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Morphological and morphometric research of the fundus of the stomach with natural and artificial feeding

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The achievements of recent years in the improvement of women's milk substitutes provide new opportunities to offset the adverse effects of artificial nutrition. However, in order to provide a more differentiated approach to artificial feeding of infants, taking into account the characteristics of their development, it is necessary to know the advantages of a particular formula.

The purpose of this research: to research the relationship between the development and formation of the mucous membrane of the fundus of the stomach and some parts of the small intestine and the harmonious development of young children with natural (breastfeeding) and artificial feeding.

Material and methods: White outbred rats - 30 mature female rats and 100 newborn rats. All animals were divided into the following groups: 1g. – control group (n=), newborn rat pups who were breastfed (14 days); 2 gr.- (n=) - newborn rat pups fed cow's milk without probiotics (14 days) (first experimental group); 3 gr. (n=) - newborn rat pups fed cow's milk with probiotics (14 days) (second experimental group); Drinking water and food are freely available, monitored daily, updated every day between 9 and 10 am.

Newborn rat pups of the control group were fed with mother's breast milk for 14 days, newborn rat pups of the first experimental group 3 days after breastfeeding were transferred to artificial nutrition, which were fed with cow's milk. The rats of the second experimental group were fed cow's milk with the addition of a probiotic.

Results of our own research: With the thickness of the mucous membrane in control and experimental rats 540 ± 10.4 and 545 ± 11.6 μm (P> 0.05), the length of the glandular tube in the compared groups also does not differ significantly 130 ± 6.4 and 136 ± 8.5 μm (P>0.05), respectively. Narrow cylindrical tubes of the fundic glands fit tightly to each other, separated by thin layers of loose connective tissue and capillaries of the microvasculature.

By the 3rd day of the experiment, while maintaining the thickness of the gastric mucosa at the level of its values in control animals, its folds are smoothed out. In the composition of the mucus that fills the gastric pits, a varying number of microorganisms are detected.

Compared to control animals, the number of pit epithelial cells decreases by 135% on average (P>0.05). The pit-superficial epithelial cells become lower, although the nuclei are still relatively large, as a result of which the volume of the cytoplasm becomes smaller. Under the superficial pit epithelium, the stroma is edematous, loosened, the lumen of the capillaries is unevenly expanded; blood stasis is observed in some capillaries.

artificial nutrition is continued , then after 7 days of the experiment, compared with the initial value, thinning of the mucous, submucosal and muscular membranes occurs on average by 23, 23 and 13%, respectively. In the mucous membrane, the thickness of the mucous membrane, which consists of a fossa and a glandular tube, decreases unevenly: the pit- glandular index (the ratio of the length of the fossa to the

length of the gland) is 1:3. Pit-glandular epithelial - cellular index is 1:7. In control rats, the considered index is 1:3.

15 days after the transfer of animals to artificial nutrition, the thickness of the mucus layer on the surface of the stomach significantly decreases. The thickness of the mucous membrane is significantly ($P<0.05$), 34 and 21% less on average than in control animals and in the previous period of the experiment, respectively. The marked thinning of the mucous membrane occurs mainly as a result of a progressive decrease in the density and length of the fundic glands. The length of the fundic glands decreases by 40% on average compared to its value in control animals. During the last week (between days 7 and 15), the length of the fundic glands decreased by 25% on average. The pits continue to flatten, but less intensively: while the experiment time, its depth decreases by 30% on average. The glandular-pit index becomes equal to 2.7:1.

Thus, the same type of artificial nutrition of rats in the dynamics of the experiment causes structural transformations in all membranes, which is expressed in their atrophy. In the mucous membrane, the topography, ratio and ultrastructure of the main and parietal cells, which perform the main function of the stomach, change significantly. And although they are adaptive, associated with a violation of rational nutrition, the marked structural transformations at the level of the functional system of digestion and absorption, regulation of homeostasis can cause severe irreversible changes, diseases in various organs and systems.

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