THE STRUCTURE OF MORBIDITY IN PREMATURE INFANTS WITH AN ASYMMETRIC VARIANT OF INTRAUTERINE GROWTH RETARDATION IN THE NEONATAL PERIOD

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Abstract*. It was found that in the premature main group, diseases such as early sepsis and gastrointestinal diseases were significantly more common (P <0.001) than in premature infants of the comparison group. Among the diseases of the central nervous system, structural disorders of the brain in the form of periventricular leukomalacia were found only in the group of newborns with an asymmetric variant of intrauterine development delay. In children with intrauterine growth retardation, respiratory disorders were more often (P <0.001) due to congenital pneumonia.*

Keywords*: premature babies, intrauterine growth retardation, morbidity.*

To date, the problem of premature birth and the birth of children with intrauterine development delay remains urgent. Despite the high-tech treatment of women, there are no fewer cases of children with intrauterine growth retardation: on average, one in ten babies is born with low body weight [1,11].

The frequency of intrauterine development delay varies widely; according to foreign literature, 5-7% of children with intrauterine development delay in healthy mothers and up to 25% in mothers with a burdened history are identified [2,3], since intrauterine development delay is a universal fetal response to problems in the antenatal period [3,6].

According to Russian authors, there is an increase in the proportion of children with intrauterine development delay in premature infants, it can reach 60% [4,5]; about 23% of intrauterine development delay occurs among children with very low body weight and about 38% - with extremely low body weight [6]. It is necessary to clarify the frequency of intrauterine development delay in the group of premature infants born before the 28th week of gestation.

Children with low birth weight are at the highest risk of perinatal loss and disability in the future, and their adaptation period has its own characteristics and is complicated by the development of numerous pathological syndromes [3,7,8].

According to the literature, thermoregulation disorders are more common in children born small by the time of gestation [1], various metabolic disorders, including hypo- and hyperglycemia, electrolyte disorders, in particular phosphorus-calcium metabolism, as well as hypertriglyceridemia, hyperbilirubinemia [2,5,8]. In addition, children with intrauterine growth retardation have a high risk of developing perinatal asphyxia of varying severity [5,9,11].

Among diseases of the respiratory system, the risk of bronchopulmonary dysplasia (BPD) is increased [9.10], hemodynamically significant functioning arterial duct and congenital heart defects are more common in the structure of diseases of the cardiovascular system, dyskinesia and necrotizing enterocolitis (NEC) are more common among diseases of the gastrointestinal tract [5]. According to domestic research, children with intrauterine growth retardation are at risk of developing various infectious diseases [5].

The purpose of the study. To study the structure of neonatal morbidity in premature infants with an asymmetric variant of intrauterine development delay in the neonatal period.

Materials and methods of research. About 80 newborn children were examined at the neonatal pathology departments of the 5th Tashkent City Children's Hospital and at the Republican Perinatal Center. All newborns were divided into the following groups: 1. The main group consisted of 40 premature newborns with an asymmetric variant of intrauterine development delay 2. The comparison group consisted of 40 premature newborns without intrauterine development delay. Clinical, laboratory and instrumental research methods were carried out: neurosonography, radiography, ultrasound of the liver and gallbladder. Statistical processing of the obtained data was carried out using Microsoft Excel 2010, Statistica 6.1 software packages. Differences at the P< 0.05 level were considered statistically significant.

The results of the study. The general condition of a newborn child with intrauterine development delay in the neonatal period is often accompanied by various concomitant pathological conditions. We analyzed the morbidity of newborns with intrauterine growth retardation in the neonatal period (Table 1.).

Table 1.

Features of morbidity in the neonatal period in the study groups

Diseases	Main group n-40	Comparison group n-40
Early sepsis	10,0±4,1%**	2,5±2,1%
Diseases of the respiratory system	87,5±4,4%	75,0±4,2%
Gastrointestinal diseases	7,5±3,6%*	2,5±2,1%
Diseases of the central nervous system	72,5±6,1%	52,5±6,8%
Diseases of the cardiovascular system	47,5±5,1%	32,5±6,0

Note: *P<0.05; **P<0.001-the reliability of differences between groups.

The analysis of the morbidity structure showed that premature newborns with an asymmetric variant of intrauterine development delay were significantly more likely (P<0.001) to have diseases such as early sepsis in 10.0±4.1%, gastrointestinal tract diseases in 7.5±3.6% of cases than in premature infants without intrauterine development delay in 2.4±2.1%. Diseases of the respiratory system (87.5±4.4%) and diseases of the central nervous system (72.5±6.1%) were also 1.3 times more common in premature newborns of the main group than in children of the comparison group (75.0±4.2% and 52.5±5.8%).

