NEUROLOGICAL STATUS OF CHILDREN WITH INTRAUTERINE DEVELOPMENTAL DELAY

Jo'rayev Shaxzod Shavkatovich[1]
Djalilova Zarnigor Obidovna[2]
[1-2]Bukhara State Medical Institute named after Abu Ali ibn Sino
Email: zarnigor.djalilova@bsmi.uz
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Annotation: The article presents a comprehensive follow-up clinical and laboratory examination of 55 newborns with IUGR with a gestational age of 24 to 34 weeks. In children with IUGR in neurological status marked cognitive and sensory impairments, with the characteristic presence of pyramidal signs and delay rate of motor development, which progressed with age. Very often it recorded progressive lag in mental and speech development (85.7%). The frequency of cerebral palsy in this category of children was 15.2%. A direct link of adverse physical and neurological outcome in children with IUGR at birth with critical states early neonatal period.

Keywords: preterm infants, intrauterine growth retardation, neurological disorders.

The period of early childhood - from birth to the age of three - is very important in a child's life. This is the most intensive period of motor, mental, social and emotional development, the formation of hearing, vision, speech, self-service skills. How successful the development of the child's functions at this age will be depends largely on how he will be adapted in a peer group, whether he will be able to study at school, acquire professional skills [1, 2]. At the same time, this is the most vulnerable period of childhood. Biological risk factors (prematurity, low birth weight, hereditary and congenital diseases), chronic diseases, social environment, and the presence or absence of parental education have a significant impact on the development of a child [3, 4]. Therefore, certain deviations in the development of the child may be the result of problems with health and / or conditions of education, both explicit and hidden, not yet identified [5]. Premature infants who underwent intensive care and resuscitation in the neonatal period have a number of developmental features in the first year of life, which must be taken into account when planning further rehabilitation [3, 6–8]. However, at present there is a significant gap between high technologies for nursing premature babies in specialized hospitals, their follow-up and rehabilitation in the outpatient network [9, 10]. The lack of continuity, a unified evidence-based approach to the management of such patients often leads to the appointment of diametrically opposed treatment and rehabilitation regimens [11, 12].

Premature infants, whose anamnesis is aggravated by perinatal cerebral pathology, constitute the main risk group for the development of early childhood disability, impaired psychomotor development, which subsequently leads to social exclusion [13–15]. The purpose of this study. There was a study of the catamnesis of children with intrauterine growth retardation (IUGR).

Materials and methods. A follow-up comprehensive clinical and laboratory examination of 55 newborns with IUGR was carried out for 2 years. The catamnesis of the examined children was carried out on the basis of the study of outpatient records. Children were divided into 2 groups depending on the gestational age: 27–31 (n=14) and 31–34 (n=41) weeks. Psychomotor status was determined according to the methodological recommendations "Child growth and development" (2006) among 33 children with IUGR. For a comparative

analysis of the psychomotor status in children with IUGR, a group of 20 practically healthy children aged from 1 month to 2 years was selected.

Results and discussion. We observed 55 newborns with gestational age from 24 to 34 weeks, body weight from 925 to 1560 grams at birth. Children were transferred from maternity hospitals on the 20th–25th (21.97±2.3) days of life, the duration of treatment varied from 46 to 60 (56.36±1.1) days. An analysis of the antenatal development of the examined children showed that all mothers had a complicated course of pregnancy and childbirth. Based on the examination and treatment, the following clinical diagnoses were made for the children (Table 2). In 11 children (20%), the main pathology was complicated: mixed hydrocephalus - 6 (10.9%), formation of cysts in the periventricular region - 3 (5.5%), bronchopulmonary dysplasia - 2 (3.6%). In addition to the underlying disease, 34.7% of newborns in the study group had concomitant pathology: retinopathy of prematurity of I–II degree - 4 (7.2%), inguinal and umbilical hernias - 2 (3.6%), anemia of prematurity - 45 (88 .2%), rickets of prematurity - 28 (50.9%).

Complications of the underlying disease and concomitant pathology worsened the general condition of the children, had a negative impact on the duration of treatment and prognosis. When assessing the neurological status in most newborns, the syndrome of depression of the central nervous system dominated - 32 (58.2%) and further (in descending order): hyperexcitability syndrome - 10 (20%), hypertensive hydrocephalus - 7 (12.7%), convulsive syndromes - 6 (10.9%). A combination of syndromes was observed in 7.25% of the examined patients. Neurosonography revealed structural changes in the periventricular zone, the ventricular system of the brain, and white matter in 25 children (49%): intraventricular hemorrhages (IVH) of grade I in 10 (40%), grade II in 5 (20%), Grade III - in 6 (24%), Grade IV - in 3 (12%), periventricular cysts were detected in 3 (12%), periventricular leukomalacia (PVL) - in 2 (8%), porencephaly - in 3 (12%)).

