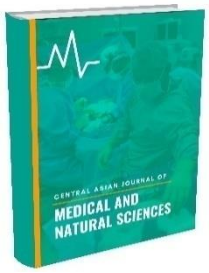
CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES



Volume: 04 Issue: 01 | Jan-Feb 2023 ISSN: 2660-4159

http://cajmns.centralasianstudies.org

Morphofunctional Changes in the Gastric Mucosa in the Dynamics of Physiological Pregnancy

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Received 25th Dec 2022,
Accepted 26th Jan 2023,
Online 8th Feb 2023

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Abstract: It is well known that during pregnancy there are often clinical signs of disorders of the gastrointestinal tract. Almost all pregnant women complain of certain disorders of the function of the stomach. It is no coincidence, therefore, that the appearance of such symptoms as nausea, vomiting, heartburn, once a perversion ate food in practically healthy women of reproductive age with a delay in menstruation is often used as an indirect sign of pregnancy and is regarded as a normal condition of pregnancy. In all likelihood, these manifestations are associated with certain dynamic functional and morphological changes in the stomach and all parts of the gastrointestinal tract.

Key words: gastrointestinal tract, morphological features, pregnancy, stomach.

Introduction. Despite the large number of gastroenterological diseases in women of reproductive age, little attention is paid to the study of the morphological and functional characteristics of the digestive tract during pregnancy. In addition, they relate mainly to the study of the physiology and pathology of organs during pregnancy. Given the fact that the study of morphological and functional features and adaptive processes occurring during physiological pregnancy is of great importance, that is why the results of our research will contribute to the formation of an idea of the mechanism of ongoing morphological changes in the gastric mucosa during normal pregnancy. Moreover it will also explain the features of the course diseases of this organ with subsequent adequate therapy. In this regard, in our experiment, we studied the features of structural and functional changes in the mucous membrane of the stomach wall during a physiological pregnancy.

Materials and methods. This paper presents the results of a study which dedicated to morphological and functional features of the stomach wall in its fundic part. The studies were carried out on white outbred rats weighing 140-160 gr, at various stages of pregnancy (13, 17, 19 and 21 days). Intact mature female rats served as controls. Light-optical (sections, 6-7 microns thick, stained with hematoxylin-eosin, according to Samsonov, semi-thin sections with fuchsine-methylene blue), morphometric (3) and electron microscope methods of investigation were used. Rats were sacrificed by rapid decapitation. Dated terms of pregnancy were obtained according to the method of I.P. Zapadnyuk (4).

