



CHANGES IN LIVER STRUCTURE IN OFFSPRING UNDER THE INFLUENCE OF PRENATAL STRESS

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Annotation.

Prenatal stress is a psycho-emotional and physiological strain occurring in the maternal organism during pregnancy, significantly affects the development of embryonic organs. This article analyzes morphological and functional changes in the liver tissue of offspring under the influence of prenatal stress.

Scientific studies have revealed dystrophic changes in hepatocytes, compaction of sinusoids, impaired microcirculation, and increased markers of oxidative stress. These alterations may lead to disrupted liver development and metabolic dysfunction.

Furthermore, elevated levels of glucocorticoids in the maternal organism are shown to program fetal liver development, which may later result in fibrosis, steatosis, and various liver dysfunctions.

Keywords:

Cells, prenatal stress, offspring, liver, hepatocytes, morphology, microcirculation, dystrophic changes, oxidative stress, apoptosis, hypothalamic-pituitary-adrenal (HPA) system, embryo.

Аннотация. Пренатальный стресс — это психоэмоциональное и физиологическое напряжение, возникающее в организме матери в период беременности, оказывающее значительное влияние на развивающиеся органы эмбриона. В данной статье проанализированы морфологические и функциональные изменения в ткани печени потомства под воздействием пренатального стресса.

Результаты научных исследований показали наличие дистрофических изменений в гепатоцитах, уплотнение синусоидов, нарушение микроциркуляции, а также усиление признаков оксидативного стресса. Данные изменения могут приводить к нарушению развития печени и расстройству метаболических процессов.

Кроме того, установлено, что повышенный уровень глюкокортикоидов в организме матери программирует развитие печени плода, что в дальнейшем может привести к фиброзу, стеатозу и различным функциональным нарушениям печени.

Ключевые слова:

Клетки, пренатальный стресс, потомство, печень, гепатоциты, морфология, микроциркуляция, дистрофические изменения, оксидативный стресс, апоптоз, гипоталамо-гипофизарно-адреналовая система, эмбрион.

Annotatsiya.

Prenatal stress — homiladorlik davrida ona organizmida yuzaga keladigan psixo-emotsional va fiziologik zo'riqish bo'lib, u rivojlanayotgan embrion organlariga sezilarli ta'sir ko'rsatadi. Ushbu maqolada prenatal stress ta'sirida nasllarning jigar to'qimasida yuzaga keladigan morfologik va funksional o'zgarishlar tahlil qilindi.

Ilmiy izlanishlar natijasida hepatotsitlarda distrofik o'zgarishlar, sinusoidlarning zichlashishi, mikrosirkulyatsiyaning buzilishi hamda oksidlovchi stress belgilarining ortishi aniqlandi. Ushbu o'zgarishlar jigar rivojlanishining buzilishiga va metabolik jarayonlarning izdan chiqishiga olib kelishi mumkin.

Shuningdek, ona organizmidagi glikokortikoidlar darajasining oshishi homila jigari rivojlanishini dasturlashi aniqlangan. Bu esa keyinchalik jigarning fibrozi, steatozi va turli funksional buzilishlariga sabab bo'ladi.

Kalit so'zlar: hujayralar, prenatal stress, nasl, jigar, hepatotsitlar, morfologiya, mikrosirkulyatsiya, distrofik o'zgarishlar, oksidlovchi stress, apoptoz, gipotalamo-gipofizar-adrenal tizim (HPA), embrion

The gestation period is an important physiological process for both mother and fetus, and the mental and physical state of the mother has a significant impact on the health of the developing fetus. Stress during pregnancy can affect the psycho-emotional and physiological state of the mother and cause a number of negative changes.

Under the influence of stress, the amount of stress hormones cortisol and adrenaline in the body increases. The prenatal period is the most important and critical stage for the formation of organs and systems of the organism. At this stage, psychophysiological stress affecting the mother activates the hypothalamic-pituitary-adrenal gland (HPA) system.

The liver, as a central organ of metabolism, is highly sensitive to hormonal imbalance. Therefore, stress during pregnancy has a direct effect not only on the maternal organism, but also on the developing fetus.

Pregnancy-related liver diseases are observed in 3% of pregnant women. In order to correctly diagnose such cases, it is necessary to distinguish them from liver dysfunctions that are not associated with pregnancy.

During pregnancy, a number of physiological and hormonal changes take place. Some of them may have symptoms of liver diseases. In particular, it is observed increased heart rate, changes in arterial pressure, an increase in the volume of blood plasma (up to about 30%). At the same time, peripheral vascular resistance decreases. These changes form a hyperdynamic circulatory system.

Liver dysfunction can sometimes also be associated with toxicosis (vomiting) in pregnancy and is usually observed between 3–20 weeks.

Liver pathologies increase the risk of severe pregnancy complications, including spontaneous abortion, premature birth, fetal developmental abnormalities, and postpartum hemorrhage.

One of the main clinical signs of liver diseases is jaundice (ikterus). Cases of jaundice in pregnant females are directly related to pregnancy only in a small part. In most cases, it happens to pathologies of the liver independent of pregnancy.

Most often, cholestatic jaundice is detected in the third trimester of pregnancy and disappears by itself after childbirth. In rare cases, patients experience decreased appetite, nausea, vomiting, diarrhea, and abdominal pain. In some cases, itchy skin appears as the main symptom.

Conclusion

Prenatal stress is important both morphologically and clinically, increasing the risk of developing various complications. These include fetal growth retardation, premature birth, placental insufficiency, and postnatal metabolic disorders.

Additionally, prenatal stress causes morphological changes in liver tissue, which can later predispose offspring to obesity, fatty liver (steatosis), and hormonal imbalance during the postnatal period.

liver structure across generations due to prenatal stress" have allowed for a deeper understanding of the significance of prenatal stress in organism development. The studied data showed that psycho-emotional and physiological stresses during pregnancy are not merely temporary conditions but can also have a significant impact on the future life of the developing embryo.

In particular, studying these processes once again confirms that the prenatal period is an extremely delicate and important biological stage. Especially considering the close connection between the mother's body and the fetus, it became clear that the effects of external factors may not always be immediate but can manifest as long-term consequences.

From this perspective, prenatal stress should be evaluated not only as a clinical problem but also as a factor of broad social and biological importance. This indicates the importance of strengthening preventive measures in the future to form a healthy generation.

Overall, the studies conducted on this topic confirm the scientific and practical relevance of protecting the prenatal period, supporting maternal health, and reducing stress factors.

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