



## Morphological Characteristics of Morphometric Parameters of the Gastric Mucosa in Polypragmasia with Anti-Inflammatory Drugs

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**Abstract:** During the COVID-19 pandemic, excessive polypharmacy was allowed to improve the condition of infected patients, reduce body temperature, improve breathing, help with sputum withdrawal, relieve bone pain, etc., the causes of disability are also the result of unjustified use of drugs. A one-sided approach to prescribing is the leading cause of mortality and disability. The risk of polypharmacy is higher in vulnerable groups, including those with pre-existing conditions such as diabetes and rheumatic diseases, as well as older patients.

**Keywords:** polypharmacy, morphology, stomach, drugs, mucous membrane, morphometry.

**Relevance of the topic.** In connection with the aging of the population, the transition of many diseases into a chronic process, an increase in the number of diagnoses, polypharmacy is often allowed. While treating patients with complex medical problems with the right medications can improve clinical outcomes, quality of life, and life expectancy, the risk of adverse drug reactions due to polypharmacy is increased, leading in some cases to hospitalization and even death. Therefore, it is critical to have systems in place to ensure that medications are started only when indicated, that patients are fully informed about the benefits and possible complications of treatment, and that patients are regularly screened to ensure adherence to medications.

During the COVID-19 pandemic, excessive polypharmacy was allowed to improve the condition of infected patients, lower body temperature, improve breathing, help with sputum discharge, relieve bone pain, etc., the causes of disability are also the result of unreasonable use of drugs. A one-sided approach to drug prescribing is a major cause of death and disability. The risk of polypharmacy is higher in vulnerable groups, including people with pre-existing conditions such as diabetes and rheumatic diseases, and older patients. Both nursing home patients and out-of-home patients are at increased risk of complications from polypharmacy. Risk factors for gastrointestinal complications associated with anti-inflammatory drugs have been identified in a number of case-control and experimental groups, while others have compared results from studies of patients taking and not taking anti-inflammatory drugs.

**Purpose of the study.** It consists in studying changes in the morphological and morphometric parameters of the wall of the gastric mucosa under conditions of polypharmacy with anti-inflammatory drugs.

**Materials and research methods.** The materials and research methods are described in detail. The experiment was carried out in a vivarium on 180 five-month-old white male rats. Rats weigh 190-230 g organized. At the beginning of the experiment, all sexually mature rats were placed in quarantine for 7 days, after the exclusion of somatic or infectious diseases, they were transferred to the usual regime of the vivarium with 2 meals a day. To study the effects of polypharmacy in experimental groups of animals, the following anti-inflammatory drugs were used: aspirin (a group of non-steroidal anti-inflammatory drugs - salicylic acid derivatives); paracetamol (a group of non-steroidal anti-inflammatory drugs - anilide derivatives); ibuprofen (a group of non-steroidal anti-inflammatory drugs - propionic acid derivatives); dexamethasone (synthetic glucocorticosteroid); Plaquinyl sulfate (anti-inflammatory, antimalarial).



**Results of own researches.** In experimental animals, changes in the histomorphometric parameters of the main sections of the gastric mucosa were observed.

In the control group, the average number of intraepithelial lymphocytes per 100 cells of the epithelium of the villi in the cardiac part of the stomach was  $10.6 \pm 0.6$ , in the middle part  $13.8 \pm 0.3$  and in the distal part  $15.6 \pm 0.4$ . In the dynamics of the second and third groups, a clear increase in the number of intraepithelial lymphocytes was not detected, but in groups 4 and 5, intraepithelial lymphocytes increased by 21% and 34%, mostly in the pyloric stomach. This indicates the migration of lymphocytes to the gastric mucosa, infiltration of the mucous membrane. In the pyloric part of the stomach, the number of individual glandular tissues in the control group was  $11 \pm 0.3$ , and in the 5th experimental group after the use of 5 types of anti-inflammatory drugs, the amount of glandular tissue decreased to  $8.7 \pm 0.14$ , on average, which is comparable with the first group, 20% less. In the 4th group, the number of individual gland tissues decreased by 17% and amounted to  $9.1 \pm 0.21$ . In the 3rd group, the gland tissue decreased by 13.6%, and in the 2nd group by 11.8%, respectively.

