

INFLUENCE OF THE BRAIN RECEPTOR BLOCKERS ON THE BEHAVIOR OF RATS IN MORRIS WATER MAZE

Deiko R.D., Romanovich A.S., Lytkin D.V.

Scientific supervisor: Candidate of pharmaceutical sciences Deiko R.D.

National University of Pharmacy, Kharkiv, Ukraine

roman.deyko@gmail.com

Introduction. Development of the new medicines should be followed by discovery of their mechanisms of action. Many neurotropic agents have specific receptor-mediated action, and affect the number of brain neurotransmitter systems. In the practice of pre-clinical investigations, pharmacological analysis (PhA) is used for disclosure of mechanisms of action of novel medicines. For this purpose, the blockers of neurotransmitter systems are required. However, the task is complicated by the lack of knowledge about influence of abovementioned blockers on brain receptor systems in regime *per se*. Performing PhA for the novel agents, we do not know, whether observed effects are inherent to (1) the investigated agents, or – (2) to their cancelation by receptor blockers, or – (3) to receptor blockers oneself. Therefore, to differ effects of the receptor blockers (3) from cancelation of the effect of studied agents by these blockers (2) is very importantly to evaluate influence of the blockers under the conditions of regime *per se*.

Aim of the investigation. To evaluate influence of the series brain receptor antagonists on the indices of rats' behavior in the Morris water maze (MWM). There are following substances: *atropine sulfate*, *trihexyphenidyl* (M-, and M,N-cholinoblockers), *propranolol*, *doxazosin*, *yohimbine* (β -, α_1 -, and α_2 -adrenoblockers), *cyproheptadine* and *ondansetron* (5-HT₂- and 5-HT₃-serotonine blockers), *haloperidol* (predominantly dopaminoblocker), as well as opioid system antagonist – *naloxone*.

Materials and methods. The experiment was carried out on the 60 white male rats weighing 180-210 g. Animals were tested in MWM for cognitive functions. The learning trials were performed on 1st and 2nd days (2 episodes daily). On the 3rd day, the animals were tested. The blocker substances were injected intraperitoneally 30 min before testing trial at doses, that were described in the literature data. The indices of rats' behavior in MWM were recorded using web-camera. Results were processed using EthoVision XT 14.0, as well as Statistica 13.3.0 programs.

Results. Any statistically significant influence of the investigated neurotransmitter blockers on the rats' performance in the MWM have been not observed, comparing to the indices of the control group animals (table). Thus, some of the substances have shortened the rats' escape time in these conditions (f.i., *atropine* – by 61.3%, *naloxone* – by 75.6%), while *haloperidol* has prolonged search of platform (by 47.9%). However, these results were signified only tendency and were not statistically reasonable ($p \geq 0.05$ for all events). It witnesses about the absence of expressed influence of the string of brain receptor blockers under the conditions of acute experiment on the visuospatial memory of rats. Therefore, it allows to use these blockers for the PhA execution. In the case of cancelation of effects of the novel investigated agents on the background of some of the abovementioned receptor antagonists, we can afford to propose the concept of participation of appropriate neurotransmitter system in the realizing of effect of the investigated agent.

Table

Influence of the Investigated Receptor Blockers on the Rats' Escape Time in the Morris Water Maze, (M \pm m), n=6

Group	Time to find the platform (sec)	Difference with the control group (%)	P-value
Control	119 \pm 47	–	–
Atropine	46 \pm 12	-61.3	0.198
Trihexyphenidyl	119 \pm 41	–	0.873
Propranolol	64 \pm 19	-46.2	0.300
Doxazosin	98 \pm 50	-17.6	0.631
Yohimbine	105 \pm 16	-11.8	0.689
Cyproheptadine	74 \pm 21	-37.8	0.520
Ondansetron	82 \pm 48	-31.1	0.423
Haloperidol	176 \pm 61	+47.9	0.513
Naloxone	29 \pm 12	-75.6	0.064

Conclusions. Obtained findings are applicable for the further pharmacological analysis execution under the conditions of the Morris water maze. These reference values can be used to compare the influence of brain neurotransmitter antagonists *per se* with their joint application with the novel medicines. It can be useful to determine mechanism of action of the novel neurotropic agents.

IRRATIONAL NUTRITION AS A FACTOR IN THE DEVELOPMENT OF A PATALOGIES OF THE GASTROINTESTINAL TRACT IN STUDENT

Deineka A. S.

Scientific supervisor: Derkach N. V.

National University of Pharmacy, Kharkiv, Ukraine

Dviola9918@gmail.com

Introduction. Health this is one of the main values both for the person, and for the person as a whole. Today it is difficult to find those who, taking care of their condition, are trying to take only healthy food. This trend is especially relevant among students whose diets consist mainly of cheaper buying and cooking faster. It is in the student's life that human health is formed for life. In recent years, many scientists have noted the rapid development of diseases of the digestive tract from students.

Aim. Assessment of a student's nutritional assessment. Identify factors that influence the factors that are the basis for the development of pathologies of the gastrointestinal tract among students.

Materials and methods. Study of scientific data on malnutrition and pathology of the gastrointestinal tract, distributed among students. Conducting questionnaires among students.

Result and discussion. Analysis of nutrition shows that the diet characterizes the emergence of consumption of live animals and easily digestible carbohydrates, which differentiate against certain fibers, vitamins (groups B, E, etc.), macroelements (Ca, etc.), trace elements. With the passing of a student's year, the health of himself is getting worse.

The level of gastrointestinal diseases in students is rather high. More than half of the respondents do not eat at all, but bring something to the university. Absolutely in all students, lunch is not an ordinary meal. More than half of respondents rarely take hot dishes or only take dinner. Almost all students who have breakfast in the morning prefer foods that contain a lot of fast carbs. More than a third of respondents use coffee or tea instead of breakfast, sometimes with a sandwich or tea. More than half prefer to eat in the dining room or buffet, about a quarter – in cafes or catering establishments. The order of half of respondents daily consumes semi-finished products. Almost nobody cares about the use of healthy food. Almost all students eat fast food every month. Only a small number of people do not use such food at all. The qualitative description of dietary models indicates a deficiency of protein in a large proportion of students. Almost all students are worried about the lack of money for food. Concerned by the growing popularity of fast-food products for students that contain flavors, dyes, modified ingredients, including sandwiches, chips, carbonated, sweet and energy drinks. The state of health significantly affects not only the composition of food, but also the diet. It is established that most students eat after 19.00, others – mostly at night. The analysis of symptoms characteristic of diseases of the gastrointestinal tract – complaints of pain and other abdominal abnormalities were presented in some, these complaints were combined with complaints of heartburn, blisters or severity in the stomach, complaints of stomach upset, complaints of constipation, complaints of diarrhea. We also noted that 20% of students who filed complaints of diseases of the gastrointestinal tract had a bad habit, namely smoking.

Conclusions. Currently, due to prevailing socio-economic conditions, only a few people can be considered nutritionally balanced. The reason that a person rationally eats depends on his physical and mental development, the level of disability and life expectancy, as well as from the resistance of the organism to various adverse environmental influences.

1. High level of morbidity is explained by peculiarities of nutrition, social and industrial life.
2. To diseases of the gastrointestinal tract the most prone to people whose activities are associated with neuropsychiatric tension, especially in conjunction with irregular nutrition.