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Evaluation of the Effect on the Nervous System of Substances with an Alkaloid Structure Having Antitumor Activity

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ABSTRACT: Indole alkaloids including sedative activity of pyrazolone iodine methylate and pyrazolone chloride were caused by alcohol sleep and feeling against arousal or fear effects were studied by the Sonberg method. In this study, pyrazoline iodine methylate and pyrazaline chloride reduced sleep time by increasing the sleep time caused by alcohol, in the Sonberg method, the excretion of urine and excrement by experimental animals decreased due to noise and external factors. This indicates that the studied substances have a calming effect.

KEY WORDS: Sedative, pirazolone iodine methylate, pirazoline chloride, indole alkaloids, Sonberg method, urination, stool separation, ethyl alcohol

RELEVANCE

In our country, including at the Institute of Chemistry of Plant Substances named after Academician S.Yu. Yunusov of the Academy of Sciences of the Republic of Uzbekistan, a number of research works on the antitumor activity of natural and synthetic substances are carried out. As a direct continuation of these scientific studies, antitumor, as well as general pharmaco-toxicological properties of indole alkaloids are studied [1,2]. In the course of the research work, the properties of the indole alkaloids vincanin, pyrazoline iodine methylate and pyrosline chloride were studied, such as the features of acute toxicity and acute toxicity in various laboratory animals [3,4], the effect on cardiovascular, respiratory organs [5], as well as the effect on the general condition of experimental animals [6]. In this regard, within the framework of scientific studies of the effect of these alkaloids on the nervous system, screening studies of their sleep-inducing and calming activity were conducted under experimental conditions.

THE PURPOSE OF THE STUDY

Screening evaluation of sleep-inducing and calming properties of indole alkaloids under experimental conditions.

MATERIALS AND METHODS OF RESEARCH

All studies were conducted on mongrel laboratory white mice with a body weight of 20-22 g and white rats with a body weight of 180-220 mg/kg, which were kept and kept in standard quarantine conditions for 14 days. The studied substances iodine pirosaline methylate and pirosaline chloride were administered orally to experimental animals in the form of an aqueous solution in doses of 0.1, 1.0 and 10 mg/kg, and distilled water in equal volumes to animals of the control group. Neuropharmacological indications of the substance under study in accordance with the recommendations contained in the manuals and literature on motor activity, feeling arousal or activity against fear were studied using Sonberg methods [7-10]

- The sleep-inducing property of the studied substances was injected into the abdominal cavity of white mice with a 24% solution of ethyl alcohol in a volume corresponding to the body weight of the experimental animals, and the duration of sleep was recorded,

- When studying the properties of fear or feelings against arousal by the Sonberg method, white rats were placed in separate rooms, noting the repetition of urine and feces secretions caused by fear in them under the influence of an external calling sound or noise.

The discussion of the results obtained on the basis of the conducted studies was carried out in comparison with the control group and statistical processing of the results was done using the methods listed in R.V. Strelkov [12,13].

RESULTS AND THEIR DISCUSSION

In studies in the control group, the effect of ethyl alcohol starting from 26.4 ± 1.12 minutes, which in 100% of animals in this group turned out to be sleep and lasted up to 155.2 ±11.2 minutes, . It was observed that the sleep caused by ethyl alcohol in doses studied under the influence of iodine pyrosaline methylate began at 29.4±1.14, 31.7±0.96 and 33.6±1.89 minutes and lasted up to 138.3±4.96, 135.8±7.2 and 130.6±2.24 minutes, respectively. The results obtained on the basis of the studies are presented in Table 1.

Table 1. Effect of pirazoline iodine methylate on the start time and duration of sleep.

№	Substances and groups	Doses in mg/kg	The start time of sleep is in minutes.	The duration of sleep is in minutes.	Difference in relation to control in %
1.	Control group	Saline solution	26,4±1,12	155,2±11,2	
2.	Pirazalin iodine methylate	0,1	29,4±1,14	138,3±4,96	11
		1,0	31,7±0,96	135,8±7,2	12,5
		10,0	33,6±1,89	130,6±2,24	15,6

Note.P≤0.05 comparison with the control group

In studies, it was observed that Pirazoline iodine methylate reduces the start time of sleep to 3; 5.3 and 7.2 minutes, respectively, compared with the control group and the duration of sleep to 16.9; 19.4 and 24.6 minutes, respectively. Thus, Pirazoline Iodine Methylate did not exhibit the properties of causing drowsiness, reducing the time and duration of sleep onset.

Also exposed to substance, Pirazoline chloride such as pyrosaline iodine methylate it was observed that the sleep caused by ethyl alcohol in doses studied under the influence of iodine pyrosaline methylate began at 27,4±1,12, 28,1±0,36 and 30,2±1,89 minutes and lasted up to 141,5±1,96,139,6±1,2 and 136,2±2,24 minutes, respectively. The results obtained on the basis of the studies are presented in Table 1.

Table 2. Effect of pirazoline chloride on the start time and duration of sleep.

