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STUDYING THE ANTI-INFLAMMATORY ACTIVITY OF THE NETINFLA MEANS ON THE "HISTAMINE" MODEL IN EXPERIMENTAL ANIMALS

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Abstract: a study was made of the anti-inflammatory activity of the new herbal remedy "Netinfla" on the "Histamine" model. The experiment was carried out on 42 white laboratory rats of both sexes, weighing 180-200 grams. Anti-inflammatory activity was studied in acute aseptic inflammation. According to the results of the experiment, the anti-exudative effect of Netinfla was proved .

Keywords: "Netinfla", herbal medicine, anti-inflammatory effect, experimental study.

Pharmacological regulation of inflammation processes is one of the most important problems in medicine. Unfortunately, at present, anti-inflammatory drugs from medicinal plants are not often used, which are better tolerated, less toxic, in contrast to traditional non-steroidal anti-inflammatory drugs (NSAIDs).

It should be noted that the modern range of anti-inflammatory drugs does not present a dilemma for the effective treatment of inflammatory diseases and their relapses. With the abolition of NSAIDs, in cases of side effects, the recurrence rate can reach 100%. More than 30 million people in the world take NSAIDs every day, while 40% of patients over the age of 60 are at risk due to gastro-, nephro-, and hepatotoxicity of NSAIDs. With a pronounced anti-inflammatory activity, long-term use of a certain pharmacological group of NSAIDs increases the incidence of side effects, in particular NSAID-induced gastropathy , drug-induced damage to articular cartilage, cardiovascular complications, etc. [3,4].

Thus, there is no doubt that the search for new anti-inflammatory drugs among compounds of natural origin - multicomponent extracts of medicinal plants is promising [1,2].

Although obtaining pure anti-inflammatory compounds extracted from natural products seems to be a difficult task, the study of extracts and pure compounds of natural products still allows the discovery of new medicinal properties. Pharmaceutical companies are not likely to show high interest and invest heavily in compounds that are difficult to patent. However, if proven effective and safe, the use of drugs derived from natural products should be protected at the state level and by public health authorities. Regular consumption of such foods can be a successful and safe strategy for the treatment of chronic inflammatory conditions.

The purpose of this work is to determine the anti-inflammatory activity of a herbal medicinal product, conditionally named " Netinfla ", for internal use on the " Histamine " model.

Materials and methods: studies were carried out in winter on 42 white rats of both sexes with an initial weight of 180-200 g, which were kept under natural light conditions and on a standard diet with free access to water and food. Experimental animals were divided into 6 animals in each group. A total of 6 groups and 1 control. Animals were removed from the experiment in accordance with the rules of the European Convention for the Protection of Vertebrate Animals used for experimental and other scientific purposes.

The influence of "Netinfla" on the exudative phase of the inflammatory reaction was assessed on the model of acute aseptic inflammation in animals using phlogogenic agents with different mechanisms of anti-inflammatory action. Aseptic inflammation in rats in the respective groups was induced by a single subplantar injection of a 0.1% histamine solution in a volume of 0.2 ml into the hind limb of white rats [5,6].

The classic anti-inflammatory drug Diclofenac was taken as the reference drug.

Means "Netinfla" was administered to experimental animals orally, in the form of a suspension, using a metal atraumatic probe, in doses: 500 mg/kg (1 ml/200 g), 1000 mg/kg (2 ml/200 g) and 1500 mg/kg (3 ml/200 g) one hour before phlogogen injection.

Means "Diclofenac" was also administered to experimental animals orally, in the form of a suspension, using a metal atraumatic probe, in doses: 30 mg/kg (1.2 ml/200 g), 50 mg/kg (2 ml/200 g) and 80 mg/kg (3.2 ml/200 g) one hour before phlogogen injection.

The control groups were injected with distilled water in a volume of 2 ml/200 g.

The evaluation of anti-exudative action in the inflammation phase was calculated by calculating the percentage of edema suppression in relation to the control. Measurements of the volume of the hind paw of animals were carried out on the Ugo Plethysmometer No. 37140 Basile (Italy). Measurements of hindpaw volume in rats were taken before and 60, 120, and 240 minutes after histamine administration.

The results of measuring the volume of paw edema are shown in Table No. 1.

Table No. 1 - The results of measuring the volume of paw edema in experimental animals on the "Histamine" model.

no. alive	The mass is alive. (in grams)	Rat paw volume (ml) before induction	Foot volume (ml) through		Paw edema volume (ml) through	
			2h.	4h.	2h.	4h.
Control						
1.	180	0.8	1.8	1.9	1.0	1.1
2.	182	0.8	1.7	1.9	0.9	1.1
3.	186	1.0	1.8	2.0	0.8	1.0
4.	183	0.9	1.8	2.1	0.9	1.2
5.	187	1.0	2.1	2.1	1.1	1.1
6.	198	1.1	2.0	2.2	0.9	1.1
Netinfla 500 mg/kg; 1 ml/200 g						
1.	200	1.2	1.9	1.8	0.7	0.6

