

REHABILITATION OF CHILDREN WITH CEREBRAL PALSY

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Abstract: Infantile cerebral palsy (ICP) is a concept that unites a group of motor disorders resulting from damage to various brain structures in the perinatal period. Cerebral palsy can include mono-, hemi-, para-, tetra-paralysis and paresis, pathological changes in muscle tone, hyperkinesis, speech disorders, shaky gait, movement coordination disorders, frequent falls, lagging of the child in motor and mental development. In cerebral palsy, there may be intellectual impairment, mental disorders, epilepsy, hearing and visual impairment. Diagnosed cerebral palsy is diagnosed mainly by clinical and anamnestic data. The algorithm of examination of a child with cerebral palsy is aimed at identifying concomitant pathology and excluding other congenital or postnatal pathology. People who have cerebral palsy should undergo rehabilitation therapy for life, receive medical, surgical and physiotherapeutic treatment as needed.

Keywords: status epilepticus, sinocapal status, neurology, basilar migraine

Introduction. According to world statistics, cerebral palsy occurs with a frequency of 1.7-7 cases per 1000 children under a year of age. In Russia, according to various data, this figure is 2.5-6 cases per 1000 children. Among premature babies the incidence of cerebral palsy is 10 times higher than the statistical average. According to recent studies, about 40-50% of children with cerebral palsy were born as a result of premature births.

If we talk about chronic diseases of childhood, cerebral palsy is one of the leading problems in modern pediatrics. Among the reasons for the increase in the number of patients with cerebral palsy is quite rightly called not only the deterioration of the environment, but also the progressive development of neonatology, which now allows nursing infants with various pathologies, including premature newborns with a weight of 500g.

Causes of cerebral palsy



According to modern ideas, cerebral palsy occurs as a result of the impact on the child's CNS of various damaging factors that cause the improper development or death of certain parts of the brain. Moreover, the action of these factors occurs in the perinatal period, i.e. before, during and immediately after the child's birth (the first 4 weeks of life). The main pathogenetic link in the formation of infantile cerebral palsy is hypoxia, to the development of which various causative factors of cerebral palsy lead. First of all, hypoxia affects those parts of the brain that are responsible for maintaining balance and providing motor reflex mechanisms. As a result, there are typical for cerebral palsy disorders of muscle tone, paresis and paralysis, pathological motor acts.

The etiologic factor of cerebral palsy, acting in the period of intrauterine development, is various pathologies of pregnancy:

fetoplacental insufficiency

premature detachment of the placenta

toxicoses

nephropathy of pregnancy

Rh conflict

threat of termination of pregnancy

as well as infections:

cytomegalovirus

rubella

toxoplasmosis

herpes

syphilis.

Somatic diseases of the mother (diabetes mellitus, hypothyroidism, congenital and acquired heart defects, arterial hypertension) and traumas suffered by a woman during pregnancy can also cause the development of infantile cerebral palsy.

Risk factors

Risk factors for cerebral palsy affecting the child during labor include:

breach presentation of the fetus

rapid labor

premature birth

narrow pelvis

large fetus

Excessive labor

prolonged labor

Discoordinated labor prolonged anhydrous period before delivery.

Only in some cases, birth trauma is the sole cause of cerebral palsy. Often severe labor leading to cerebral palsy is a consequence of an existing intrauterine pathology.

The main risk factors for cerebral palsy in the postpartum period are asphyxia and hemolytic disease of the newborn. Asphyxia of the newborn leading to cerebral palsy can be associated with amniotic fluid aspiration, various lung malformations, and pregnancy pathology. A more common postpartum cause of cerebral palsy is toxic brain damage from hemolytic disease that develops as a result of blood incompatibility or immunologic conflict between the fetus and mother.

Classification of cerebral palsy



According to the location of the affected area of the brain, cerebral palsy is classified into 5 types in neurology. The most common form of cerebral palsy is spastic diplegia. According to various data, infantile cerebral palsy of this form makes from 40 to 80% of the total number of cerebral palsy cases. The basis of this form of cerebral palsy is damage to the motor centers, leading to the development of paresis, more pronounced in the legs. When the motor centers of only one hemisphere are damaged, a hemiparetic form of cerebral palsy occurs, manifested by paresis of the arm and leg on the side opposite to the affected hemisphere.

