



PATHOHISTOLOGICAL STUDY OF THE PANCREAS OF PREGNANT RATS WITH EXPERIMENTAL DIABETES

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<p>Received: October 1st 2022 Accepted: November 1st 2022 Published: December 6th 2022</p>	<p>To identify the complex histotopographic relationships of the nerve centers of the brain, a research method is very important, which would make it possible to trace the differentiation of the layers of the cortex in all seven layers of the human cerebral cortex. For which morphometric research methods were used, as V.A. Betz (1891) noted: "The lack of accurate anatomy and histology of the brain comes from the lack of a research method, a method that would combine the convenience of naked eye research and microscopic research." For successful dissection, pretreatment of the brain is of great importance, which would give the appropriate plasticity to the brain tissue. To this end, a number of methods for processing brain tissue have been proposed, but most of them have proved to be of little use for solving problems.</p>

Keywords: rat, work, method, layer, cortex.

In the medical literature there is a sufficient number of works devoted to the experimental study of diabetes mellitus and pregnancy (Goldberg E.D., Eshchenko V.A., Bovt V.D., 2011; Peters – Harmel E., Mathur R. 2018). However, interest in this problem is increasing due to the fact that many issues are insufficiently equipped, and the available work is often contradictory. Of particular importance in the aspect of the problem of "diabetes mellitus and pregnancy" are the issues of therapy, since insulin and other antidiabetic oral medications can have a negative impact on the course of pregnancy, the development of the fetus and even the newborn in these conditions. The high frequency of perinatal mortality and the birth of defective children with diabetes give this issue even more extreme urgency.

There is no clear data in the literature to explain the cause of the "deterioration" or "improvement" of the course of diabetes mellitus during pregnancy. And, there is also insufficient evidence regarding the specific causes of fetal embryopathy and fetopathy in maternal diabetes (insulin, autoaggression, hyperglycemia, hyperlipidemia). Noteworthy in this regard is the fact of detecting similar changes in the pancreas in children born to mothers with prediabetes and latent diabetes with normal blood sugar and from mothers with obvious diabetes mellitus (V.G. Baranov, I.M. Sokoloverova, 1966, 1972).

All this points to the need for research that could reveal the hidden mechanisms of a peculiar pathological condition of the pregnant woman's body, undoubtedly affecting the course of pregnancy, the

development of the fetus and newborn, especially in early, subclinical forms of diabetes mellitus.

The aim of the study was to conduct experimental studies on white rats with latent and explicit alloxan diabetes and pathohistological study of the pancreas in order to fully understand the pathogenesis of complications and possible prevention of them in pregnant diabetic patients.

MATERIALS AND METHODS. The methodological approach to the formulation of the experiment was determined by the need to provide an almost natural intervention in the course of morphogenesis with minimal bio-damaging effect and to create an experimental model of diabetes close to optimal. Experiments were conducted on female and male white rats. Experiments were carried out on 30 female white rats (healthy -10, latent diabetes-10, explicit diabetes-10) and 30 males (healthy-10, latent diabetes-10, explicit diabetes-10). With the introduction of alloxan with the development of diabetes, lesions of other organs often occur, based on this, experiments were started 2-3 months before pregnancy.

To obtain latent diabetes, rats in the first month of postnatal life were injected subcutaneously with alloxanhydrate in the amount of 170-500mg per 1 kg of weight in a 5% freshly prepared solution according to the scheme developed by V.G. Baranov and I.M. Sokoloverova (1965). Animals whose hyperglycemia and glycosuria persistently disappeared after transient diabetes were tested for glucose tolerance.



To the group "hidden diabetes" we included animals that had transient alloxan diabetes in the immature period, followed by normoglycemia and aglucosuria, but the results of the glucose tolerance test deviated from the norm. To obtain explicit diabetes, the same dose of alloxan was administered as in the group with latent diabetes, only experiments were performed on mature rats with persistent hyperglycemia and glycosuria. 2-3 months after the introduction of alloxan and the diagnosis of diabetes, females in the estrus phase were hooked to males.

For a clearer understanding of the functional and metabolic shifts occurring in the maternal body during pregnancy, both in dynamics and at the level of organs and systems, we studied the pancreas of pregnant rats with latent and explicit alloxan diabetes. Pieces of pancreatic tissue were fixed in Buena's fluid and 10% neutral formalin. Histological sections were treated with general morphological (hematoxylin-eosin) and histochemical methods.

THE RESULTS OF THE STUDY. Microscopic examination in the pancreas of pregnant rats with latent alloxan diabetes revealed a more pronounced swelling of the interlobular connective tissue than in healthy pregnant women. In some areas, the connective tissue is compacted, the excretory ducts are greatly expanded and filled with secret. The exocrine apparatus is well expressed. The basophilic and oxyphilic zones of acinar cells differentiate well. There is a large number of leukocytes in the lumen of venous vessels. Plasmorrhagia and thickening of the vessel walls are noted in the stroma. Single large islands of Langerhans with sharply expanded sinusoidal capillaries are visible. Small islands consisting of 3-4 cells are also visible in the field of view. In one large island of Langerhans, only round cells are noted that are poorly differentiated.

With latent diabetes, in single islets of Langerhans, some nuclei contain a large amount of DNA, in other nuclei, large in size, DNA is mainly located under the nuclear envelope. The content of RNA in the cytoplasm of islet cells is moderate. When stained with gallocyanin in the exocrine terminal sections of acinuses, there is a high content of DNA in the nuclei and RNA in the cytoplasm of cells.

In the pancreas of pregnant rats with apparent alloxan diabetes, the same microscopic picture was revealed as in pregnant rats with latent diabetes: swelling and infiltration of the stroma, sharp expansion of sinusoidal capillaries, swelling and thickening of the arterial vessel wall, high DNA content in both nuclei

and RNA in the cytoplasm of the epithelium of the exocrine sections.

CONCLUSIONS

Thus, in the pancreas of pregnant rats with alloxan diabetes, a vascular reaction was characteristic, accompanied by edema of the stroma between the lobules, thickening and swelling of the walls of arterial blood vessels and expansion of the sinusoidal capillaries of the islets of Langerhans. Acinus cells with a high content of RNA in the cytoplasm and DNA in the nuclei are well expressed. The islands of Langerhans are of unequal size. At the same time, small and large hypertrophied islets were observed.

Based on the above, it can be concluded that in the arsenal of treatment of pregnant women, the proper place should be given to the appointment of insulin not only to patients with overt, but also with latent diabetes mellitus. However, many issues of this complex problem require further in-depth study.

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