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MODERN METHODS OF TREATMENT OF ENCEPHALITIS COMPLICATIONS IN CHILDREN

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Abstract: Encephalitis in children is an inflammation of brain tissue caused by infectious, autoimmune, or paraneoplastic factors. The disease is manifested by focal abnormalities, seizure syndrome, and meningeal signs. Nonspecific symptoms include fever, malaise, respiratory and dyspeptic disorders. Diagnosis is represented by modern methods of neuroimaging (MRI, CT), virological and serological examination of cerebrospinal fluid (CSF), brain tissue biopsy. Etiotropic treatment with acyclovir is prescribed in herpetic encephalitis, in other cases supportive therapy is used.

Key words: encephalitis in children, treatment, clinic-diagnostics.

Introduction. Among all infectious diseases in children, neuroinfections, which usually manifest themselves with encephalitis, account for 3-5%. The disease occurs in patients of any age, in modern neonatology, cases of intrauterine cerebral inflammation are not uncommon. There are no sex differences among those who fall ill. The situation is complicated by the fact that typical childhood infections, such as chicken pox and measles, under unfavorable conditions give complications in the form of encephalitis.

Introduction. The main etiologic factor of the disease is infection of children with neurotropic viruses (arboviruses, enteroviruses, herpesviruses). In schoolchildren among the causes of encephalitis the specific weight of exanthematous infections (rubella, measles, chickenpox) increases, which is due to close interaction in the collective and high contagiousness of these pathogens. Symptoms of encephalitis can occur under the influence of such factors as:

Bacterial infection. Brain lesions occur with syphilis (more often congenital), generalized streptococcal or staphylococcal infection, which is characteristic of children with an aggravated heredity or reduced immunity. Encephalitis occurs with protozoal infections: malaria, toxoplasmosis.

Vaccination. There is a risk of inflammation of the nervous tissue after DPT, administration of an antirabic vaccine. The condition is typical for children aged 3-7 years. It appears 1-2 weeks after vaccination. In 70% of cases, mild forms with rapid independent recovery of neurological functions are observed.

Tumors. Encephalitis sometimes occurs with disorders of the immune system and the formation of autoantibodies against the background of malignant neoplasms. The condition is called a paraneoplastic process. In addition to damage to the brain, in sick children, multi-organ disorders are noted.

In the affected part of the brain in children, acute or subacute inflammation develops, which is accompanied by swelling of tissues. Under the toxic influence of decay products of viruses and biologically active substances, capillary permeability increases, resulting in petechial hemorrhages. Such pathologic changes cause general cerebral symptoms of encephalitis.

Viruses have a direct pathogenic effect on neurons, they provoke cell death or the appearance of inclusions in the cytoplasm, which disrupt the formation of neurotransmitters and impulse transmission. At the same time, focal symptoms of damage are determined, which depend on the localization of the defect. In rare cases the disease ends with cerebral hemorrhagic necrosis.

Purpose of the study: to investigate the efficacy of ozonated neuroprotectors in the complex treatment of encephalitis sequelae in children.

Materials and methods of research. To solve the set goal, we examined 58 children diagnosed with encephalitis at the age of 8 to 14 years. Of these, 19 (32.7%) were girls and 39 (67.3%) were boys. The average age of children with encephalitis was 9.2+0.2 years.

All children underwent in-depth assessment of clinical and neurological status according to the generally accepted scheme. The diagnosis was confirmed by the study of the general blood analysis, as well as by the results of magnetic resonance imaging. In the blood there was an increase in COE and leukocytosis with a shift to the left.

Results and their discussion. According to the results of anamnesis and clinical and neurological data, primary encephalitis was detected in 12 cases (20.7%). The most frequent etiologic factors of primary encephalitis were herpetic and adenovirus infections (7 cases - 58.3%). Secondary encephalitis was diagnosed in 46 observed patients (75% and most often developed after respiratory viral infections, less often pneumonia: 14 cases - 30,4%). In 3 cases, encephalitis developed after receiving a vaccine (6.5%).

