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Study of the influence of topical application of Persantine on the condition of the oral mucosa of rats under the conditions of systemic action of pathogenic factors

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Abstract

Purpose of the study. The study of the protective role of the persantine when topically applied to the condition of the oral mucosa of rats under conditions of systemic exposure to the fluorine toxicant against the background of polyphenolic insufficiency.

Materials and methods. The experiment was conducted on 21 white rat-male 2 months ages that were distributed over 7 animals in a group. The 1st group is intact, the rats were fed on the vivarium diet. In the second group (control oh) in rat bespolifenolnogo background ration was prepared 5 times in week 5% fluorouracil solution per os at a dose of 12.5 mg / kg body weight of rats. The third group, under the combined effect of fluorouracil under the conditions of a bespolyphenol regimen, received topically as a part of a gel, persantine in a dose of 0.5 mg / kg 5 times a week. Gel - freshly prepared 7.5% potato starch was applied topically to the oral mucosa of the rats.

Results and conclusions. introduced against the background of the genotoxicant of fluorouracil in the alimentary deficiency of plant components , manifested in the oral mucosa antioxidant and anti-inflammatory effects. Under the influence of the chimes, the state of the vessels of the microvasculature was normalized due to a significant decrease in edema - the

packing density of the vessels and the coefficient of preservation of their lumen increased. There are data on the effect of various toxicants with a lack of plant food components on the occurrence of dental pathology [3].

Keywords: Curantil, local application, pathogenic factors, oral mucosa, rats.

Curantil (a derivative of pyrimidine) - antiaggregatory agent. Applied to prevent thrombosis in myocardial infarction, in violation of cerebral circulation. The drug expands the coronary vessels and improves their oxygen supply. In the mechanism of the vasodilating action of chimes, it is essential to enhance the formation of adenosine, one of the participants in the blood flow. Curantil is a competitive inhibitor of adenosine deaminase, the enzyme that breaks down adenosine. It reduces the formation of thromboxane A₂, stimulates the release of simple a cycline [1].

The adenosine mechanism of action on a₂, the adenosine receptors of smooth muscle cells, is the basis of the vasodilating properties of curantile, resulting in the rapid relaxation of vascular walls [2].

There are data on the effect of various toxicants with a lack of plant food components on the occurrence of dental pathology [3].

Purpose of the study. The study of the protective role of the chimes when topically applied to the condition of the oral mucosa of rats under conditions of systemic exposure to the fluorine toxicant against the background of polyphenolic insufficiency.

Materials and methods

The trial was performed on 21 white rats 2 months ages that were distributed over 7 animals in each group by random sampling. 1st group - intact, the rats were kept in a vivarium diet (DV). In Group 2 of the rat on the background of a non-polyphenol diet (BPR) [4] was given 5 times a week per os 5% fluorouracil solution (manufactured by Darnitsa, Ukraine) at a dose of 12.5 mg / kg body weight of rats (BPR + fluorouracil + gel). The 3rd group of rats with the combined effect of fluorouracil in the conditions of BPR received topically as part of a gel of chimes (manufactured by Berlin-Chemie, Germany) at a dose of 0.5 mg / kg 5 times a week. The rats were daily applied topically to the oral mucosa g spruce — freshly prepared 7.5% potato starch to control the effect of the carrier of the studied preparation. Animals were withdrawn from experience on the 70th day.

At the conclusion of the experiment, rats were killed by total bleeding from the heart (sodium thiopental at a dose of 40 mg / kg); the gums and cheek mucosa were separated . The objects of biochemical studies were blood serum, homogenates of the gums and cheek

mucosa. The level of lipid peroxidation processes was assessed by the content of malondialdehyde (MDA) by the thiobarbituric method [5]. In the serum and oral mucosa was determined by the activity of glutathio n- peroxidase (GPO) [6], superoxide dismutase (SOD) [7] and elastase [8].

The buccal mucosa was dissected, fixed in formalin and embedded in paraffin. Sections 6–8 μm thick were stained with hematoxylin and eosin, van gieson pikrofuksinom and toluidine blue [9]. The counting of epithelial cells mitoses was performed in the basal and spinous layers of the mucous membrane with an increase of 15×40 . The mitotic index (MI) was calculated based on the total number of cells counted and expressed as a percentage. Dual-core epithelial cells were determined in the spinous layer on a limited area of the slice with the same magnification.

On the sketches of the blood vessels of the microcirculatory bed (ICR), made at a magnification of 15×40 , the specific area of the wall of the blood vessel with the cells forming it and the specific area of its lumen were determined by a point method.

The results of the experiments were processed using t- criteria for the accuracy of student differences.

Research results

The effect of topical application of chimera was studied under the conditions of oral administration of a fluorouracil genotoxicant in the case of alimentary insufficiency of polyphenols. The effect of persantine on the processes of lipid peroxidation and the activity of antioxidant enzymes in the oral mucosa are presented in table 1. Studies have shown that, at the organism level, the drug did not significantly affect the peroxide processes — the level of MDA in the serum of animals did not change significantly as compared with the control group. The activity of the studied antioxidant enzymes in this research object also did not undergo significant changes (Table 1).