In about a quarter of cases of cerebral palsy has a hyperkinetic form associated with damage to subcortical structures. Clinically, this form of cerebral palsy is manifested by involuntary movements - hyperkineses, which increase when the child is excited or tired. With violations in the cerebellum, an atonic-astatic form of cerebral palsy develops. This form of cerebral palsy is manifested by disorders of statics and coordination, muscle atonia. It accounts for about 10% of cerebral palsy cases.

The most severe form of cerebral palsy is called double hemiplegia. In this variant, cerebral palsy is the result of total damage to both hemispheres of the brain, leading to muscle rigidity, because of which children are unable not only to stand and sit, but even to hold their head independently. There are also mixed variants of cerebral palsy, including clinical symptoms characteristic of different forms of cerebral palsy. For example, there is often a combination of hyperkinetic cerebral palsy with spastic diplegia.

Symptoms of cerebral palsy

Infantile cerebral palsy can have a variety of manifestations with varying degrees of severity. The clinical picture of cerebral palsy and its severity depend on the localization and depth of damage to brain structures. In some cases, cerebral palsy is noticeable in the first hours of a child's life. But more often the symptoms of cerebral palsy become obvious after a few months, when the child begins to lag significantly behind in neuropsychiatric development from the accepted pediatric norms. The first symptom of cerebral palsy may be a delay in the formation of motor skills. A child with cerebral palsy does not hold his head for a long time, does not turn over, is not interested in toys, can not consciously move limbs, does not hold toys. When trying to put a child with cerebral palsy on his feet, he does not put his foot on the full foot, but stands on tiptoe.

Paresis in cerebral palsy can be only in one limb, have a unilateral character (arm and leg on the side opposite to the affected area of the brain), cover all limbs. Insufficiency of innervation of the speech apparatus causes a violation of the pronunciation side of speech (dysarthria) in a child with cerebral palsy. If cerebral palsy is accompanied by paresis of the muscles of the pharynx and larynx, there are problems with swallowing (dysphagia). Often cerebral palsy is accompanied by a significant increase in muscle tone. Expressed spasticity in cerebral palsy can lead to complete immobility of a limb.

In the future, children with cerebral palsy, paretic limbs lag behind in physical development, as a result of which they become thinner and shorter than healthy ones. As a consequence, skeletal deformities typical for cerebral palsy (scoliosis, chest deformities) are formed. In addition, cerebral palsy occurs with the development of joint contractures in paretic limbs, which aggravates motor disorders. Motor disorders and skeletal deformities in children with cerebral palsy lead to chronic pain syndrome with localization of pain in the shoulders, neck, back and feet.

Hyperkinetic cerebral palsy is manifested by sudden involuntary motor acts: turning or nodding of the head, twitching, facial grimaces, fancy poses or movements. The atonic-astatic form of cerebral palsy is characterized by discoordinated movements, instability in walking and standing, frequent falls, muscle weakness and tremors.

In infantile cerebral palsy may be observed strabismus, functional disorders of the gastrointestinal tract, respiratory disorders, urinary incontinence. About 20-40% of cases of cerebral palsy occurs with epilepsy. Up to 60% of children with cerebral palsy have vision problems. There may be hearing loss or complete deafness. In half of cases, cerebral palsy is combined with endocrine pathology (obesity, hypothyroidism, growth retardation, etc.).

Often cerebral palsy is accompanied by various degrees of oligophrenia, mental retardation, perceptual disorders, learning disabilities, behavioral abnormalities, etc. However, up to 35% of children with cerebral palsy have normal intelligence, and in 33% of cerebral palsy cases, intellectual impairment is expressed in a mild degree.

Infantile cerebral palsy is a chronic but not progressive disease. As the child grows and his CNS develops, previously hidden pathological manifestations may be revealed, which create a sense of so-called "false progression" of the disease. Deterioration of a child with cerebral palsy may also be due to secondary complications: epilepsy, stroke, hemorrhage, use of anesthesia or severe somatic disease.

Diagnosis of cerebral palsy

There are no specific diagnostic criteria for infantile cerebral palsy yet. However, some symptoms typical of cerebral palsy immediately draw the pediatrician's attention. These include: low Apgar score immediately after birth, abnormal motor activity, muscle tone disorders, lagging behind the child in psychophysical development, lack of contact with the mother. Such signs always alarm doctors about cerebral palsy and are an indication for mandatory consultation of the child by a pediatric neurologist.

If cerebral palsy is suspected, a thorough neurological examination of the child is necessary. In the diagnosis of cerebral palsy, electrophysiological methods of examination are also used:

electroencephalography
electromyography and electroneurography
evoked potential study
transcranial magnetic stimulation.

