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# Complications of Perinatal Central Nervous System Injury

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**Abstract:** According to UN estimates, disabled people make up 10% of the world's population, which gives rise to a number of ethical, social and economic problems, the level of solution of which is one of the most important characteristics of modern society. The structure of childhood disabilities is dominated by diseases of the nervous system - 19.5%, mental disorders - 14.3% and congenital anomalies of development-21%. In 60% of cases, childhood neurological disability is associated with pathology of the perinatal period, while 24% are patients with cerebral palsy. In the world every third child has various neuropsychiatric disorders, 80% of which are caused by perinatal factors, which determines the high social significance of this problem.

**Keywords:** pregnancy, labor process, gynecological diseases, diseases in infants.

**Introduction:** Before birth, the human brain resembles the brain of an adult and during life it increases by 3 times, and the body mass by 20 times. At the moment of birth, the brain has a full set of nerve cells allocated for the entire subsequent life - approximately 150 billion neurons. During life, new neurons will not be formed, and some of the data from the birth of cells will be systematically destroyed in the name of ensuring its stable operation.

**Methodology**: Studies on the epidemiology of respiratory distress in neonates are numerous, but the available data are extremely heterogeneous and cannot be extrapolated to all patients in neonatal NICUs. Low birth weight and low gestational age at birth are the main risk factors for adverse neonatal outcomes, especially in developing countries. A special risk group are extremely low birth weight preterm infants, especially in the presence of severe infections and sepsis. Severe hypoxemic respiratory failure in the neonatal period in full-term infants is observed in most cases with persistent pulmonary hypertension, which requires significant expenditures of all health care resourcesClassification of perinatal lesions of the nervous system in newborns (2000) developed by the Russian Association of Specialists of Perinatal Medicine (Volodin N.N., Burkova A.S., Medvedev M.I., Rogatkin S.O., Gorbunov A. Dev. M.G., Baranov A.A., Bombardirova E.L., Maslova O.I., Yatsyk G.V., Barashnev Yu.I., Petrukhin A.S., Samsygina G.A. and others.

**Analysis and results:** in the process of organizing the subject, the activities were compiled and divided into rounds.

**Hypoxic damage.** Chronic hypoxic distress syndrome or chronic hypoxia is a condition of the fetus caused not by direct damage to its tissues, but by indirect damage - through damage to the mother's body, placental tissues or umbilical cord. Chronic hypoxia occupies a leading place among the causes of damage to the central nervous system in the perinatal period, is an independent nosological unit of disease of the fetus and newborn, which occupies up to 50 % in the structure of perinatal morbidity and mortality.

**Causes of hypoxia:** Age of women giving birth for the first time (under 18 or over 30 years) Violation of the physiological course of pregnancy, leading to the development of chronic intrauterine hypoxia: somatic and infectious diseases of women, accompanied by impaired peripheral blood flow, deterioration of oxygen transport and metabolic disorders; burdened obstetric history (presence of abortions, miscarriages, stillbirths); gynecological diseases of infectious and endocrine nature; abnormal position of the fetus; pathological course of pregnancy: gestosis , pre-eclampsia, uterine hypertonicity , impaired placental blood flow, fetoplacental insufficiency, venous thrombosis, maintaining the uterus in tone.

**Asphyxia of the newborn:** A syndrome characterized by the absence of breathing or irregular respiratory movements in the presence of cardiac activity - a complex multiphase process caused by the acute cessation or limitation of oxygen, excessive accumulation of carbon dioxide and under-oxidized products of organic acids in the body.

Risk factors for neonatal asphyxia include: premature birth; diabetes mellitus, maternal obesity; gestosis (eclampsia); chronic hypertension (maternal hypertension); maternal Rh immunization, ultrasound signs of anemia or fetal hydrops; stillbirth or previous births in a state of severe asphyxia; clinical signs of an infectious disease in the mother immediately before or during labor; suspected congenital infection of the fetus.

**Intranatal risk factors:** premature birth (before 37 weeks); late birth (after 42 weeks); acute fetal hypoxia during labor; uterine rupture; amniotic fluid embolism; maternal collapse/shock (of any etiology) during labor ; placental abruption; placenta previa; placenta accreta; prolapse of umbilical cord loops; abnormal fetal position; use of general anesthesia during labor ; abnormal labor; presence of meconium in the amniotic fluid; fetal heart rhythm disturbances; shoulder dystocia ; instrumental delivery (obstetric forceps, vacuum extraction).