When studying the clinical and neurological status, the predominant brain lesion was the development of pathologic process in 30 patients (62.5%). Spastic hemiparesis and hemianesthesia were noted. In 18 cases of suddenly developed inflammatory process (60%) muscle tone in legs and arms remained low for 6.1+0.2 days.

In 9 patients (15.5%) encephalitis developed in the cerebral hemispheres, of which frontal process in 8 (13.8%) patients, in total lesion - 5 cases (8.6%). In 7 (12.1%) patients encephalitis in the frontal-parietal part of the brain was characterized by spastic tetraplegia, mental disorders (frontal symptomatology) in 2 patients by epileptic convulsions. Sensory disorders in the form of hemihypesthesia were central in nature. Visual agnosia developed in brain lesions on the occipital region.

In 8 cases the pathologic process (13.8%) developed with lesion of temporal region, in 2 patients auditory agnosia and tinnitus developed (3.4%). The combination of clinical picture of encephalitis with cranial-cerebral nerve damage was revealed in 23 cases (39.7%).

In the course of treatment, all patients were divided into two groups. Group I consisted of 31 children whose therapy included broad-spectrum antibiotics, glucocorticoid hormones according to the scheme, nootropic drugs and B vitamins (group I - 53.4%).

Group II consisted of 27 patients (46.6%), whose treatment regimen included intravenous administration of ozonized neuroprotectors along with traditional methods. Special attention in all cases was paid to prevention of paresis, pararalysis and psychic phenomena development.

Group II patients received daily infusions of 5 ml of ozonized cerebrolysin for 13-15 days depending on the severity of the condition.

Quantitative assessment of clinical efficacy of intravenous infusion of ozonized cerebrolysin in complex therapy of encephalitis allowed to reveal a significant improvement of the condition in group II. In group I patients receiving conventional treatment, the condition was assessed before treatment as severe in 16 cases (51.6%), moderately severe in 11 cases (35.5%), and relatively satisfactory in 4 cases (12.9%). In group II, the condition before treatment was diagnosed as severe in 13 patients (46.4%), moderately severe in 11 (39.3%), and relatively satisfactory in 4 (14.3%). In general, a good clinical effect was characterized by significant regression of neurological symptoms or complete recovery of lost functions in the dynamics of clinical trials by week 3. It was observed in 5 patients (16.1%) of group I, who received baseline therapy, and in 9 (32.1%) patients of group II, who along with a standardized set of drugs received intravenous administration of ozonated neuroprotectors.

Satisfactory effect was characterized by a decrease in neurological symptomatology (spastic hemiparesis, aphasia, cognitive impairment). It was observed in 38.7% (n=12) of group I patients, and in 15 (53.5%) patients of group II.

Unsatisfactory effect was characterized by the absence of dynamics in the neurological status. In 14 (45.1%) patients of group I spastic hemipareses, lagging of speech and mental development persisted, and in 4 (14.3%) patients treated with the use of ozonated neuroprotectants along with traditional methods of treatment. Intravenous administration of ozonated neuroprotectants reduced treatment time by 31.3% compared to the group of patients who received traditional therapy.

Diagnosis of the focus of damage in encephalitis with the help of neuroimaging methods is not very difficult, but computer and magnetic resonance imaging have different sensitivity and specificity. At the present stage of its development MRI of the brain allows to determine the nature, localization and size of the inflammatory focus within five days and only in a number of cases several hours after the onset only by indirect signs (smoothing of furrows, loss of ribbed appearance of islet lobe cortex, disturbance of gray and white matter differentiation at the level of cortex and subcortical nuclei, symptom of linear hyperdensities, etc.).

In group I, 15 (48.4%) patients underwent MRI study before and after the treatment. The MRI picture showed atrophy of the brain substance, ventriculomegaly, scarring process. After the treatment (1 year later) this patient underwent another MRI. On MRI, the dilated lateral ventricles decreased several times, but atrophy and scarring remained (Figure 1.).