Results. In the first half of pregnancy, the structure of the fundus of the stomach did not undergo visible changes. On the 13th day of pregnancy, compared with the control, there was a thickening of the gastric mucosa by 14.70/0, which was 604.415.04 µm. Its surface was evenly covered with a layer of mucus, which performed a protective function. The gastric fossae shortened by 39 %, their lumen expanded, the depth is 76.8±2.l µm. They were lined with prismatic-shaped superficial pit cells. The nucleus was oval, located basally. Above the nucleus, the cytoplasm was moderately filled with mucoid secretion and, when stained according to Samsonov, had a purple color. The length of the glandular tube increased and was 526.5±8.06 µm, which was 15.7 % more than in the control. When counting glandular cells, there was a tendency towards an increase in the number of main (by 10.4 %) and parietal cells (by 24.7 %), which was, respectively. By the 17th day of pregnancy, the mucous membrane thickened (615.l ±7.4 µm) compared to the previous period. Its surface was unevenly covered with a layer of mucin, which, when stained according to Samsonov, formed a crimson stripe. The length of the fundic glands was significantly increased (537.2±9.8 µm) compared to the previous period, and was 118 % in relation to the control. The depth of the gastric pits was equal to and did not significantly differ from the previous study period. In this period of pregnancy, there was an expansion of the collector veins located between the gastric fields. Parietal cells were oval or irregularly rounded, had eccentrically located rounded nuclei. Their number was on average 14,1±0,7 in the gland, which was reliable to the number of parietal cells in the previous period, and in relation to the control it was 34%. The number of main cells (15,5± 0,6)1 also significantly increased in comparison with the previous period and was 24 %. A large amount of mucus was noted in the primordial layer of the mucosa. The gastric pits were normal, their depth was on average 75 2 ± 2.8 µm. Although their depth was 40.5 % shorter than rats which were in control group and it remains unchanged from the 13th day of pregnancy. The length of the fundal cells was equal to 548.4 ± 5.8 µm, which was 20.5 % more than in the control, and significantly greater than the values of the cells during the study period. Due to the fact that the cells increased in size, the lumen of the fundic glands decreased. Thin layers of connective tissue separated the glands from each other. Compared with the previous period of the study, the number of main cells was significantly increased - which was on average 37 % more than those values of intact animals. Electron microscopically, they showed an expansion of the profiles of the granular endoplasmic reticulum and an increased in the volume of the Golgi complex. Parietal cells in this period of study were almost 41 % more in relation to the control. They were large, with light vesicles in the cytoplasm. Electron microscopically, they showed an expansion of intracellular secretory tubules, an increase in the number and length of microvilli. The blood and lymphatic vessels of the lamina propria were dilated. Numerous mitoses were revealed in the region of the neck of the glands. On the last day of pregnancy (21st), the gastric mucosa thickened by 19.2 % compared to the control and equaled 628.3±6.7 µm. The depth of the gastric pits remained unchanged (75.8 ± 2.04 µm), but it was much less in comparison with the control. They were smoothed, had a wide lumen. Here, the surface-pit cells were located less ordered than in controls. In the pits had a small amount of mucus. The length of the glandular fishes of the fundus increased, especially significantly on the 13th-17th-19th day of pregnancy. In addition, there was an increase in the absolute number of cells that make up the glandular tube. Due to the increase in the number and size of these cells, the lumen of the glands narrowed. Based on the above, it can be assumed that the increase in the thickness of the mucous membrane occured due to an increase in the length of the glandular tubes, and, accordingly, the main and naristal cells that made them up.

Thus, during a physiologically proceeding pregnancy, especially in its second half, the functional activity of mucus-forming, main and parietal cells also increases, that is, the main secretory functions of the stomach are activated (5). K.S. Lobyntsev et al. (6) observed the same picture in their works. On the basis of the above data, we believe that sex hormones play a very significant role in maintaining

the structural and functional correlations of the gastrointestinal tract. Changes occurring in the stomach, we associate with hyperestrogenization of the body by pregnancy. There is evidence in the literature that the development of hyperplastic processes in a number of organs is due to hyperestrogenization.

During pregnancy, especially in the second half, for the normal development of the fetus, an ever-increasing amount of nutrients are needed, which are delivered to the fetus from the mother's body. Consequently, the body of a pregnant woman performs additional work that requires strengthening or restructuring the activity of the most important systems and organs, in particular, the organs of the digestive system (9). During pregnancy, despite nausea, heartburn, etc., appetite increases, and, consequently, the amount of food eaten increases, the function of all digestive glands and excretory organs increases, metabolism is activated (9, 10). These metabolic shifts and morphofunctional restructuring of the organs and systems of the mother's body during physiologically current pregnancy are considered as a process of adaptation and mobilization of protective reactions. aimed at maintaining the health of the mother and providing optimal conditions for antenatal development of the fetus.

Conclusion.

1. During a physiologically proceeding pregnancy, especially in the second half, dynamic morphological and functional changes occur in the wall of the stomach, expressed in a gradual increase in the thickness of the mucous membrane, the length of the glandular tubes, the number of main and parietal cells, and in a decrease in the depth of the gastric pits.
2. During physiological pregnancy, gist structural changes occur in the gastric mucosa, aimed at more complete provision of the body of the mother and child with nutrients.
3. Structural changes in the gastric mucosa during pregnancy are adaptive and are aimed at increasing the secretory and digestive functions of the organ.

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