The incidence of diseases of the cardiovascular system (open ductus arteriosus, heart failure, cardiac arrhythmia, hypertension, etc.) was 1.5 times higher in newborns with an asymmetric variant of intrauterine development delay, but there were no significant differences between these indicators. In connection with severe respiratory disorders in premature infants with intrauterine growth retardation, the frequency of open ductus arteriosus was analyzed. It turned out that an open ductus arteriosus was detected in 5 (12.5%) children of the main group and in 3 (7.5%) newborns of the comparison group, in all cases the ductus arteriosus was hemodynamically insignificant.

When analyzing the structure of diseases of the respiratory system in newborns, statistically significant differences were obtained in the incidence of congenital pneumonia, BPD and respiratory distress syndrome (Fig. 1).

Respiratory distress syndrome (RDS) in premature infants with an asymmetric variant of intrauterine development delay was diagnosed only in 17.5%, whereas in premature infants corresponding to gestational age, RDS was observed much more often - in 35.0% (P <0.05). In children with intrauterine development delay, respiratory disorders were more often caused by congenital pneumonia in 62.5% of cases, which was also noted in the comparison group - in 40.0% (P <0.001); transient tachypnea in 22.5% and 15%, respectively. More rare conditions were atelectasis of various localizations (10% in the main group and 15% in the comparison group), pneumothorax (noted only in the main group in 2.5% of cases).

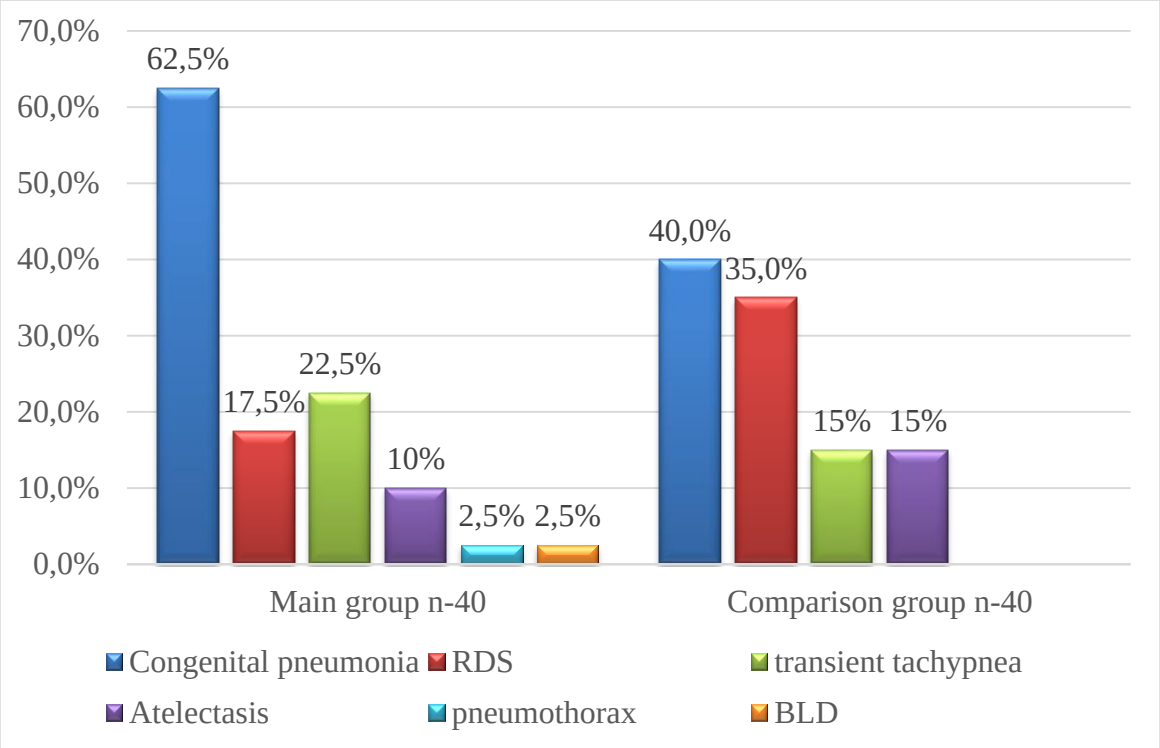

Fig.1. The structure of diseases of the respiratory system of newborns with intrauterine development delay and without intrauterine development delay.

