

Fetal hydrops

Fetal hydrops (*hydrops fetalis*) is a serious disease of the fetus/newborn, characterized by pathological accumulation of fluids in two or more serous cavities and generalized soft tissue edema. Thus, it may include ascites, pleural effusion, pericardial effusion, and skin edema. Polyhydramnios and placental edema may also occur at the same time. It is a serious condition with a very high perinatal mortality (50-98%).^{[1][2][3]}

Etiology

Immunological

- hemolytic anemia during alloimmunization (Rh isoimmunization, etc.) – the incidence dropped dramatically after the introduction of prenatal examination of the mother's blood group and prophylaxis using anti-D immunoglobulin;

Non-immunological

- chromosomal defects: Turner syndrome, trisomy 21, 18, 13;
- cardiovascular disease: congenital heart defects (atrioventricular septal defect, hypoplastic left and right heart, isolated atrial and ventricular septal defects), arrhythmia;
- respiratory disease
- infectious: parvovirus B19, cytomegalovirus, toxoplasmosis, syphilis, etc.
- hematological: twin-to-twin transfusion syndrome, fetomaternal bleeding, alpha-thalassemia, etc.
- gastrointestinal, urological, neurological, skeletal etc..^[3]
- hereditary metabolic disorders: Gaucher disease, Niemann-Pick disease, GM1 gangliosidosis, congenital glycosylation disorders^[4]

Pathogenesis

The pathogenesis of non-immune hydrops is not fully understood. It develops as a result of dysregulation of fluid movement between the vessels and the interstitial space on the substrate:

- obstruction of lymphatic drainage in the chest and abdominal cavity;
- increased capillary permeability;
- increased central venous pressure;
- reduced osmotic pressure.^[3]

The placenta is thickened, apparently due to intravillous edema. A placental thickness of ≥ 4 cm in the 2nd trimester and ≥ 6 cm in the 3rd trimester is considered abnormal. With massive polyhydramnios, it can be thinner/compressed.^[3]

Clinical picture

Fetus:

- progressive hypoalbuminemia;
- ascites;
- pleural effusion;
- severe chronic anemia with secondary hypoxemia;
- heart Failure;
- increased risk of fetal death or poor tolerance of active labor.

Newborn:

- generalized edema;
- pulmonary edema and surfactant deficiency;
- congestive heart failure, hypotension and poor peripheral circulation;
- heart rhythm disorders;
- severe anemia with secondary hypoxemia;
- metabolic acidosis;
- secondary damage to other organ systems can cause hypoglycemia or thrombocytopenic purpura^[5].

Diagnosis

Prenatally

1. establishing a diagnosis

- ultrasound findings: ascites, pleural effusion, pericardial effusion, skin edema (> 5 mm).^[3]
- 2. determination of etiology
 - the goal is to identify particular causes that can be treated in utero and optimally time the birth (prematurity vs. risk of intrauterine death);
 - detailed ultrasound examination including echocardiography; MCA-PSV Doppler examination to determine severe fetal anemia;
 - genetic counseling (family history)
 - laboratory examination: blood count, blood group and screening of antibodies against erythrocyte antigens; Kleihauer-Betke test for suspected fetomaternal bleeding; serology (IgM and IgG): parvovirus B19, cytomegalovirus, toxoplasmosis; syphilis screening;
 - amniocentesis (for structural abnormalities): karyotype examination, microarray; possibly PCR for parvovirus B19, cytomegalovirus, toxoplasmosis; part of the collected amniotic fluid can be frozen for later analysis, e.g. for the detection of lysosomal storage diseases;
 - paracentesis (aspiration of ascites): cytological and biochemical examination.^[3]

Therapy

Prenatally

- in case of confirmed anemia, intrauterine transfusion is indicated.

Postnatally

- hydropic children in the vast majority of cases are born severely asphyxiated;
- their resuscitation and provision is very demanding and requires experience;
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 - we provide ventilation and oxygenation (UPV);
 - we ensure circulation (blood transfusion, albumin, plasma expanders, catecholamines);
 - after stabilization of circulation, further administration of fluids should be cautious;
- therapeutic thoracocentesis and paracentesis;
- causally we treat the underlying cause.^[6]

Sources

Related articles

References

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