

**PEDIATRICS**

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# PSYCHOLOGICAL ASPECTS IN TREATMENT AND CARE FOR NEWBORNS WITH HYPOXIC-ISCHEMIC ENCEPHALOPATHY AT THE ACUTE STAGE OF DISEASE

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**Abstract:** the article presents the experience of using medical-psychological aspects of treatment of hypoxic-ischemic encephalopathy in newborns in acute period of the disease. The elements of early influence on the development of the child's psychomotor activity were used on the basis of modern medical technology of treatment. These elements included sensor stimulation: (vestibular, proprioceptor, tactile), development of motility, hearing and sight perception. The study showed positive changes in neurological symptoms in children, resulting in a reduced duration of the hospital stay.

**KeyWords:** newborn, hypoxic-ischemic encephalopathy, medical-psychological treatment.

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## INTRODUCTION

Hypoxic-ischemic impairment of the nervous system, namely hypoxic-ischemic encephalopathy in newborns remains to be one of the serious medical and social problems due to high incidence, severity and unfavorable impact on further development of children [1, 2, 3, 6]. Deficient contact of newborn with mother during hospital stay after delivery has negative influence on adaptation, emotional and psychophysical condition and reduces effectivity of rehabilitation measures [8, 15, 19, 20].

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## 2 PURPOSES, SUBJECTS AND METHODS:

**2.1 Purpose** of the study was to improve non-invasive treatment of hypoxic-ischemic encephalopathy in newborns, to improve the elements of early influence on the development of their psychomotor activity by increasing participation of mothers in the process of management.

### **2.2 Subjects & Methods**

The study was carried out in Kharkiv Regional Clinical Children Hospital No.1 at the Department of Neonatal Anesthesiology and Intensive Therapy and the Department of Neonatal Pathology. The study was conducted from January 2015 till June 2016. The study involved 297 newborns with hypoxic-ischemic encephalopathy, 91.8 % were observed at the Department of Neonatal Anesthesiology and Intensive Therapy and 68.4 % at the Department of Neonatal Pathology.

Inclusion criteria:

1. Full-term newborns with asphyxia at birth
2. Premature newborns at gestational age of not less than 32 weeks with asphyxia at birth

Exclusion criteria:

1. Manifestations of infection
2. Congenital defects of development

Patients were divided into 2 groups according to the age of gestation, namely 177 full-term newborns and 120 preterm newborns.

Examination of newborns comprised clinical and laboratory-instrumental methods. Clinical examination was carried out with traditional methods of examination of newborns, assessment of condition of the nervous system implied determination of pathological symptoms and syndromes. Laboratory-instrumental examination included blood test, urinalysis, arterial blood gas test, electrolytes imbalance blood test, X-ray examination, ECG, ultrasound examination of the brain and internal organs, computed tomography. TORCH screen and the immunologic tests were made on an as-needed basis.

#### Conflict of interests

There is no conflict of interests.

### 3 RESULTS AND DISCUSSION

Assessment of mothers' health, duration of pregnancy and delivery showed impairments in 42.2 % of Group 1 mothers and 100 % of Group 2 mothers. Somatic pathology was observed in 45.2 % mothers of Group 1 newborns and 83.3 % mothers of Group 2 newborns. Gestational toxicosis and threat of preterm delivery were registered in 30.5 % mothers of Group 1 newborns and 100 % mothers of Group

All the newborns were born with asphyxia. General condition after birth was severe and complicated by neurological disorders and cardiorespiratory insufficiency. Due to severity of condition the newborns were transferred from maternity clinic to the Department of Neonatal Anesthesiology and Intensive Therapy of Kharkiv Regional Clinical Children Hospital No.1.

2 newborns. Chronic placental insufficiency and chronic intrauterine hypoxia of fetus were diagnosed in 49.5 % mothers of Group 1 newborns and 83.3% mothers of Group 2 newborns.

At admission to the hospital the condition of all the newborns remained severe due to depression of the nervous system, respiratory and cardiovascular insufficiency and metabolic disorders. Severe asphyxia was diagnosed in 59.9 % of newborns, moderate form in 40.1 % of Group 1 newborns, in 71.7 % and 29.3 % of Group 2 newborns.

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Sonography showed different signs of CNS involvement. They depended on the severity of CNS involvement, stage of maturity of newborns and periods of the disease. During the first days of the disease full-term newborns had a diffuse increase in echogenicity of the brain, compression of ventricles, decreased vessels pulsation, smooth pattern of convolutions and furrow.

Premature newborns had increased echogenicity in the periventricular zone, enlargement of the ventricles system of the brain, asymmetry of ventricles, compression of the choroidal plexus, cysts in periventricular zone. These sonography findings conform to the literature data [7, 16].

Taking into consideration medical history, clinical symptoms, severity of neurological disorders, laboratory and instrumental findings, hypoxic-ischemic encephalopathy was diagnosed in all the newborns. Symptoms of the central nervous suppression or hyperactivity, metabolic acidosis, hypoxic lesions of the heart and kidneys, and coagulation were diagnosed in 25 % of newborns.