The average number of separate glandular tissues in the corporal part of the stomach of rats is  $14 \pm 0.32$ . In the studied groups, the amount of tissue of individual glands in the body of the stomach decreased by 12.8% in 5 groups, by 7.8% in 4 groups, by 6.8% in 3 groups and by 5% in 2 groups, depending on the number of drugs used. In the studied groups, the amount of glandular tissue in the pyloric part of the stomach also decreased by 15% in 5 groups, by 11% in 4 groups, by 9.7% in 3 groups and by 1.9% in 2 groups. The experiment revealed a change in the size of glandular tissues and the distance between them in a macroscopic study of gastric preparations in white rats. In dynamics, the distance between the glandular tissues in the proximal stomach increased by 3.3% in the 5th and 4th groups, and in the 3rd and 2nd groups the distance between the glandular tissues did not significantly decrease. When examining the tissues of the gastric glands, it was found that there were no significant changes in the number of tissues of the gastric glands as a result of the action of anti-inflammatory drugs, that is, in the first group they amounted to  $18.4 \pm 0.32$  pieces, in the second group  $18.5 \pm 0.3$  pieces, in the third group  $17.5 \pm 0.35$  pcs., in the fourth group  $17.8 \pm 0.21$  pcs., in the fifth group  $18.02 \pm 0.21$  pcs.

According to the results of the study, a decrease in the size of the gland tissue was determined. In the control group, the average size of the glandular tissue in the proximal stomach was  $2.9 \times 3.25$  mm, in the 2nd group -  $2.8 \times 3.15$  mm, in the 3rd group -  $2.6 \times 3.08$  mm, in group 4 it was  $2.5 \times 3.0$  mm and in group 5  $2.2 \times 2.8$  mm in group equally. The size of the glandular tissue in the body part is larger than the glandular tissue in its proximal part, in the experimental groups the size of the glandular tissue in the body part of the stomach decreased as follows, that is, the average size of the glandular tissue in the first group was  $3.36 \times 4.25$  mm, in the 2nd group  $3.24 \times 4.24$  mm, 3rd group  $3.2 \times 4.2$  mm, 4th group  $3.1 \times 4.0$  mm and 5th group  $3.0 \times 3.9$  mm organized. According to the results of the examination, an increase in the distance between the glandular tissues was found. The distance between the glandular tissue of the cardia of the stomach increased by 17.2% in the 2nd group, 21.4% in the 3rd group, 27.3% in the 4th group and 37.7% in the 5th group compared with the control group. The distance between the glandular tissue in the body of the stomach increased by 2.1% in the second group, by 5% in the third, by 8.8% in the fourth and by 25.2% in the fifth group, respectively. In the pyloric region, the distance between the glandular tissues in the control group averaged  $25.46 \pm 0.59$  mm, in the second group the distance between the glandular tissues increased to  $28.6 \pm 0.65$ , in the third group  $30.3 \pm 0.59$ , in the fourth group  $33.1 \pm 0.57$  and increased to  $41.6 \pm 0.93$  mm in the fifth last group.

According to the revealed data, significant changes in the nodes in the glandular tissue of the walls of the stomach were also revealed. Compared with the number of nodes in the control group, it was found that the amount of glandular tissue decreased in number and size. And the distance



between the fields is much greater, which was clearly manifested in the glandular tissue of the pyloric part of the stomach.

**Conclusions.** Thus, the results obtained showed that the lymphoid tissue of the stomach causes different degrees of morphological and morphometric changes when exposed to different amounts of drugs. The effect of anti-inflammatory drugs on the lymphoid tissue of the stomach was studied experimentally on white rats. After exposure to more than three types of anti-inflammatory drugs, a significant decrease in the immune activity of the stomach was found. Determining the effect of polypharmacy on the structure of the gastric mucosa showed that polypharmacy has a sufficient level of risk for the body. Also, significant changes in aggregate lymphoid nodes and nodules were detected in the third and fourth groups of the study. It has been proven that the greater the number of drugs used, the more pronounced the pathological effect on the gastric mucosa. Determination of the effect of polypharmacy on the gastric mucosa with anti-inflammatory drugs showed that polypharmacy has a harmful effect on the immune response, reduces the activity of the immune system, and is quite dangerous for the body.

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