Growth restriction of the fetus

Fetal *growth restriction* (FGR *)* or intrauterine growth restriction/retardation (IUGR) is a condition where the fetus is unable to reach its genetically determined size (small as a result of a pathological process). The result can be a hypotrophic newborn (weight below the 10th percentile), but also a newborn with a normal birth weight (above the 10th percentile).

The causes can be diverse, the most common arise as a result of pathologies of the placenta. Compared to normally growing individuals, they have increased morbidity and mortality (10 times higher risk of perinatal mortality). There is no cure. We strive for primary prevention of risk factors on the part of the mother (cessation of smoking, regular examinations). The correct timing of childbirth also plays an important role.

Pathophysiology

Centralization of blood circulation occurs during hypoxia. This can cause ischemic damage to the intestine and the development of necrotizing enterocolitis , reduced renal flow is often responsible for oligohydramnios , impaired lung growth for chronic lung diseases. Shortening of femur length at the beginning of the second trimester is an early indicator of growth restriction.

Venous return is also affected (flow through the ductus venosus increases during hypoxia). The consequence of this is a decrease in blood flow to the liver, which leads to damage to their functions and a breakdown in glycogen formation (slowing down the growth of the abdominal circumference). Reduced or absent flow in *the ductus venosus* during atrial systole is a late indicator of cardiac failure leading to intrauterine fetal death.[1]

Risk factors for FGR/IUGR

The physiological growth of the fetus requires an adequate supply of oxygen and nutrients mediated by the placenta. Disruption of placental regulation by endocrine agents can also limit fetal growth and development.

- From the side of the fetus : Chromosomal aberrations , congenital developmental defects , genetically determined diseases , fetal infection , multiple pregnancies.
- From the mother's side : Obstetric history (FGR/IUGR, miscarriage, premature birth), short interval between pregnancies, malnutrition , smoking , alcoholism , drugs , psychotropic drugs , psychiatric diseases, excessive stress, IBD , chronic hypertension, preeclampsia , gestational diabetes , sickle cell anemia , antiphospholipid syndrome , systemic lupus erythematosus , glomerulonephritis , chronic renal failure , Leiden mutation , COPD , severebronchial asthma .
- From the side of the placenta (most common): Anomalies of the umbilical cord , tumors , abruption of the placenta , vascular malformation, thrombotic vasculopathy of the fetus .
- From the side of the uterus : Abnormalities and developmental defects, assisted reproduction .
- Endocrine factors : VEGF, PlGF, sFlt-1, PAPP-A, IGF .[1]

Consequences

- Perinatal : fetal death.
- Neonatal : respiratory distress syndrome (RDS) , heart failure , acute renal failure , hypoglycemia (due to reduced glycogen stores), hyperglycemia (due to low insulin production in very immature newborns), hypothermia (small fat stores), hypoxic-ischemic encephalopathy , convulsions polycythemia , hyperviscosity syndrome , thrombocytopenia , hyperbilirubinemia , food intolerance, necrotizing enterocolitis , coagulopathy , infectious complications, congenital malformations , adrenal insufficiency, death of a newborn.
- Long-term : bronchopulmonary dysplasia , delayed cognitive development, cerebral palsy .
- In adulthood : type 2 diabetes mellitus , obesity, hypertension, dyslipidemia , heart disease, heart attack, bronchitis, premature menopause.[1]

Diagnostics

It is performed in the 36th week of pregnancy.

We will perform fetal biometrics (size and weight determination). We will determine the Doppler flow parameters by measuring the pulsatile index (*a. cerebri media* , *a. umbilicalis* , *ductus venosus* and *aa. uterinae*). We then assess the measured values and create a biophysical profile of the fetus. This will give us information about any risks. And based on this, we can plan the next course of action (including early termination of pregnancy).

We use different examinations to diagnose a specific etiology (invasive diagnosis of structural abnormalities, maternal serology to detect teratogenic infections, exclusion of structural malformations on ultrasound, etc.).[1]

Links

Related Articles

- Hypotrophic newborn
- Low birth weight newborns

References

1. JANOTA, Jan and Zbyněk STRAŇÁK. *Neonatology.* 1st edition. Prague: Mladá fronta, 2013. pp. 207-217. ISBN 978-80-204-2994-0 .
2. ↑:a b c d e RENNIE, JM, et al. *Textbook of Neonatology.* 5th edition. Churchill Livingstone Elsevier, 2012. ISBN 978-0-7020-3479-4 .

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