

REACTION OF EXOCRINOCYTES OF CARDIAL SECTION OF THE STOMACH TO THE ADMINISTRATION OF “PLATEX PLACENTAL” DRUG AGAINST THE ACUTE EXPERIMENTAL GASTRITIS

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РЕАКЦІЯ ЕКЗОКРИНОЦИТІВ КАРДІАЛЬНОГО ВІДДІЛУ ШЛУНКА НА ВВЕДЕННЯ ПРЕПАРАТУ «ПЛАТЕКС-ПЛАЦЕНТАРНИЙ» НА ТЛІ ГОСТРОГО ЕКСПЕРИМЕНТАЛЬНОГО ГАСТРИТУ

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РЕЗЮМЕ

В роботі вивчена реакція екзокриноцитів кардіальних залоз шлунка при введенні препарату «Платекс-плацентарний» на тлі змодельованого гострого гастриту. Встановлено, що дія препарату «Платекс-плацентарний» на тлі гострого експериментального гастриту стимулює утворення та синтетичну активність як кардіальних glanduloцитів, так і келихоподібних клітин, в результаті чого запальний процес реалізується швидше, а захист слизової оболонки посилюється.

РЕАКЦИЯ ЭКЗОКРИНОЦИТОВ КАРДИАЛЬНЫХ ЖЕЛЕЗ ЖЕЛУДКА НА ВВЕДЕНИЕ ПРЕПАРАТА «ПЛАТЕКС-ПЛАЦЕНТАРНЫЙ» НА ФОНЕ ОСТРОГО ЭКСПЕРИМЕНТАЛЬНОГО ГАСТРИТА».

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РЕЗЮМЕ

В работе изучена реакция экзокриноцитов кардиальных желез желудка при введении препарата «Платекс-плацентарный» на фоне острого экспериментального гастрита». Установлено, что действие препарата «Платекс-плацентарный» на фоне острого экспериментального гастрита стимулирует образование и синтетическую активность как кардиальных glanduloцитов так и бокаловидных клеток, в результате чего воспалительный процесс реализуется быстрее, а защита слизистой оболочки усиливается.

Keywords: cardiac exocrinocyte, parietal exocrinocyte, goblet cell, acute experimental gastritis, “Platex-Placental”.

Pathological processes in the gastrointestinal tract are quite common [2, 5]. The decisive moment in the development of sickness rate of stomach and duodenum is an imbalance between factors of mucosa’s “protection” and factors of “aggression” that causes the autodigestion of the mucosa with the formation of the ulcerative defect. The factors of “aggression” include the hypertonus of vagus nerve, the increased production of gastrin or even its sufficient production, the hyperhistaminemia, the increasing number of acid exocrinocytes of stomach, the acidopeptic factor, the gastroduodenal dyskinesia, the violation of the mucosal barrier, the neurotrophic disorders, etc. The factors of “protection” include the state of mucus bicarbonate barrier of the stomach and duodenum, the activity of the physiological regeneration of the surface epithelium, the duodenal inhibitory mechanism [1, 3]. The study of the equilibrium constant of these factors in inflammatory processes of the stomach is a promising area of theoretical medicine; the search for new methods of correction of these pathological processes is the important task of experimental morphology [6].

Objective. The aim of this article is to study the histotopography and the number of cardiac stomach exocrinocytes and to define their quality in the administration of Платекс-плацентарний (Platex

placental) in the acute experimental gastritis and the administration of Платекс-плацентарний (Platex placental) against the acute experimental gastritis.

MATERIALS AND METHODS

The experimental study object was the stomach wall, which was withdrawn from 175 sexually mature male Wistar rats weighing 134–186 g, which were kept under the normal vivarium conditions of higher state educational institution of Ukraine “Ukrainian Medical Stomatological Academy” according to the “Guide for the Use of Laboratory Experimental Animals” (2006, Appendix 1) and the WMA Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects. The animals were divided into seven groups: Group I comprised 10 intact animals; Group II (control), 10 animals, which were intraperitoneally administrated with 1 ml saline; Group III (control), 10 animals that were made an incision on the outer thigh; Group IV (control), 10 animals, which were intraperitoneally administrated with 1 ml saline and were made an incision on the outer thigh; Group V (experimental), 45 animals, which were simulated with the acute gastritis by means of intraperitoneal administration of 5 mg of l-carrageenan (Sigma, USA) in 1 ml saline per animal; Group VI (experimental), 45