Consequences**.** Insufficient tissue perfusion and oxygenation may result in damage to the brain and other organs or death. Impaired cerebral circulation leads to increased intracranial pressure, which often causes extensive necrosis of brain tissue.

The main basis for the pathogenesis of perinatal hypoxic lesions of the central nervous system in newborns is: structural disorganization of cell membranes, changes in the activity of transmembrane transport.

In the brain of a child who has experienced hypoxia, two processes occur in parallel: reparation of the nervous tissue and its dystrophy. In this regard, the recovery phase can last for an indefinite period. The phenomenon of delayed psychoneurological disorders is observed. Restoration of the neurological status cannot be equivalent to recovery. Children who have experienced hypoxia in the perinatal period have cerebral vulnerability, which is revealed under increased loads.

**Birth trauma.** This is a local damage to the tissues of the fetus during labor, caused by the mechanical action of mechanical forces directly on the fetus, and not on the placenta or umbilical cord, manifested by a damaging effect in the form of a rupture, fracture, stretching, dislocation, as well as local circulatory disorders in the presenting part (venous congestion, stasis, edema, bleeding, thrombosis).

Causes leading to birth injuries: discrepancy between the size of the mother's pelvis and the size of the fetus; incorrect position or insertion of the fetus; pathology of the organs and bones of the mother's pelvis**.** Anomaly of labor activity: rapid , rapid, protracted labor; obstetric interventions: vacuum extraction , extraction by the pelvic end, application of forceps, iatrogenesis during cesarean section; protracted labor combined with perinatal hypoxia, rapid rotation of the head, forced extraction of the fetus.

Causes of spinal cord injury, coagulopathy. Vascular malformations , tumors are predisposing factors. a) abnormal presentation of the fetus (breech); improper obstetric assistance, excessive lateral traction or rotation of the trunk with a fixed head; predisposing factors are hypoxia, coagulopathy , vascular malformations .

Causes of birth trauma of the peripheral nervous system: abnormal (extended) presentation of the fetus, operative delivery - incorrect application of abdominal (less often exit) obstetric forceps.

Transient metabolic disorders : Critical level of indirect bilirubin in the blood (isoimmunization , hemolysis, bleeding, infections, polycythemia, liver damage, etc.)

**Toxic-metabolic disorders of the nervous system.** Toxic lesions of the nervous system in the fetus and newborns that occur when anesthesia and analgesics are used in the mother during pregnancy, labor and delivery , when the mother takes opiates and tranquilizers, when tobacco, alcohol and other addictive drugs are consumed in the perinatal period.

Lesions of the central nervous system in infectious diseases of the perinatal period. Damage to the central nervous system in neonatal sepsis. lesions in intrauterine infections (TORCH or STARCH syndrome): cytomegalovirus infection, toxoplasmosis, congenital rubella, ECHO viruses, syphilis.

The danger of STARCH syndrome and other viral infections is that they cause 80% of congenital malformations in children. Among them, the leading place is occupied by damage to the central nervous system, congenital heart and kidney defects, other organs and systems of the body, it has been established that infection of the fetus in the first trimester of pregnancy leads to the development of micro-, hydrocephalus, heart defects, gastrointestinal tract, genitourinary system, skeleton, cataracts, deafness. Infection in the second and third trimesters causes hepatosplenomegaly anemia, jaundice, hypotrophy, pneumonia, meningoencephalitis, sepsis in the fetus.

**Conclusion:** Treatment tactics for damage to the nervous system in children during the recovery period, nootropic therapy, antioxidant therapy, vasoactive agents, drugs regulating cerebral circulation, dehydration therapy, agents that remove toxic products from nerve cells, anticonvulsant therapy, agents that eliminate metabolic acidosis, agents used for the syndrome of increased neuroreflex excitability and muscle hypertonicity, agents that promote myelination of nerve tissue.

Physical rehabilitation methods. Massage - general, local, point, segmental, massage of the respiratory muscles (rectus abdominis, pectoralis major, oblique abdominal muscles, intercostal muscles - stroking, light rubbing), general relaxing massage, strengthening massage. Physical exercises - reflex, active, passive, passive breathing exercises, swinging on a ball, stimulation of weakened and absent reflexes of innate automatism.

Exercises in water - reflex, passive, active, underwater massage, baths with herbal infusions and decoctions, manual support, bathing. Positional treatment - fixation of limbs in special positions, kinesitherapy.

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