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CONSEQUENCES OF TRANO BRAIN INJURY IN CHILDREN

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Abstract. Craniocerebral injury (CCI) is a mechanical injury to the skull and intracranial contents (brain, vessels, cerebral membranes and cranial nerves).
Key words: craniocerebral trauma, brain, children, cerebral membranes.

Introduction. In cases of serious trauma, the consequences are often obvious and may manifest themselves in the form of motor disorders (paresis, apraxia), speech disorders (aphasia, dysarthria), memory (amnesia), perception (agnosia), attention, intellectual and emotional disorders, and reduced ability to work. In such cases, each disorder is qualified, the degree of severity of the disorder is determined, the necessary drug therapy is prescribed and, corresponding to the clinical picture, rehabilitation measures - massage, physiotherapy, classes with a speech therapist and neuropsychologist, osteopathic treatment, etc. are prescribed.

There is an opinion that in childhood the brain is more plastic than in adults, and this gives greater opportunities for rehabilitation and better prognosis. However, in childhood it is often not possible to fully determine the consequences of the trauma and this is due to the lack of formation of certain brain structures by a certain age. This is well illustrated by the frontal lobes, which provide the function of programming and control over human activity, take part in intellectual and motivational processes and mature sufficiently by the age of sixteen. Brain development, in general, ends with the completion of myelianization at age twenty-five. Thus, after suffering an injury at an early age and recovering to the level of peers, a child may discover the delayed effects of a traumatic brain injury in adulthood when more complex activities begin to take shape.

Craniocerebral trauma in a child - a dangerous pathological condition characterized by damage to the cranial bones, brain and other anatomical structures as a result of traumatic impact. It often occurs with falls. Symptoms of traumatic brain injury in children include nausea and

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vomiting, dizziness, impaired consciousness and weakness. Immediate medical attention is required to assess the severity of the condition and administer therapeutic procedures.

Causes of pediatric traumatic brain injury

A child can suffer from this pathologic condition in a variety of ways, including falls, sports injuries, motor vehicle accidents, and peer assault. Falls are the leading cause of pediatric PMT, especially in younger patients. A child may fall at home, on the playground, or while riding a bicycle. Motor vehicle accidents are a cause of severe traumatic head injury.

Risk factors:

Age. Children are at a higher risk of PMT due to underdeveloped nervous systems, lack of coordination, and neglect of danger.

Gender. Studies have shown that boys are more likely to suffer a PMT than girls, which may be due to greater participation in risky games.

Participation in contact sports. This significantly increases the risk of traumatic injury to cranial bones and other anatomical structures of the head.

Lack of parental supervision. Children who are not properly supervised are more likely to engage in risky behaviors, which can lead to PMT.

Pre-existing medical conditions. Patients with certain pathologies, such as epilepsy or blood clotting disorders, are more susceptible to a PMT because of their impact on the body.

Parents need to consider these risk factors to prevent injury in their child. With proper supervision, dangerous situations can be avoided in most cases.

Types of traumatic brain injury in children

Specialists distinguish the following common types of brain injury in childhood:

Concussion. This is a mild form of traumatic brain injury that occurs as a result of a blow to the head or a sudden jolt that causes brain structures to move quickly inside the skull. Symptoms of a concussion include bouts of cephalgia, dizziness, confusion and fatigue. Most children make a full recovery from a concussion with time and rest, but repeated incidents can lead to more serious long-term effects.

Brain contusion. It is also usually caused by a severe physical impact in the head area. Contusions cause swelling and bleeding in the cerebral areas, which can lead to more serious symptoms. For example, seizures, difficulty speaking, and changes in behavior.

Diffuse axonal damage. It occurs when brain tissue abruptly oscillates in the skull box against an external force, causing nerve fibers to rupture. This type of injury can lead to extensive brain damage, long-term cognitive and motor impairment.

Penetrating injury. It develops when an object penetrates the skull and touches brain structures. The injury provokes localized damage to the brain and requires surgery to remove the foreign object and repair the damage.

Ischemic damage. If the brain is deprived of oxygen and blood flow during a traumatic brain injury, there is a risk of neuronal death. This type of injury occurs as a result of drowning, suffocation, or cardiac arrest. It is more likely to result in long-term cognitive and motor impairment.

