

THE INFLUENCE OF RISK FACTORS ON THE DEVELOPMENT OF CEREBRAL STROKES IN CHILDREN

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ABSTRACT:

In recent years, the problem of stroke has become even more important due to the increase in childhood strokes. The relevance of studying this problem in children is due to the fact that, unlike an adult, a child who has had a stroke is forced to develop against the background of formed neurological complications, and many parents do not have the opportunity to meet the needs of such a child.

Keywords: cerebral stroke, children, risk factors, heterogeneity.

INTRODUCTION

Strokes are one of the most urgent problems of modern medicine, leading to a high percentage of disability and mortality. [1,2,3]. According to «Global Burden Diseases» the International project for the study the global burden of disease (2015), the worldwide incidence of stroke is 10.3 million cases per

year, while 80% is accounted for by ischemic stroke. Approximately 6.5-6.7 million cases end in death, and in case of survival, disability [4,5].

Of particular interest to the scientific community is stroke in young people due to the progressive trend of rejuvenation of the contingent and the features of etiopathogenesis, clinical course and outcome of the disease. [6,7].

But in recent years, there is information about the development of brain catastrophe in children and adolescents. Childhood stroke is an acute cerebrovascular accident that develops between the ages of 1 month and 18 years.

The frequency of occurrence of stroke in them is 0.4-0.7 cases per 100 thousand of the child population [8,9]. According to Shchederkina I.O. (2016) every year in the world, 6-13 children older than 1 month per 100,000 of the population suffer from stroke, while the incidence among the adult population is 175-200 per 100,000 [9]. It should be noted that death due to stroke is one of the leading causes of child mortality, while ischemic stroke

accounts for 5-16% of all cases of mortality, and hemorrhagic stroke - 29-41% [10].

In children, acute disorders of cerebral circulation can occur in the form of a transient ischemic attack, hemorrhagic and ischemic stroke, and the clinical symptoms are similar to those in an older contingent [11].

All of the above determined the purpose of our study to study the risk factors for the development of cerebral strokes in children.

An analysis of the literature data made it possible to study and systematize the causes and risk factors for the development of cerebral strokes in children, which are closely related to each other, but it is the risk factors that are the main source of the problem we are studying.

Thus, the main risk factors for the development of hemorrhagic stroke in children include arteriovenous malformation, arterial hypertension, blood diseases: Schönlein-Genoch disease (aplastic anemia, hemophilia, hemoglobinopathy, leukemia, DIC, vasculopathy), thrombocytopathies (hereditary: Ehlers-Danlos syndrome, collagen and subendothelial anomalies, thromboxane synthetase deficiency, membrane and intracellular anomalies; acquired: scurvy, hemoblastosis, myeloproliferative and drug thrombocytopathies, etc.), coagulopathy (hemorrhagic disease of the newborn, homocysteinemia, deficiency of protein C, vitamin C, cofactor heparin II, antithrombin III, plasminogen, etc.), thrombocytopenia (alloimmune, transimmune, autoimmune, heteroimmune, etc.) [9,10,11].

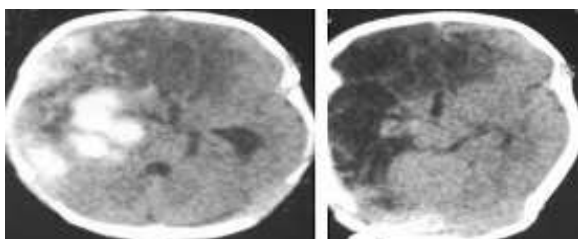


Figure 1. MRI of a 2-year-old child with hemorrhagic stroke due to hemophilia [14]

Ischemic stroke, in turn, is characterized by heterogeneity. There are several pathogenic subtypes in children: thrombotic, embolic, metabolic, hemodynamic and hemorheological. Ischemic stroke in this category can develop due to the influence of many different factors, among which the main role belongs to infectious diseases of the upper respiratory tract, mild head trauma (bruising of the soft tissues of the head) and increased physical activity. [12].

In a more detailed analysis, it was found that thrombotic stroke can be caused by such factors as pathology of the vessel in the form of its dissection, fibromuscular dysplasia, phakomatosis; vasculitis of infectious and non-infectious origin, as well as arteritis and arteriopathy; thrombosis of the sinuses and cerebral veins due to thrombophlebitis, infections in the maxillofacial region, retropharyngeal infections, inflammatory bowel diseases; viral (neuroAIDS, Coxsackie virus, herpes Zoster and herpes Simplex) and fungal angiitis and others [10,12].

Embolic stroke, in turn, is cardiogenic in nature in the presence of pathology in the cardiovascular system (congenital heart defects, arrhythmias, mitral valve prolapse with regurgitation, cardiomyopathy, atrial septal aneurysm, etc.), septic as a complication of bacterial infection of the respiratory tract and lungs, septic endocarditis and lung tumors, fatty due to fractures and fatty infusion, air with umbilical vein catheterization and heart surgery and placental in cases of placental infarctions, neonatal antiphospholipid-associated cerebral vasculopathy and intrauterine infection of the fetus [8,10,13].

Hemodynamic stroke in children develops in cases of migraine, cardiomyopathy, heart pathology in combination with narrowing or tortuosity of the main vessels of the head, as well as connective tissue dysplasia with

pathological tortuosity, hypo- and aplasia of intra- and extracranial vessels [10,11].

The development of ischemic stroke of the metabolic type can be observed in children with diabetes mellitus, Fabry disease, Menkes disease, Kearns-Seyer disease, MNGIE syndrome and MELAS syndrome, homocysteinuria [7,10,10].

Hemorheological stroke is more often the result of chronic diseases, pathological conditions accompanied by dehydration and massive surgical interventions. [8,10,12].

So, given the variety of risk factors leading to the development of cerebral strokes in children, the problem becomes interdisciplinary and age-dependent and requires the search for new and improvement of existing methods for diagnosing this pathology. Therefore, if a cerebral stroke is suspected, it is necessary to carry out a number of mandatory diagnostic measures: a clinical blood test with the determination of clotting time, lipid profile, glucose and electrolytes, ECG, chest x-ray, CT or MRI, and duplex scanning of the brachiocephalic arteries.

Thus, a thorough study of all risk factors for the development of cerebral stroke in children and adolescents will make it possible to develop an appropriate program of preventive measures to prevent the disease in this category of patients.

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