THE IMPORTANCE OF NEUROSONOGRAPHY IN ASSESSING THE SEVERITY OF HYPOXIC-ISCHEMIC ENCEPHALOPATHY IN NEWBORNS

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Annotation.

Neurosonography (NSG) is currently the primary screening method of research, due to its ease of implementation and relative availability.Neurosonography is a method of two-dimensional ultrasound examination of the anatomical structures of the brain, which uses the property of sound to be reflected from the boundaries of tissue structures. Acoustic windows: large and small fontanelles, defects in the bones of the skull, enlarged sutures, foramen magnum in newborns. The method is non-invasive, does not require preliminary preparation and allows tracing the dynamics of the pathological process in real time. The image is presented on the monitor screen in the form of signals of hyper- and hypoechoic density. The method is used for prenatal and postnatal diagnostics of cerebral malformations; hypoxic-ischemic, hemorrhagic, traumatic and inflammatory brain injuries and their consequences; tumors, ventriculomegaly. A sign of cerebral ischemia is the presence of diffuse hyperechoic foci, more often in the periventricular region, expansion of the interhemispheric groove, subarachnoid spaces, symmetrical expansion of the ventricular system. Intraventricular hemorrhage (IVH) and parenchymal - hyperechoic formations with clear contours, located intraventricular, subcortical or cortical.It is of great diagnostic value in assessing the severity of DIE in newborns. The greatest diagnostic value of NSH is manifested in the diagnosis of congenital malformations of the central nervous system, internal hydrocephalus, periventricular hemorrhage, periventricular leukomalacia at the stage of cyst formation. To a large extent, the specificity and reliability of the information received depends on the quality of the equipment and the experience of the physician-researcher. The timing of the study is of no small importance, since some variants of damage to the central nervous system of newborns (such as the formation of cysts) can most accurately be diagnosed by the end of 2-3 weeks. life. About 20% of negative results of NSH can be explained by this. Despite the widespread use of NSH, the results of researchers are not unambiguous,

Purpose of work:

Determination of the nature of neurosographic data in newborns with hypoxic-ischemic encephalopathy.

Materials and methods :

A study was conducted in 24 full-term infants with signs of DIE according to anamnestic, clinical and paraclinical data. All children were examined on the 3rd, 5-7,14-16 days of life.

Research results:

The overall frequency of neurosonographic changes in newborns with DIE was 55.60-3.27%. The predominant symptom in the early neonatal period was a local increase in echogenicity, the frequency of which significantly decreased by the end of the first week of life. The neurosonographic picture had a certain staging in the dynamics of the neonatal period, which allowed to identify in newborns with moderate HIE 2 NSH variants of its course. First; local increase in echogenicity - expansion of the interhemispheric groove. The latter could indicate the presence of atrophic changes in the brain tissue. The presence of this variant could be determined in 24 newborns who had changes in NSH- pictures.

The second option; a local increase in echogenicity - an increase in the echogenicity of the choroidal plexuses - a moderate increase in the lateral ventricles, subarachnoid space. This option was more common in 24 children who had neurosonographic changes.

The advantages of ultrasound methods in examining the brain in children of the first year of life are obvious. Non-invasiveness, absence of radiation exposure, and the possibility of dynamic research put echography among the main diagnostic methods in perinatal neurology. No special training or anesthesia is required. Modern ultrasound methods make it possible to assess not only the structure of the brain, but also the state of cerebral blood flow. The severity of the state of the underlying disease is not a contraindication for neurosonography.

Characteristics of neurosonography data in newborns on the 5-7th day of life

Clinical syndromes	1st group	2nd group	Group 3
Periventricular edema	18 (90%)	16 (80%)	13 (65%)
IVH of 1 degree	5 (25%)	3 (15%)	2 (10%)
IVH of the 2nd degree	3 (15%)	2 (10%)	fifteen%)
Dilation of the lateral ventricles	5 (25%)	4 (20%)	3 (15%)

Periventricular cerebral edema, which occurs as a result of intrauterine or intrapartum hypoxia, was found much more often among others in all examined children. In all comparison groups, both full-term and premature infants, periventricular edema was observed with approximately the same frequency. There was no significant difference between the groups.

Dilation of the lateral ventricles, as a manifestation of hypertensive syndrome, was detected both in full-term newborns - 15%, and in premature newborns of groups 1 and 2 (25% and 20%, respectively)

There were no children with signs of periventricular leukomalacia among the studied groups at the age of 5 - 7 days. In premature infants of groups 1 and 2, hemorrhagic changes in the NSH (IVH grade I and II) were more often recorded compared with full-term infants.

Thus, in the early neonatal period in newborns with DIE, according to the ultrasound examination of the brain, dilatation of the lateral ventricles and the phenomenon of periventricular cerebral edema are quite often revealed, which indicates a deep degree of CNS damage in newborns of this group. Hypoxic-hemorrhagic lesions of the central nervous system were significantly more frequent in premature infants. At the age of one month in newborns with HIE, various changes in the structure of the brain persisted. According to the NSG, there was a significant decrease in the incidence of periventricular edema over time, but it still persisted in 40% of children in group 1 of full-term infants, in 30% of children born with a gestational age of 32-37 weeks, and in 20% of full-term infants. This indicator of hypoxic-ischemic damage to the central nervous system decreased by almost 2-3 times ($p < 0.01$) compared with the early neonatal period in all observation groups. Subependymal cysts according to the ultrasound examination of the brain, in most cases as a consequence of the transferred intraventricular hemorrhage, were recorded only in premature infants 5% and 10%, respectively, in groups 1 and 2. Dilation of the lateral ventricles in newborns at 1 month was noted less often in all observation groups than in the early neonatal period (15%, 10% and 5%, respectively, in groups 1, 2 and 3). It was also noted that the number of premature newborns in the

neonatal period who did not have pathological changes on neurosonography was significantly (p <0.05) less than in the comparison group, where normal neurosonogram indices were detected in almost half of the examined newborns, 10% and 15% in the prematurity groups, versus 40% in the full-term newborns group. Hypoxic hemorrhagic lesions of the central nervous system (IVH grade I) at the end of the neonatal period were diagnosed in children 15% and 10% of 1 and 2 groups, respectively. 1 full-term newborn from the comparison group also had grade I IVH. The results obtained indicate that in premature infants with DIE, gross structural changes in the brain according to ultrasound (PVR, IVH) persist longer.) at the end of the neonatal period, 15% and 10% of groups 1 and 2 were diagnosed in children, respectively. 1 full-term newborn from the comparison group also had grade I IVH. The results obtained indicate that in premature infants with DIE, gross structural changes in the brain according to ultrasound (PVO, IVH) persist longer.) at the end of the neonatal period, 15% and 10% of groups 1 and 2 were diagnosed in children, respectively. 1 full-term newborn from the comparison group also had grade I IVH. The results obtained indicate that in premature infants with DIE, gross structural changes in the brain according to ultrasound (PVO, IVH) persist longer.

At the age of 3 months, during neurosonography, it was noted that in the group of full-term newborns, most children did not have pathological changes (65%), while in the groups of premature babies, their number was much less than 25% and 35%, respectively (P <0.05). the incidence of lateral ventricular dilatations also decreased compared to the age of 1 month, but had no confidence limits. Subpependymal cysts persisted in 5% of premature infants of group 1 and 10% of premature infants of group 2 of the study.

Conclusions:

Deviations from the norm in the neurosonographic picture are observed in 55% of newborns with moderate hypoxic-ischemic encephalopathy.

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