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DATA OF PHARMACOLOGICAL STUDIES OF THE NEW COMBINATION DRUG AMBRORITE

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Relevance of research. The most common symptom of upper respiratory tract diseases is cough. A distinction is made between a dry cough and a cough with sputum. Cough plays a protective function, and its purpose is to remove various foreign particles, viruses, bacteria from the respiratory tract, cleanse pathological bronchial secretions, and restore airway patency. For the purpose of pathogenetic and symptomatic treatment of acute respiratory diseases, preference is given to drugs with a combined effect. One of these drugs is Ambrorite - tablets developed by employees of the Tashkent Pharmaceutical Institute.

Ambrorite tablets are a new medicinal product, the pharmacological properties of which are determined by the active substances included in its composition: ambroxol hydrochloride and erythromycin. The drug has a secretolytic, secretomotor effect. Stimulates the serous cells of the glands of the bronchial mucosa, promoting increased mucus secretion and changing the ratio of serous and mucous components of sputum. In addition, activation of hydrolyzing enzymes and increased motor activity of the blinking epithelium of the bronchi helps to improve the separation of pathological secretions from the walls of the bronchi and its removal from the respiratory tract. The drug increases the content of surfactant in the lungs, prevents its destruction in pneumocytes, helping to improve the drainage function of the lungs.

Erythromycin has a bacteriostatic effect. When used in high doses, it can exhibit a bactericidal effect.

The spectrum of action includes gram-positive (Staphylococcus spp., producing and not producing penicillinase, including Staphylococcus aureus, Streptococcus spp (including Streptococcus pneumoniae, Streptococcus pyogenes), alpha-hemolytic streptococcus (Viridans group), Bacillus anthracis, Corynebacterium diphtheriae, Corynebacterium minutissimum) and gram-negative microorganisms (Neisseria gonorrhoeae, Haemophilus influenzae, Bordetella pertussis, Brucella spp., Legionella spp., including Legionella pneumophila) and other microorganisms: Mycoplasma spp. (including Mycoplasma pneumoniae), Chlamydia spp. (including Chlamydia trachomatis), Treponema spp., Rickettsia spp., Entamoeba histolytica, Listeria monocytogenes.

Resistant gram-negative rods: Escherichia coli, Pseudomonas aeruginosa, as well as Shigella spp., Salmonella spp. and others.

The purpose of this research was to study the pharmacological properties of the drug Ambrorite - tablets. To achieve this goal, tasks were set to study the mucolytic activity and antimicrobial effectiveness of the drug.

Material and methods: The study of mucolytic activity was carried out according to the well-known method on white outbred male rats, weighing 200 - 230 g, which were divided into 2 groups: control and experimental. The rats of the control group received water; the rats of the experimental group were administered an aqueous solution of Ambrorit tablets per os using a gastric tube at a dose of 30 mg/kg.

Next, the rats were anesthetized with intravenous urethane. To do this, a cannula was inserted into the trachea of rats, after which the animal was placed head down at an angle of 45˚. Sputum from the cannula was collected by suction using a syringe within 2 hours after drug administration [1].

Sputum volume was expressed as a percentage of untreated control.
The obtained data was processed using the STATISTICA program.
The antimicrobial activity of the drug Ambrorit tablets was determined by diffusion into agar on a solid nutrient medium by comparing the sizes of growth inhibition zones of test microbes formed when testing solutions of certain concentrations of the standard sample and the test drug.
For the analysis, sterile Petri dishes of the same diameter with a smooth flat bottom were used. 20 ml of a nutrient medium of a certain composition, contaminated with an 18-20 hour culture of test strains (Staphilococcus aureus; E.coli), was poured into cups installed on a horizontal table. Appropriate nutrient media were used for research.
Preparation of inoculum: to prepare the inoculum, a pure daily culture of microorganisms grown on solid nutrient media was used. Several similar, clearly isolated colonies were selected. A small amount of material from the tips of the colonies was transferred with a loop into a tube with a sterile 0.9% NaCl solution, bringing the inoculum density to exactly 0.5 according to the McFarland standard. The inoculum was used within 15 min of preparation.
Culture media were prepared according to the manufacturer's instructions.
Analysis: To carry out the test, three solutions of a standard sample (C1, C2, C3) were prepared from the drug Abroxol, produced by MERRYMED FARM LLC, Uzbekistan and three solutions of the test sample (I1, I2, I3) from the drug Ambrorit - tablets. The concentrations of the solutions were in a multiple ratio (1:2:4) and amounted to 100 µg/ml; 50 µg/ml and 25 µg/ml of compared drugs. On the frozen surface of the agar, holes were made in the center with a glass cylinder. The compared preparations were added to the wells in 100 µl from each dose, which amounted to 10 µg/µl; 5.0 µg/µl and 2.5 µg/µl in six Petri dishes.
Incubation: The dishes were placed in a thermostat at a temperature of 36-37º C for 18-24 hours.
Results:
The results of the studies to study the mucolytic activity of the studied drug Ambrorite - tablets showed that after administration of the drug, the volume of sputum in rats was 81.8% compared to the control group (Table 1).

Table 1

Study of mucolytic activity of the drug Ambrorite – tablets

Weight, g	**Dose, mg/kg**	**Sputum volume**	**Sputum volume per 1 ml/100 g**
Control group + purified water 2ml			
223,5 ± 5,2	-	0,11 ± 0,013	0,04 ± 0,005
Ambrorite - tablets			
227 ± 3,8	30	0,2 ± 0,012 R<0,05	0,08 ± 0,005 R<0,05

As can be seen from the table, the drug Ambrorit" - tablets, developed at the Tashkent Pharmaceutical Institute, Uzbekistan, has a more pronounced expectorant effect.
After incubation in a thermostat, zones of inhibition of the growth of microorganisms formed by solutions of the compared drugs were measured using a microbiological ruler Hi Antibiotic Zone Scale-CPW 297 with an accuracy of 1 mm. The microbiological activity of the studied drugs was assessed based on the size of the zones (Table 2).

Table 2

Zones of suppression of microorganism growth under the influence of Ambrorite – tablets

a drug	Concentration solution, µg/µl	Zones of inhibition of microorganism growth, mm		
		St. Aureus	E. coli	Pseudomonas aeruginosa
"Ambrorite"	I_1	33,6 ± 0,5	22,3 ± 0,5	25 ± 0,5
	I_2	28 ± 1,0	19,3± 0,5	22,4 ± 0,5
	I_3	25 ± 1,0	16,6 ± 0,5	19,6 ± 0,5
"Abroxol"	C_1	14 ± 1,0	12,6 ± 0,5	10,5 ± 0,3
	C_2	7,6 ± 0,5	10 ± 0,2	7,2 ± 0,2
	C_3	4,6± 0,5	7,3 ± 0,2	5,3 ± 0,1

As can be seen from Table 2, the drug Ambrorite - tablets had a pronounced inhibitory effect on the growth of such strains of microorganisms as St. Aureus, E. Coli and Pseudomonas aeruginosa, which was not observed with the drug Abroxol, produced by MERRYMED FARM LLC, Uzbekistan. That is, the drug Ambrorite - tablets has a pronounced antimicrobial effect.

Conclusions: pharmacological studies have shown:

1. The drug Ambrorit - tablets, developed at the Tashkent Pharmaceutical Institute, Uzbekistan, had a more pronounced mucolytic effect compared to the drug Ambroxol, produced by MERRYMED FARM LLC, Uzbekistan.
2. The drug "Ambrorite" - tablets have a pronounced antimicrobial effect.

References:

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