№	Substances and groups	Doses in mg/kg	The start time of sleep is in minutes.	The duration of sleep is in minutes.	Difference in relation to control in %
1.	Control group	Saline solution	26,4±1,12	155,2±11,2	
2.	Pirazoline chloride	0,1	27,4±1,12	141,5±1,96	8,8
		1,0	28,1±0,36	139,6±1,2	10
		10,0	30,2±1,89	136,2±2,24	12,2

Note.P≤0.05 comparison with the control group

In studies, it was observed that Pirazoline iodine methylate reduces the start time of sleep to 1; 1.7 and 3.8 minutes, respectiely, compared with the control group and the duration of sleep to 13.7; 15.6 and 19 minutes, respectively. Thus, Pirazoline Iodine Methylate did not exhibit the properties of causing drowsiness, reducing the time and duration of sleep onset. But it showed up weaker than that of pyrosaline iodine methylate.

In the Sonberg studies, stool and urine excretion was observed in animals of the control group under all external influences, that is, in all 10 of these influences, defecation and urine excretion was recorded within 90-120 minutes after administration of the test substance, respectively.

Table 3. Effect of pyrazoline iodine methylate and pyrosaline chloride on stool and urine excretion by Sonberg method.

№	Substances and groups	Doses in mg/kg	Frequency of stool and urine excretion as a result of each external influence	
			Repeated defecation	Repeated urine discharge
1.	Control group	Dis.water	10	10
2.	Pirazalin iodine methylate	0,1	7	7
		1,0	5	5
		10,0	2	2
3.	Pirazoline chloride	0,1	8	8
		1,0	5	5
		10,0	4	4

Thus, when exposed to Pirazolone iodine methylate and Pirazolone chloride, it was observed that defecation and urine excretion did not increase proportionally to each other from 20-30% to 60-80%, respectively, compared with the control group. Thus, based on the conducted screening study, it can be concluded that the studied substances significantly reduce fear and emotional arousal.

CONCLUSIONS

In this study, pirazoline iodine methylate and pirazaline chloride reduced sleep time by increasing the sleep time caused by alcohol, in the Sonberg method, the excretion of urine and excrement by experimental animals decreased due to noise and external factors. Thus, based on the conducted screening study, it can be concluded that the studied substances significantly reduce fear and emotional arousal. This indicates that the studied substances have a calming effect.

REFERENCES

1) Study of the physicochemical and technological properties of the substance of pyrozalin hydrochloride // Universum: technical sciences: electron. scientific magazine Rakhimova O.R. [and etc.]. 2021.9(90). URL: https://7universum.com/ru/tech/archive/item/12260
2) Abduazimov B.B., Adizov Sh.M., Mirzaev Yu.R., Yuldashev P.Kh. Hamroev T.T. Elements of the psychopharmacological action of pyrazoline chloride. Actual problems of the chemistry of natural compounds, scientific and practical conference of young scientists dedicated to the 110th anniversary of Academician S.Yu. Yunusov 2019.124.
3) Yu.R. Mirzaev, T.T. Khamraev, E.M. Ruzimov, Sh.M. Adizov, B.B. Abduazimov, B.N. Khandamov, B.J. Elmurodov, P.H. Yuldashev. (2022). Toxicological characteristics of vincanin hydrochloride and its derivatives in an experimental condition. Eurasian journal of academic research, 2(11), 1027–1033. https://doi.org/10.5281/zenodo.7244593
4) Mirzaev Yu.R., Khamroev T.T., Ruzimov E.M., Khamdamov B.N., Abduazimov B.B., Adizov Sh.M., Yuldashev P.Kh., & Elmuradov B.J. (2022). Comparative assessment of acute toxicity of vincanin hydrochloride derivatives in research conditions. International Journal of Medical Sciences And Clinical Research, 2(10), 9–15. https://doi.org/10.37547/ijmscr/Volume02Issue10-03
5) Mirzaev Yu.R., Khamraev T.T., Ruzimov E.M., Khandamov B.N., Abduazimov B.B., Adizov Sh.M., Elmurodov B.J., Yuldashev P.H.. (2022). Study of the effect of alkaloids isolated from the vinca erecta plant on cardiac activity under experimental conditions. Eurasian journal of medical and natural sciences, 2(11), 250–255. https://doi.org/10.5281/zenodo.7220861
6) Yu.R. Mirzaev, T.T. Khamroev, E.M. Ruzimov, B.N. Khandamov, B.B. Abduazimov, Sh.M. Adizov, P.Kh. Yuldashev, & B.J. Elmuradov. (2022). Evaluation of the effect of vincanin hydrochloride and its derivatives on experimental blood pressure and respiration under conditions. Oriental Journal of Medicine and Pharmacology, 2(04), 1–11. https://doi.org/10.37547/supsci-ojmp-02-04-01
7) Mironov A.N. Guidelines for conducting preclinical studies of drugs. Part one. - M .: Grif and K, 2012. - 944 p.
8) Instructions for preclinical testing of the safety of pharmacological agents. Tashkent - 2000
9) Khabriev R.U. (Ed.). Guidelines for the experimental (preclinical) study of new pharmacological substances. Moscow. 2005, p.832.
10) Preclinical toxicological study of new substances, including antitumor ones, carried out in accordance with the requirements of the Pharmacological Committee of the USSR Ministry of Health, Moscow, 1976.
11) European Convention for the Protection of Vertebrate Animals Used for Experimental and Other Scientific Purposes, ETS No. 123, Strasbourg (1986).

12) Belenky M.L. Elements of quantitative assessment of the pharmacological effect. - L., "Gosmetizdat", 1963. - 151 p.
13) Strelkov R.B. Statistical table for accelerated quantitative assessment of the pharmacological effect. Pharmacology and toxicology 1986. No. 4 p.100-104.