At the same time, chimes significantly reduced the content of lipid peroxidation products in the oral mucosa of rats. Thus, in the mucous membrane of the cheek, the chimes were 34% reduced ($p = 0.05$) in MDA content. At the same time, SOD activity was not significantly increased by 27% relative to the control group (Table 1). In the gum, SOD activity under the action of the drug increased 1.8 times (trend; $p = 0.08$); GPO activity - by 37%. The content of MDA in the gum decreased 1.9 times ($p = 0.01$; Table 1). A repair reduced the activity of the proteolytic enzyme elastase by 3.8 times ($p < 0.001$) in the blood serum of experimental animals (Table 2).

Table 1

MDA content and activity of antioxidant enzymes in rat tissues
(M±m; p)(M ± m; p)

groups of animals	MDA content ($\mu\text{mol} / \text{g}$)	Activity	
		GPO (mkat / g)	SOD
blood serum			
Control (C)			
C + persantine			
gum			
Control (C)			
C + persantine			
cheek			
Control (C)			
C + persantine			

Note. In tab. 1-5 confidence indicator p is calculated relative to .control group.

In the gum, elastase activity decreased threefold ($p = 0.002$); in the buccal mucosa - by 36% (trend ; table 2).

Table 2

The effect of persantine on the activity of elastase in the serum and the oral mucosa of the rats

(M ± m; p)

groups of animals	Elastase activity (nkat / l, nkat / g)
blood serum	
Control (C)	
C + persantine	
gum	
Control (C)	
C + persantine	
cheek	
Control (C)	
C + persantine	

Cytomorphological changes in the mucosa of the cheek intact e (LW) and the control (BDP + fluorouracil + gel) groups of rats submitted s to our previous article. In further studies, cytomorphological changes in the mucous membrane of the rat cheek under the influence of chimes in the conditions of action of pathogenic factors were studied.

Influenced it curantyl (BDP + fluorouracil + Curantylum + gel) in a multilayer epithelium buccal mucosa, as in the control group identified giperker and TOZ, papillomatosis, and acanthosis epithelial spinous layer. At the junction of thorns and the

horny layers and there were bubbles. Sometimes local detachment of the cornea on the layer was encountered. On the surface epithelium somewhere e p Uzziah met. Small groups of cells with pericellular edema were observed in the spinous layer. Eleidin products was somewhat removed izhen well. The basal epithels and the ocytes consisted of cells with small ones and large nuclei. Poke and exponent compensatory reduction reactions epithelial identify whether the following: ab mit otic index is valid but decreased compared with the control group, while the number of cells significantly increase (82%), which, apparently, is the fact of compensatory ($p = 0.002$; Table 3.).

Table 3

The effect of chimes on the indicators of compensatory-restorative reactions of epithelial cells of the mucous membrane of the rat cheek ($M \pm m$; p)

groups of animals	MI (%)	The number of binuclear cells (%)
Control (C)		
C + persantine		

In the lamina propria of the buccal mucosa and n observable swelling of the intercellular substance and swelling of collagen fibers and it is formed with small cavities in the ground connection to the connective tissue epithelial ridges and around small blood vessels. At the same time, lymphocyto nfiltration is similar cells decreased substantially.

In the tissues of the vascular wall of the ICR, a significant decrease in edema and swelling of endotheliocytes was observed. In this regard, the KPS_{ATP} indices increased by 19% ($p = 0.006$), and the vascular packing density increased 1.8 times ($p = 0.001$; Table 4).

Table 4

The influence of chimes on the state of the vessels of the ICR of the mucous membrane of the cheek of rats ($M \pm m$; p)

groups of animals	Packing density in ki vessels (%)	Vascular lumen conservation factor (K_{CHIC} , %)(To_{ATP} , %)
Control (C)		
C + persantine		

Special attention should be paid to the fact that under the influence of the chimes, the proportion of relatively large vessels of the ICR increased, which caused a significant increase in their volume index.

Conclusion

1. Curantile, introduced against the background of the genotoxicant of fluorouracil in the alimentary deficiency of plant components, caused a significant decrease in the POL level and activity of the proteolytic enzyme elastase in the oral mucosa of the rats, which indicates the antioxidant and anti-inflammatory effects of the drug.

2. In cytomorphological studies, under the conditions of the action of pathogenic factors, the chimes did not have a significant positive effect on the structural and functional state of the epithelium and connective tissue of the lamina propria of the cheek mucosa.

3. At the same time, under the influence of the chimes, the state of the vessels of the microvasculature was normalized due to a significant decrease in edema - the packing density of the vessels and the coefficient of preservation of their lumen increased. In relation to the vessels of the microvasculature, the chimes showed an anabolic effect.

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