Clinical neurological symptomatic and laboratory-instrumental findings gave information on abnormal processes in the brain (hypoxia, decreased blood circulation, edema of the brain) and were used for diagnosis of hypoxic-ischemic encephalopathy and administration of treatment.

The treatment was prescribed according to the current guidelines (13, 14, 16)

During the early neonatal period background therapy included oxygen therapy, magnesium sulfate, vitamin C, calcium gluconate. In increased neuroreflector activity the patients were administered Seduxen and Relanium. Vitamins B<sub>6</sub>, B<sub>12</sub> and nootropics were used in severe suppression of nervous system.

Psychological influence on the newborn with hypoxic-ischemic encephalopathy started from the first days of life. The advantage of this method bases on information represented in the medical literature on favorable action of psychological influence on parents and children in some severe diseases preceding the pathology under investigation (5, 9, 10, 11, 12, 17, 19).

Assessment of the interview with parents after delivery of children with severe asphyxia showed high incidence (78 %) of depression in parents resulting from uncertainty of parents in favorable outcome of the disease, possible consequence such as retardation of psychomotor development, the ability to receive education and choose a profession. In these circumstances physicians had to provide a qualified and non-biased explanation of the disease pathogenesis, options for diagnosis and treatment of this disorder, measures for prevention of possible complications and comments on the importance of a qualified follow-up after the neonatal period.

Our study showed the importance of participation of parents in care for children at early stages of hypoxic-ischemic encephalopathy.

Parents were permitted to visit children in the intensive care department, to take their newborn in the arms, to take part in carrying out certain procedures of care. The staff of the department pointed out positive changes in the children's condition.

After improvement of the condition the newborns were transferred to the department of neonatal pathology, where they stayed together with mother.

The ward for joint stay of the newborns with their mothers had sufficient space and equipment necessary to maintain sanitation and epidemiological regime.

In these conditions early non-invasive influence on the child's development was conducted in combination with medical treatment. Non-invasive methods were based on stimulation of the children's sensor sensitivity.

Medical staff of the neonatal department instructed mothers how to have the contact with the child, to give the child posture for psychological hypertonia of the flexor muscle, to fix the look, to fix the sound eruption

The common movement activity was stimulated for the development of vestibular, proprioceptive, tactive sensitivity, encouragement was done to such actions as the attempt to hold the head, to change the body position and practice to put the child on the abdomen was used. Massage of the hands and fingers was used for stimulation of fine movements.

The demonstration of bright objects stimulated the sight perception. It was recommended to speak with a child for stimulation of sound perception. Musical influence by classical music was used for 3-4 hours per day at the department.

Medical staff of neonatal department thoroughly inspected the mothers' care for newborns, provided corrections, and pointed out successful results, such as an increase in spontaneous motility, improvement of muscular tone, activation of congenital reflexes.

In normal epidemiological situation and favorable weather the mothers with newborns were permitted to walk in the hospital park and to meet with members of their family.

Physicians of the neonatal department consulted the mothers on care for children, rational feeding, advantages of natural feeding, prevention of diseases and importance of prophylactic vaccination. They were also given leaflets with information on care and feeding.

Effectivity of medico-psychological aspects of treat-

ment of newborns with hypoxic-ischemic encephalopathy was evaluated by comparing the results of the treatment of this population of patients in 2015 and 2005.

Groups of patients with severe forms of hypoxic-ischemic encephalopathy and moderate severity forms were selected in these two periods. Groups of newborns were similar by gestational age, body mass index, neurological symptoms and medication. The assessment showed that the term of stay in the hospital of patients with HIE decreased from  $38.3 \pm 5$  days in 2005 to  $20.7 \pm 4$  days in 2015. This fact gives reason to consider this method effective, which means it should be introduced into practice.

It is known that structural defects of the brain are manifested by essentially new neurological symptoms (16). They can include syndrome of an increased excitability of the nervous reflexes, hydrocephalic syndrome, convulsive syndrome, epileptic syndrome, syndrome of vegetative dysfunctions, syndrome movement disorders (spastic paresis, pyramidal insufficiency, pseudobulbar syndrome, muscular hypo- and hypertonia, syndrome of retardation of psychological and pre-speech development, cerebro-asthenic syndrome).

Before discharging the newborns from the hospital the parents should be consulted on management during restoration period. The child should undergo follow-up observation by pediatricians, neurologists, ophthalmologists and other specialists.

Assessment of psychomotor, social and emotional development of the child is a component of medical-psychological management of children with HIE. It involves consultations for parents, observation by neurologists, psychologists and other specialist; it is necessary for prognosis of further development, including speech and cognitive abilities.

## CONCLUSIONS

1. Combination of medical and psychological aspects of treatment promotes a decrease in duration of neurological disorders in newborns with hypoxic-ischemic encephalopathy.

2. Active participation of mothers in care and rehabilitation is effective in prevention of disorders and is the basis for formation for harmonic children-parents relationship.

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