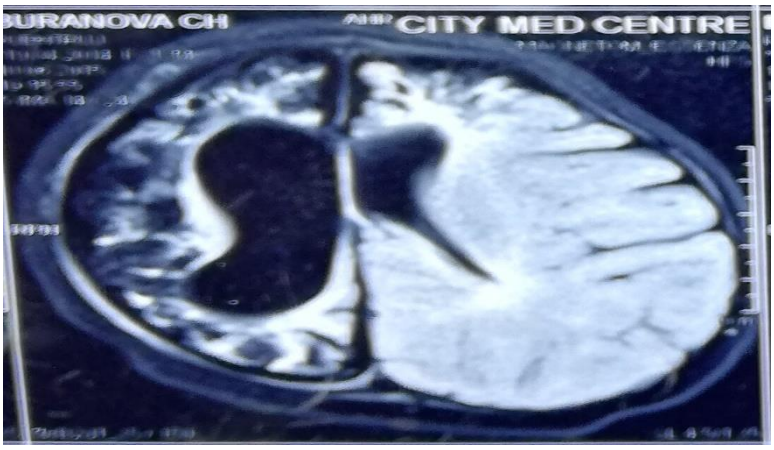

Figure 1. MRI of Patient K. Dilated lateral ventricles are seen which have shrunk several times, but atrophy and scar process persisted.

In group II, 13 patients (48.1%) 3 years after encephalitis recrudescence MRI study was performed: the picture showed ventriculomegaly, foci of encephalomalacia, scar process and atrophy of the brain substance

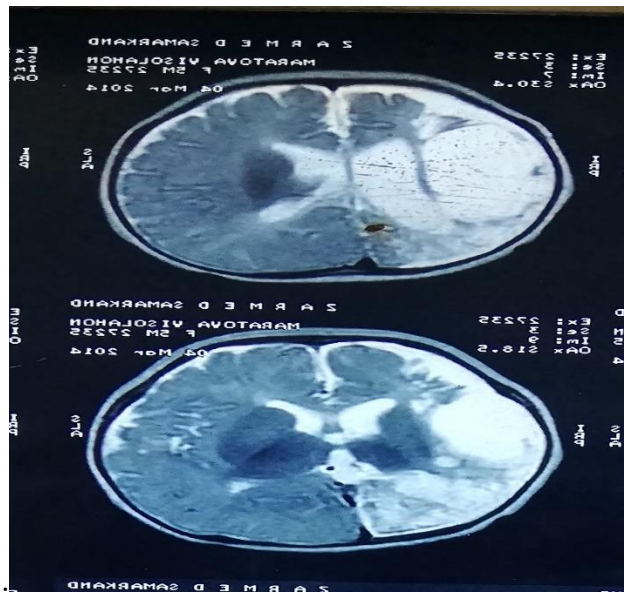

Figure 2. Repeat MRI study. Which revealed moderate ventriculomegaly and atrophy of brain substance, no encephalomalacia detected, scar area reduced.

After 2 years, the same patient underwent repeated MRI examination and was found to have: moderate ventriculomegaly and atrophy of the brain substance, no encephalomalacia was found, the scar area was reduced.

Conclusions: Thus, the conducted clinical and neurological comparative analysis showed that the use of ozonated neuroprotectants is an effective treatment method in the complex therapy of encephalitis sequelae. Under the influence of intravenous administration of ozonized neuroprotectors, the general condition of patients improves; significant regression or complete restoration of the lost functions of the central nervous system is noted.

The use of intravenous administration of ozonated cerebrolysin is pathogenetically justified, because the established immunomodulatory, detoxifying (bactericidal, viricidal, fungicidal), metabolizing effect of this method enhances neuroprotective and neurotrophic effects of baseline drugs, which eventually improves the clinical picture of encephalitis manifestations.

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