2.	188	1.0	1.7	1.7	0.7	0.7
3.	200	1.2	1.8	1.6	0.6	0.4
4.	187	0.9	1.4	1.4	0.5	0.5
5.	185	0.9	1.6	1.5	0.7	0.6
6.	187	1.1	1.6	1.5	0.5	0.4
Netinfla 1000 mg/kg; 2 ml/200 g						
1.	200	1.1	1.6	1.4	0.5	0.3
2.	180	1.0	1.5	1.4	0.5	0.4
3.	184	0.9	1.4	1.2	0.5	0.3
4.	200	1.0	1.6	1.3	0.6	0.3
5.	198	1.1	1.5	1.2	0.4	0.1
6.	180	0.9	1.4	1.2	0.5	0.3
Netinfla 1500 mg/kg; 3 ml/200 g						
1.	193	0.8	1.5	1.4	0.7	0.6
2.	200	0.9	1.5	1.3	0.6	0.4
3.	195	0.8	1.4	1.3	0.6	0.5
4.	193	0.9	1.3	1.1	0.4	0.2
5.	180	1.0	1.4	1.2	0.4	0.2
6.	189	0.9	1.3	1.2	0.4	0.3
Diclofenac 30 mg/kg; 1.2 ml/200 g.						
1.	188	0.7	1.3	1.2	0.5	0.5
2.	189	0.9	1.4	1.2	0.5	0.3
3.	180	0.8	1.6	1.3	0.6	0.5
4.	186	0.9	1.5	1.2	0.6	0.3
5.	200	1.0	1.4	1.1	0.4	0.1
6.	200	0.9	1.3	1.1	0.4	0.2
Diclofenac 50 mg/kg; 2 ml/200 g						
1.	198	1.0	1.4	1.2	0.4	0.2
2.	200	1.0	1.5	1.3	0.5	0.3
3.	183	0.8	1.3	1.1	0.5	0.3
4.	190	0.8	1.2	0.9	0.4	0.1
5.	196	0.9	1.3	1.0	0.4	0.1
6.	195	1.0	1.4	1.2	0.4	0.2
Diclofenac 80 mg/kg; 3.2 ml/200 g						
1.	180	0.8	1.1	1.0	0.3	0.2
2.	190	0.9	1.3	1.2	0.4	0.3
3.	193	0.7	1.2	0.8	0.5	0.1
4.	188	0.8	1.3	1.0	0.5	0.2
5.	183	0.8	1.2	0.9	0.4	0.1
6.	195	0.9	1.3	1.0	0.4	0.1

The data given in table No. 1 prove the high activity of histamine as a phlogogen, because after 120 minutes, the volume of the hind paw in experimental animals increased significantly, and in some cases, increased by more than 2 times, compared with the initial volume.

The obtained results of the experiments were processed by the method of variation statistics according to Student's criterion at $p=0.05$. The results of statistical processing of the obtained results are shown in table No. 2.

Table No. 2 - The results of the study of the anti-inflammatory activity of the "Netinfla" ($M \pm tm$; $n = 6$; $p = 0.05$).

Group	Paw edema volume (ml) through			
	2 hours	% effect	4 hours	% effect
Control	0.933 (0.824÷1.041)	-	1,000 (1.033÷1.166)	-
Netinfla 500 mg/kg; 1 ml/200 g	0.616 (0.513÷0.719)	33.9%	0.533 (0.406÷0.660)	46.7 % _ _
Netinfla 1000 mg/kg; 2 ml/200 g	0.500 (0.433÷0.566)	46.4 % _	0.283 (0.180÷0.386)	71.7 %
Netinfla 1500 mg/kg; 3 ml/200 g	0.516 (0.377÷0.656)	44.6 % _	0.366 (0.195÷0.538)	63.4 %
Diclofenac 30 mg/kg; 1.2 ml/200 g.	0.500 (0.406÷0.593)	46.4 % _	0.316 (0.148÷0.484)	68.4 %
Diclofenac 50 mg/kg; 2 ml/200 g	0.433 (0.379÷0.487)	53.5 %	0.200 (0.106÷0.293)	80.0 % _
Diclofenac 80 mg/kg; 3.2 ml/200 g	0.416 (0.337÷0.495)	55.4 %	0.166 (0.081÷0.252)	83.4 % _

The data in table No. 2 show that Netinfla and the reference drug Diclofenac have a significant anti-exudative effect in the inflammation phase, as evidenced by a decrease in the severity of edema of the limbs of animals with aseptic inflammation induced by histamine.

As you can see, the anti-inflammatory activity of Netinfla ranges from 46.7% to 71.7% compared to the control group, and the anti-inflammatory activity of the reference drug Diclofenac ranges from 63.4% to 83.4% compared with those of the control group.

Conclusions: Netinfla has a pronounced anti-exudative effect in the inflammation phase, which is confirmed by a decrease in the severity of limb edema in animals compared to the control group.

The greatest anti-inflammatory activity is possessed by Netinfla at a dosage of 1000 mg/kg.

It should be noted that the "Netinfla" in some dosages is not inferior to the reference drug, and in some, even superior.

Realization of the specified action of "Netinfla" is ensured by a high content of biologically active substances that are part of the medicinal plants of the drug "

Netinfla ", such as essential oils, flavonoids, tannins. The listed biologically active ones have anti-inflammatory and anti-exudative effects.

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