animals, which were administrated once with Платекс плацентарный (Platex placental) (state drug registration certificate № 73408–30020000, July 09, 2008); Group VII (experimental), 45 animals, which once were intraperitoneally administrated with Платекс плацентарный (Platex placental) against the simulated acute gastritis. The animals were taken from the experiment by an overdose of thiopental anesthesia, according to the established terms (on the 1st, 2nd, 3rd, 5th, 7th, 10th, 14th, 21st and 30th days of the experiment). The material collection was conducted after the animal euthanasia. The cardial section of the stomach was determined directly in the site of cardiac orifice in the middle of the lesser curvature [4]. The gastric tissue biopsy samples were placed in the epoxy using the known techniques; the semithin sections and ultrathin sections were made from them. They were stained with freshly prepared and twice filtrated 1% methylene blue solution and with 0,1% toluidine blue solution (Lynn J.A.). The polychrome stain was also used. The electron-microscopic examination was conducted using a microscope with an Olympus C 3040-ADU digital micro nozzle with the program adopted for this research (Olympus DP – Soft, license № VJ285302, VT310403, 1AV4U13B26802) and BIOREX 3 (serial number 5604).

RESULTS AND THEY DISCUSSION

In the Group I that consisted of intact rats, in the cardial section of the stomach there were found the glands of the same name, in which were detected the cardiac exocrinocytes (CE), parietal exocrinocytes (PE), goblet cells (GC), and the endocrine cells that are the highly specialized cells of epithelial lining of the cardiac glands. Principal cells were not found in the cardiac glands. The cardiac glands are placed rarely, therefore the lamina propria of the mucous membrane was pronounced better. The characteristic feature of cardiac glands was the formation of cysts, which were covered with slightly flattened epithelial cells. CE were placed in both sites: in the bottom areas, and in the gland bodies and necks, their number was averaged $245,12 \pm 11,38$. PE were mainly placed in the body of glands, their number was $15,44 \pm 1,46$. GC were placed in the neck of glands, their average number was $28,4 \pm 2,64$.

In the Groups II, III, and IV (control), during the analysis of quantitative indicators, localization, and ultrastructure of glandular cells of cardial section of the stomach, there was found that statistically there is no significant difference between the intact animals and the animals from control groups; it indicates that the procedure of the experiment itself does not affect the number and localization of exocrinocytes.

In the Group V (experimental), both factors have changed, the factors of “aggression” and the factors of “protection” (Figure 1, A). The average number of CE from the 1st day of the experiment gradually decreased; the maximum reduction of 74,1% acquired on the 7th

day of the experiment. The data of the control group of animals had not been reached even till the end of the observation period. The average number of PE conversely increased by 54,3% from the 5th day to the 10th day of the experiment and was higher than in the control group of animals anyway till the deadlines of observation. The average number of GC increased maximally for the 5th day of the experiment by 43,8%; but it has been kept at the same high level from the 3rd day to the 14th day. In our opinion, this is due to the compensation of reduction of CE number in response to the increasing number of PE and the course of inflammation process in the mucosa of the cardiac section of the stomach, which was caused by acute gastritis.

In the Group VI (experimental) (Figure 1, B), the average number of CE decreased for the 3rd day of the experiment only by 9%; their number was approaching to the targets till the 10th day. The number of PE increased by 27,7% for the 5th day of the observation period; in response to this, the number of GC increased by 29,9% for the same period. These changes demonstrate the stimulation of GC reproduction that is evidenced by electron microscopy (the increase of mitotic figures in the site of the necks of cardiac glands).

In the Group VII (experimental) (Figure 1, C), the maximum reduction of CE number occurred for the 5th day of the observation period only by 22,5% due to the effect of Платекс плацентарный (Platex placental) against the simulated acute gastritis. The number of CE increased maximally from the 3rd day to the 7th day of the experiment by 21,7% that is much less comparing to the Group V (experimental). By increasing of GC by 53,1% from the 3rd day to the 10th day of observation, the amount of aggressive secretions producing by PE was increasing; the protection of the mucosa increased due to the synthesis growth of mucoid secretion.

CONCLUSION

In acute experimental gastritis, a significant reduction of cardiac exocrinocyte number happens with a significant increase of parietal exocrinocytes; increasing the number of goblet cells is not able to compensate the loss of cardiac glandular cells. Accordingly, the protective abilities of the mucosa significantly reduced, which leads to the development of pathological processes.

With the administration of Платекс плацентарный (Platex placental), a small loss of cardiac exocrinocytes happens against the background of the stimulation of mitotic activity of goblet cells, resulting in the mucosal defense increasing.