Timely skilled medical care reduces the risk of dangerous complications. In severe cases, surgical intervention is often required.

Symptoms

Manifestations of craniocerebral trauma in children depend on the nature of the head injury and other factors. The following common symptoms are distinguished:

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Physical. Children with a traumatic brain injury experience headaches, dizziness, nausea, vomiting, fatigue and muscle weakness. They may also have trouble maintaining balance and coordinating in space.

Cognitive. A PMT can also affect a child's cognitive abilities, leading to memory problems, difficulty concentrating, decreased intelligence, and slow speed of processing information. Children may also have speech problems, including difficulty understanding spoken language or expressing their thoughts.

Emotional. A brain injury causes changes in a child's emotional state, leading to mood swings, irritability, anxiety, depression, and difficulty managing emotions. Patients may also have problems with social interaction. Children become withdrawn or unsociable.

Behavioral. Patients affected by traumatic exposure are characterized by impulsivity, aggression, disinhibition, and difficulty following rules and instructions. They also have problems with decision-making.

Sensory. A traumatic brain injury adversely affects sensory processing of information, resulting in sensitivity to light or sound, blurred vision, ringing in the ears, and altered taste or smell perception.

It is important to seek medical attention if a child experiences any of these symptoms after a head injury, as such pathology has long-term consequences in terms of the child's development and subsequent psychological well-being.

Diagnosis

Diagnosing the degree of impairment of higher mental functions in childhood due to head injury is a complex, multilevel problem influenced by many factors.

When the acute period after the injury is over, the necessary medical measures concerning the health and well-being of the child have been passed, it is necessary to adequately assess the damage inflicted on the nervous system and make a plan for the necessary rehabilitation measures.

When assessing the consequences of traumatic brain injury in adults, we compare the changes in the state of higher mental functions with their state before the trauma. When evaluating the consequences of traumatic brain injury in children, we should take into account the contribution that the affected function makes to the future development, as well as take into account possible delayed consequences that are not manifested at the time of examination. If the lesion is located in the frontal lobes, a preschooler may demonstrate sufficient programming and control capabilities for his age, solving logical problems and following complex instructions, but in school, when studying complex subjects, difficulties in mastering the material, difficulties in learning mathematics, dysgraphia and dyslexia may appear.

Additional difficulty with adequate assessment of changes in the nervous system of the child after a traumatic brain injury is caused by emotional immaturity in childhood, mood swings and fluctuations in performance, peculiar to different periods of childhood and adolescence.

Also, when working with a traumatic brain injury, it is necessary to take into account the fact that when the head is hit, the brain inside the skull, shaking, hits the skull wall opposite to the side of the impact. When the occipital part of the skull is struck, both the occipital and frontal parts of the brain are affected, often resulting in increased symptoms of impaired ERPs. The skull of children is less robust than that of adults, so the potential for injury is greater.

Conclusion: Thus, the prognosis depends on various factors, including the severity of the injury, the specific areas of the brain damaged, the age of the child, and the timing and quality

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of the medical care provided. Mild traumatic brain injury or concussion in children usually has a good prognosis, with most victims making a full recovery within a few weeks or months. However, some children may experience persistent symptoms, including headaches, dizziness, fatigue, and memory problems. Most children with mild traumatic brain injury eventually make a full recovery with appropriate rest and rehabilitation. Moderate and severe brain injury in children can have a more difficult prognosis. In some cases, children may experience long-term cognitive, physical, and emotional impairment. Factors affecting prognosis include the degree of brain damage, the child's age and developmental stage at the time of injury, and the presence of other medical conditions. Children with severe traumatic brain injury may require intensive medical and rehabilitative care, including physical therapy, occupational therapy, speech therapy, and cognitive rehabilitation.

Early and ongoing medical care and rehabilitation are critical to optimizing the outcomes of children with traumatic brain injury. Patients who receive prompt and appropriate medical treatment, including surgery, are more likely to have a good quality of life. Regular follow-up visits with a specialist will provide an opportunity to monitor progress and address any ongoing problems.

To prevent pathology, it is important to keep a close eye on your child, buy them protective equipment when playing sports and teach them the rules of behavior on the road. This will help to significantly reduce the risk of traumatic brain injury and other injuries.

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