Biological sciences/8. Physiology of humans and animals

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**Ethiopathogenetic features of PTH pathology in offspring of rats on hypocaloric diet**

**Relevance**. In recent years there has been a steady increase in the incidence of gastroenterological diseases in childhood, among which the most common are pancreatic diseases. Therefore, timely diagnosis and research of pathogenetic mechanisms of diseases of the pancreas caused by exposure to various exogenous pathogenic factors is one of the most discussed problems of modern medicine [1,2]. In this direction, the alimentary factor is considered as one of the main causes of the development of pathologies of the pancreas of the child's organism [3,4].

**Goal**. Research and refinement of mechanisms of development of pancreatic damage under the influence of hypocaloric nutrition on the mother-fetus system in the prenatal period.

**Materials and methods**. The morphofunctional changes of the pancreas of the progeny of rats using histological and biochemical methods were studied [5]. 60 persons (60 p.) of experimental animals were used, which were divided into two groups: the main (30 p.) and control (30 p.). Offspring of each of the studied groups were divided into the following levels by the number (by 10 p.) of category: category A - newborns, category B - one month, category C - two months. All representatives of the main group received hypocaloric nutrition diet with a reduced content of nutrients (proteins - 1.38 g, fat - 2.11 g, carbohydrates – 7.37 g, representing 57.38 kcal per day); animal-control group - physiologically balanced diet (protein - 4.13 g, fat - 2.4 g, carbohydrates – 17.6 g, which was 104.5 kcal per day).

To assess the functioning of the pancreas in serum, the content of α-amylase and lipase, α1-antitrypsin, and insulin content were determined.

To assess the metabolic abnormalities in serum glucose levels were determined by free (non-esterified) fatty acids (NEFA), ketone bodies (KB). In addition, morphological changes in the parenchyma of the gland were evaluated.

**Results**. The study of offspring of the main group showed the following features for each age period:

Category A (newborns):

1)Reduction the amount of pancreatic parenchyma (by 18,5%, p˂0,001), stromal volume increase (by 41,4%, p˂0,001), reduction of the average area of ​​acini (by 7,7%, p ˂0,001) in comparison with the control group of the corresponding category. Changes were persistent, stored for two months after birth. Also, pancreofibrosisand swelling of the stroma were detected microscopically.

2) Reducing the area of ​​the islets of Langerhans (10.8% , р˂0,001), places of hypertrophy and hyperplasia, reducing β- and α-cells in the islets of Langerhans (21.6% and 25.0%, respectively, р˂0,001 ), decrease of morphofunctional activity of endocrinocytes.

Category B (one month):

1) Evidence of exocrine hypothyroidism by reducing the average area of ​​acini, hypolipasemia, reducing α1-antitrypsin (100%) hypoamilasemia (90%).

2) Lowering insulin levels by 25.7% compared with the control group on the background of hypoglycemia and hypoproteinemia (glucose and total protein were respectively 90.2% and 94.5% from the standard rate controls respective category), increased by more than 2 times NEFA and KB.

Category C (two months):

1) Hypoinsulinemiya more manifest compared with the category in the study group, with a slight increase of hypoglycemia raising adrenaline and noradrenaline. The KB content exceeds the control group's 6.4 times. These changes indicate a decrease in the ability of insulin-dependent tissues to use glucose as the main energy substrate, as a result of hypoinsulinemia, therefore, energy needs of the cells are largely ensured due to the metabolism of KB.

**Conclusions**. Low levels of energy substrates in the body of rats during pregnancy damage the apparatus of the pancreas of their descendants. This is evidenced by the presence of morphological changes in exocrinocytes, α- and β-cells, and as a consequence, a decrease in their functional activity. Revealed morphological changes of the pancreas in the offspring of the main group create preconditions for sustainable development of exo- and endocrine pancreatic dysfunction. It should be noted that these pathological changes occur in the offspring as long as they have a balanced diet after birth, that they all involve a violation of it during the prenatal period.

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