The effect of Платекс плацентарный (Platex placental) against the background of the acute experimental gastritis stimulates the formation and synthetic activity both the cardiac glandular cells and the goblet cells resulting in the faster realization of the

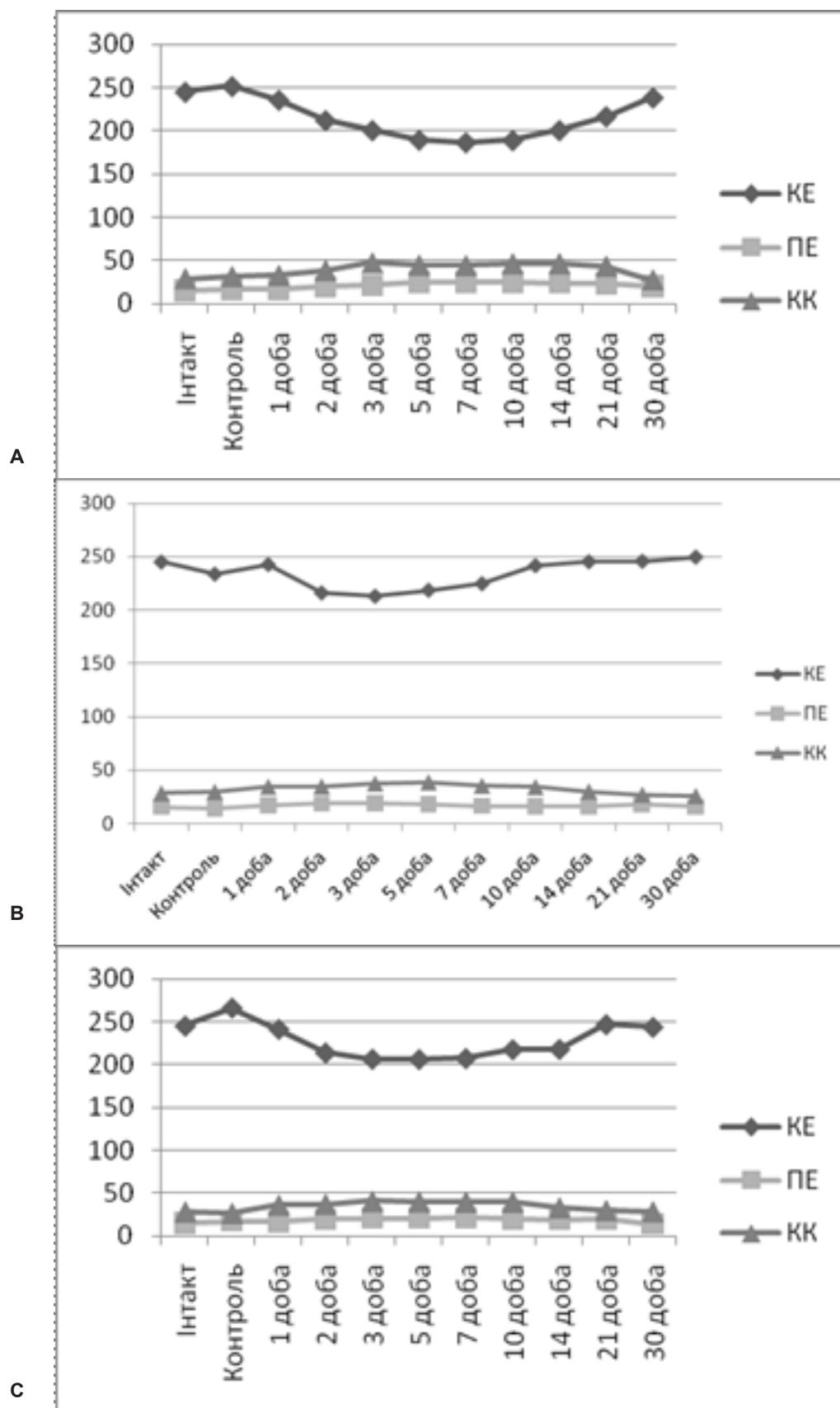


Figure 1. Change dynamic of average number of the exocrinocytes of cardiac glands of the stomach in the acute experimental gastritis (A), in the administration of Platex placental (B), in the administration of Platex placental against the acute experimental gastritis (C).

inflammation process, and the protection of the mucosa increases.

Possibilities of further studies. Further it is planned to study the exocrinocytes of fundic and pyloric glands of the stomach and their qualitative composition in the administration of Платекс-плацентарний (Platex placental) in the acute experimental gastritis and the administration of Платекс-плацентарний (Platex placental) against the acute experimental gastritis.

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