoneal (i.p.). 2nd (caffeine) – animals that received i.n. solvent, and after 20-25 minutes solution of caffeine (10 mg/kg, i.p.). 3rd «caffeine+peptide» – peptide solution (0.1 mg/kg, i.n.) and after 20-25 minutes a solution of caffeine (10 mg/kg, i.p.). 4th (gidazepam) – received a solution of gidazepam 60 minutes before the experiment (15 mg/kg per os), and after 20 minutes the solvent was administrated i.n. 5th – «gidazepam+peptide received» gidazepam (15 mg/kg, per os.), and after 20 minutes peptide solution (0.1 mg/kg, i.n.).

Behavioral reactions were observed in a light/dark test. The latent time of the first entry into the dark compartment, the time spent in the light chamber, the number of transitions, the number of sightings from the dark compartment to the light, number of rearings, and total motor activity were recorded. Statistical processing of the results was performed using STATISTICA 6.1 using the Mann-Whitney U test. The difference was considered significant at $p<0.05$.

Results and discussion. Latency for the rat to enter into the dark compartment, compared to the control animals, in the caffeine groups was 2.2 times higher ($p = 0.014$), and in the «caffeine+peptide» groups by 1.4 ($p = 0.278$). Gidazepam increased the latency time by 7.6 times ($p = 0.028$) and the «gidazepam + peptide» group by 2 times (0.194). The same trend is observed with the parameter of time of stay of animals in the illuminated compartment. Caffeine increases the total time in the illuminated compartment by 2.4 times ($p = 0.02$), the «caffeine+peptide» group by 1.4 ($p = 0.328$), the gidazepam group 7.3 times ($p = 0.048$), the «gidazepam+peptide» group by 2.2 ($p = 0.234$). The number of sightings for groups of caffeine and «caffeine+peptide» is reduced by 20% in comparison with the control group, for gidazepam by 2 times, and «gidazepam+peptide» by 50%. The number of transitions does not differ significantly between groups. There was a significant increase in motor activity in the caffeine group, and a decrease in activity in the gidazepam group.

As a result of the experiment, we observed a significant increase in the latent time of entry into the dark compartment and the total time in the light chamber in the caffeine group, which is explained by the stimulating effect of caffeine, increased motor activity of animals, a higher number of rearings (2.3 times) were noted. Contrary to the caffeine group, the «caffeine+peptide» group did not show a significant increase in latent and total time. This may indicate a decrease in the excitatory effect of caffeine (10 mg/kg) by peptide. The latent and total time in the light compartment of gidazepam is significant more than the control group, and given the smaller number of sighting and significant inhibition of locomotor activity, we can assume significant anxiolytic properties of gidazepam, but with a pronounced sedative effect at a dose of 15 mg/kg. The group «gidazepam+peptide» showed a residence time of 3.3 times less in the illuminated compartment, and the number of sighting was 33% more than gidazepam. Locomotor activity in the group «gidazepam+peptide» did not differ from the control group. All this indicates the reduction of anxiolytic and sedative properties of gidazepam. According to the results of the experiment, the studied peptide in the light/dark test shows the ability to reduce the stimulating effect of caffeine and the inhibitory effect of gidazepam.

Conclusions. In the light/dark test, a solution of the modified NPY fragment at a dose of 0.1 mg/kg after intranasal administration showed the ability to reduce the effect of compounds capable of activating and inhibiting the CNS. The peptide under study restores the latent time of entry to the dark compartment and the total time in the light compartment to the level of control animals. This suggests that the test compound has regulatory, normotimic properties on the CNS.

EFFECT OF IODINE ON THE HUMAN BODY

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Introduction. Iodine is a trace element that is essential for the normal functioning of the human body. Depending on the age, the daily requirement for this element varies from 90 to 300 mcg. Iodine deficiency or excess can have serious consequences.

Aim. Our aim is to investigate the effect of Iodine on the human body.

Materials and methods. Review of scientific literature.