They help differentiate cerebral palsy from hereditary neurological diseases manifested in the first year of life (congenital myopathy, Friedreich's ataxia, Louis-Bar syndrome, etc.). The use of neurosonography and MRI of the brain in the diagnosis of cerebral palsy makes it possible to detect organic changes associated with cerebral palsy (e.g., optic atrophy, foci of hemorrhage or ischemia, periventricular leukomalacia) and diagnose brain malformations (microcephaly, congenital hydrocephalus, etc.).

A complete diagnosis of cerebral palsy may require the participation of a pediatric ophthalmologist, pediatric otolaryngologist, epileptologist, pediatric orthopedist, speech therapist, and psychiatrist. If it is necessary to differentiate cerebral palsy from various hereditary and metabolic diseases, appropriate genetic studies and biochemical tests are used.

Rehabilitation treatment of cerebral palsy

Unfortunately, so far, cerebral palsy refers to an incurable pathology. However, timely, comprehensive and continuous rehabilitation measures can significantly develop motor, intellectual and speech skills available to a child with cerebral palsy. Thanks to rehabilitation



treatment, the neurological deficit of cerebral palsy can be compensated to the maximum extent possible, the likelihood of contractures and skeletal deformities can be reduced, the child can be taught self-care skills and his/her adaptation can be improved. Brain development, cognitive development, skill acquisition and learning are most active up to the age of 8 years. It is during this period when cerebral palsy requires maximum rehabilitation efforts.

The program of complex rehabilitation therapy is developed individually for each cerebral palsy patient. It takes into account the localization and severity of brain damage, the presence of concomitant cerebral palsy hearing and vision impairments, intellectual disorders, epileptic seizures, individual opportunities and problems of the child with cerebral palsy. It is most difficult to carry out rehabilitation measures when cerebral palsy is combined with cognitive impairment (including blindness or deafness) and intellectual impairment. For such cases of cerebral palsy, special methods have been developed that allow the instructor to establish contact with the child. Additional difficulties in the treatment of cerebral palsy arise in patients with epilepsy, in which active stimulation therapy for cerebral palsy can cause the development of complications. For this reason, children with cerebral palsy and epilepsy should be rehabilitated using special “soft” methods.

The basis of rehabilitation treatment for cerebral palsy is LFK and massage. It is important for children with cerebral palsy to have them on a daily basis. For this reason, parents of a child with cerebral palsy should learn massage and physical therapy skills. In this case, they will be able to exercise their child on their own between professional cerebral palsy rehabilitation courses.

For more effective LFK and mechanotherapy with children suffering from cerebral palsy, special apparatus and devices are available in the respective rehabilitation centers. Among the latest developments in this area in the treatment of cerebral palsy, pneumocombisons have been used to fix joints and provide muscle stretching, as well as special suits that allow for some forms of cerebral palsy to develop the correct motor stereotype and reduce muscle spasticity. Such means help to maximize the use of compensatory mechanisms of the nervous system, which often leads to the mastery by a child with cerebral palsy of new movements, previously unavailable to him.

Rehabilitation measures for cerebral palsy also include so-called technical rehabilitation devices: orthodeses, shoe inserts, crutches, walkers, wheelchairs, etc. They make it possible to compensate for motor disorders, limb shortening and skeletal deformations present in cerebral palsy. Individual selection of such aids and teaching a child with cerebral palsy the skills of their use is of great importance.

Conclusions: Thus, despite significant motor impairments, many children with cerebral palsy can be successfully adapted to society. Parents and relatives of a child with cerebral palsy play a huge role in this. But in order to do this effectively, they need the help of specialists: rehabilitation specialists, psychologists and correctional pedagogues who work directly with children with cerebral palsy. They work to ensure that a child with cerebral palsy learns as much as possible the skills of self-care available to him/her, acquires knowledge and skills corresponding to his/her abilities, and constantly receives psychological support.

Social adaptation at the diagnosis of cerebral palsy is greatly facilitated by classes in specialized kindergartens and schools, and later in specially created societies. Their attendance expands cognitive abilities, gives children and adults with cerebral palsy the opportunity to socialize and lead an active life. In the absence of impairments that significantly limit motor

activity and intellectual capabilities, adults with cerebral palsy can lead an independent life. Such patients with cerebral palsy are successfully employed and can start a family.

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