In 3 (12%) of the examined children, the lesion was bilateral, in 4 (16%) there was a combination of a violation of the structure of the brain tissue (PVL, periventricular cysts, etc.) and hemorrhagic lesions (IVH) of varying degrees. In 6 children (12%), due to IVH and PVL transferred in the neonatal period, cerebral palsy developed.

The data obtained are consistent with the world literature, in which the described frequency of adverse neurological outcomes in severe hemorrhages and PVL in surviving children ranges from 38 to 74% [19, 20]. An unfavorable outcome is sensorineural hearing loss detected in one child. The causes of impaired auditory analyzer are multifactorial. First of all, this is the morphofunctional immaturity of very preterm infants in combination with ischemic lesions of the central nervous system, acoustic trauma, and hyperbilirubinemia [20]. Five children (10%) have a delay in the pace of physical, psychomotor and speech development, 8 (16%) - a delay in speech and motor development, 3 (6%) - early childhood nervousness, 1 (2%) - subclinical hypothyroidism. Every third child has low rates of neuropsychic and physical development. By the 1st year of actual life, indicators of body weight, length and head circumference are in the categories of "low" and "very low" levels when assessed by the sigma method.

The average parameters of physical indicators in the group of examined children ranged from -2 to -3 SD. 24 children (48%) do not have deviations in the neurological status or are removed from the register of a neurologist under the age of 2 years. The study of psychomotor function in 33 children with IUGR showed that in the main group there were

significantly fewer children (P<0.001) who kept their heads in a vertical position compared to the control (Table 3) under the age of 3 months. In children older than 3 months, this figure was 72.7±7.5%. Among these children, head incontinence up to 6 months was recorded in 3.0±2.9% of cases. According to the methodological recommendations "Child growth and development" (2006), a child should sit without support already at the 6th month of life. In our observations, children of the main group in 63.6±8.4% of cases sit with support or do not sit at all (15.2±6.2%), which significantly differs from the indicators of the control group (P<0.01). The delay in the establishment of walking function was significant. At the age of up to 12 months, only 15.2±6.2% of children in the main group walked independently.

In the control group - 60±10.9% (P<0.01). At 15 months, 27.3±7.7% of children in the main group and 35±10.7% in the control group walked independently. 42.4±8.6% of children in the main group began to walk after 17 months (P<0.01). 15.2±6.2% of children of this age in the main group were not able to keep the body in balance and control their forward steps. In the study of muscle tone in 57.6% of children with IUGR, hypertonicity was noted, indicating damage to the pyramidal system. Hyperkinesis amounted to 15.2%. Convulsive paroxysms occurred in 15 (45.5%) children, subsequently vascular epilepsy developed in 6 children. The study of psychoverbal development showed a lag in 69.7% of children with IUGR. Disturbances were manifested by a reduced reaction to the voice (69.7%), lack of oral attention (36.4%), poor sound components of cooing and babbling (24.2%), delayed speech formation (39.4%), pronunciation of individual simple words (81.8%).

There was a delay in the "revival" complex, visual concentration on faces, toys, recognition of relatives and strangers, emotional lability, motor disinhibition. Thus, as a result of the clinical examination, it was revealed that pregnancy and childbirth in all mothers of the study group of children proceeded with complications. 89.1% of children were born in asphyxia, so the symptoms of central nervous system damage, caused by both infectious and non-infectious pathologies, dominated in the clinic. Complications of the underlying disease (20%), such as mixed hydrocephalus, cysts in the periventricular region (cystic form of PVL), bronchopulmonary dysplasia, and comorbidities worsened the general condition of the children and their neurological prognosis. IUGR in combination with intranatal asphyxia and an infectious component determine the complicated course of the early adaptation period. Developing respiratory and hemodynamic disorders, hypoxemia, acidosis become the main risk factors for severe cerebral damage with an unfavorable outcome.

A direct relationship has been established between adverse somatic and neurological outcomes in children with IUGR at birth and critical conditions in the early neonatal period. In children with IUGR, the neurological status has cognitive and sensory impairments with the characteristic presence of pyramidal signs and a delay in the pace of motor development, which progressed with age. Very often, a progressive lag in psychoverbal development is recorded (85.7%). The incidence of cerebral palsy in this category of children was 15.2%.

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