INVESTIGATION ANTI-INFLAMMATORY PROPERTIES DIFFERENT GELS BASED ON THE LYSOZYME

ANNOTATION

The research is dedicated to investigation of anti-inflammatory activity of samples of dental gel based on the lysozyme. These gels has different quantitative and qualitative composition. In experiment was established that the highest anti-inflammatory activity shows the sample №2 (code name – "Lizostom"). Composition of gel: 0,3% lysozyme hydrochloride, hydroxyethylcellulose (GEC) 2,0%. “Lizostom” reduces expression edema of the hind paw of rats in 51,5% and exceeds in anti-inflammatory activity the comparator drug “Metrogyl Denta” in 26,7%.

Keywords: lysozyme hydrochloride, dental gel, anti-inflammatory activity.

INTRODUCTION

Inflammation is the basis of most human diseases and is a central and urgent problem of medicine throughout history [6]. Moreover, medical and social significance of inflammatory diseases is increasing every year worldwide and inflammatory periodontal disease is the exception.

According to WHO periodontal disease prevalent among people all over the globe (more than 80% of the population suffer from periodontal disease leading to tooth loss, occurrence of chronic infection in the mouth, lower reactivity, microbial sensitization and other disorders) [1, 2]. High prevalence of inflammatory diseases, significant changes in the dentition of the patient make this social problem, general health [3].

In connection with the above, the relevance of research and development of new drugs to treat inflammatory diseases is not in doubt.

In the department of industrial technology of drugs of the National University of Pharmacy, led by Professor Ruban A.A. for further pharmacological study designs were developed dental gels of various quantitative and qualitative composition based on lysozyme.

The aim of our research was study the anti-inflammatory activity gel samples from lysozyme hydrochloride different qualitative and quantitative composition.

MATERIALS AND METHODS

The experiment was conducted on 110 white nonlinear rats of both sexes weighing 160-200g, which were on a standard food and water diet in accordance with sanitary norms. [7]. During the experiment with animals treated in accordance with international principles of "European Convention for the protection of vertebrate animals used for experimental and other scientific purposes" (Strasbourg, 18.03.1986) and "General ethical principles of animal research" (Ukraine, 2001).

Anti-inflammatory activity was determined on a model of karagenine exudative inflammation back foot rat by onkometr [4, 8]. In 60 minutes to injection of solution karagenine to every test animals groups № 1-9 on the back foot was applied gel according to the number of the group; rats group number 10 applied drug comparison - gel "Metrogyl Denta ®» («UNIQUE Pharmaceutical Laboratories" India) rats group number 11 treatment was performed (control pathology) (Table 1).

Anti-inflammatory activity was assessed by the ability to reduce the swelling of the back foot experimental animals at the time of the maximum of its display (4 hours after injection) and determined by the formula:

$$A=100-(Pd\cdot 100)Pk$$

where:

A - antiexudative activity;

Rd - increment volume foot in the experimental group;

Pk - increment volume foot in the control group.

The results were treated statistically using the Student t-test [5].

RESULTS AND DISCUSSION

During the experiment established that inflammation in the rat back foot accompanied by a characteristic increase in its volume, which remained in the control group of animals for the duration of the experiment (Table 2). As known, typical local sign of acute inflammation - swelling, caused by increased permeability of the vascular wall of capillary vessels and venules, which occurs under the influence of various inflammatory mediators. In addition, acidosis causes swelling of connective tissue elements. Due to increased osmotic pressure increases exudation and local edema [2, 6].

Analysis of the data indicates that all samples presented № 1-9 show effect, reducing the severity of acute inflammatory edema foot hindlimb of rats by 20.1 – 51,5%. The most pronounced anti-inflammatory effect among samples of dental gel showed sample number 2 (Lysozyme 0,3%, 2,0% GEC) with the code name "Lizostom." Found that Lizostom reduces swelling back foot rat 4 hours after administration karaheninu by 51.5% and anti-inflammatory activity surpasses drug comparison Metrogyl-denta of 26,7% (Table 2).

CONCLUSIONS

New dental gel Lizostom shows pronounced anti-inflammatory activity (51,5%) and superior drug comparison - Metrogyl Denta 26,7%

Table 1

The experimental group of animals

№ group	Object of research	
1	Lysozyme 0,2%, GEC 2,0%	
2	Lysozyme 0,3%, GEC 2,0%	
3	Lysozyme 0,4%, GEC 2,0%	
4	Lysozyme 0,2%, GPMC 2,0%	
5	Lysozyme 0,3%, GPMC 2,0%	
6	Lysozyme 0,4%, GPMC 2,0%	
7	Lysozyme 0,2%, karbopol 1,0%	
8	Lysozyme 0,3%, karbopol 1,0%	
9	Lysozyme 0,4%, karbopol 1,0%	
10	Metrogyl Denta	
11	Tests pathology (untreated)	

Table 2

Anti-inflammatory activity of samples of dental gels based on lysozyme hydrochloride in the model of karagenine inflammation back foot of rats (n = 10)

№ group	Increase volume back foot after 4 h, conventional units	
1	19,6±2,06*	
2	18,4±2,07*	
3	19,5±1,09*	
4	29,3±1,84*	
5	30,3±1,25*	
6	29,2±1,46*	
7	30,3±1,07*	
8	26,8±1,60*	
9	19,7±2,12*	
10	28,5±1,88*	
11	37,9±1,02	

Note. * - P <0.05 relative performance of the control group.