Delayed fetal development, being a factor of lung underdevelopment, significantly increases the risk of developing BPD. The processes limiting the growth rate of the fetus also slow down the development and maturation of its lung tissue [16]. Deep morphofunctional immaturity of the lung tissue, characteristic of premature infants born earlier than 32 weeks of gestation, a long period of ventilation, congenital generalized infection and sepsis with intrauterine development delay were predisposing factors for the formation of bronchopulmonary dysplasia in 1 (2.5%) premature newborn with an asymmetric variant of intrauterine development delay.

We also analyzed the structure of diseases of the digestive system in premature newborns with intrauterine development delay and without intrauterine development delay (Fig.2.).

When analyzing the structure of diseases of the digestive system in newborns, statistically significant differences were obtained in the incidence of necrotizing enterocolitis. The proportion of necrotizing enterocolitis that does not require surgical intervention (children with surgical pathology were excluded from the study) was significantly higher (P 0.05) in the group of newborns with intrauterine development delay and amounted to 15.0% versus 5.0% in the

comparison group. Gastrointestinal dyskinesia phenomena (enteral feeding intolerance, bloating, sluggish intestinal motility) were observed in 27.5% of children with intrauterine development delay and in 32.5% of children without intrauterine development delay. Neonatal cholestasis was diagnosed in 27.5% of the main group and 12.5% in the comparison group (P 0.05).

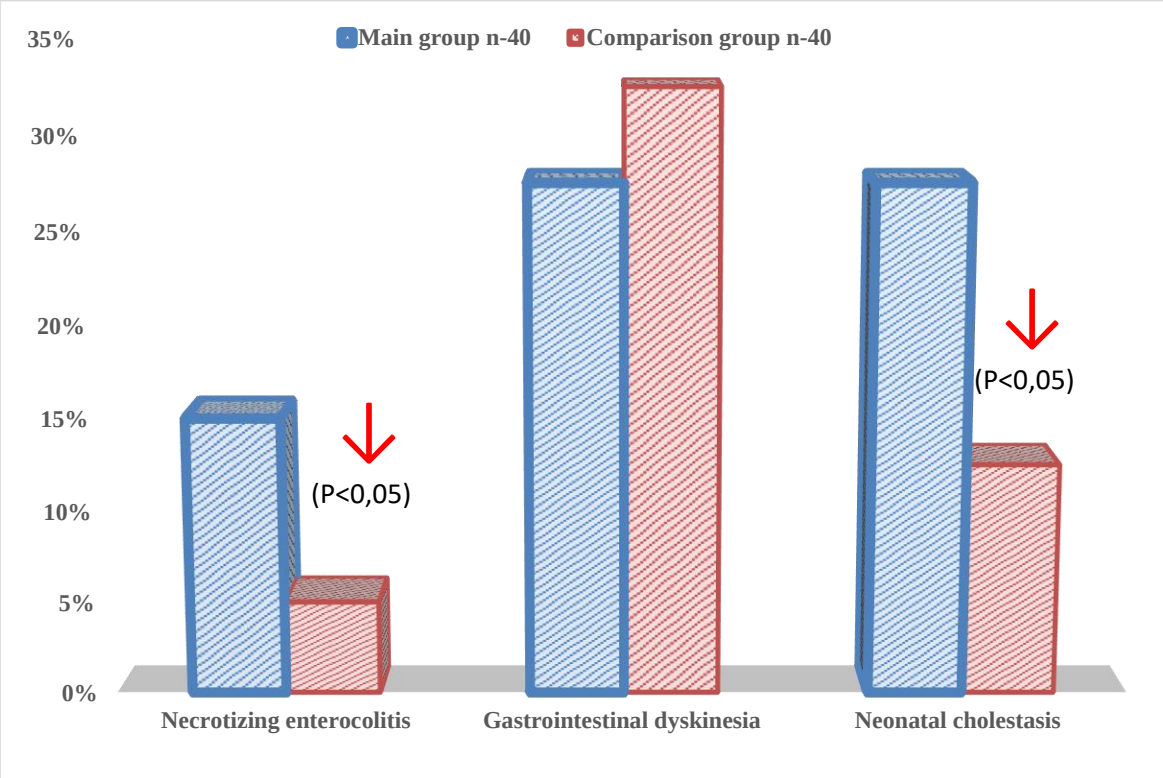

Fig.2. The structure of diseases of the digestive system in newborns with intrauterine development delay and without intrauterine development delay.

We also analyzed the structure of diseases of the central nervous system in the examined newborns (Fig.3.).

Hypoxic-ischemic damage of the central nervous system was observed in almost all studied premature newborns, in 80% of newborns in the main group, and in 75% of cases in the comparison group. Premature newborns with intrauterine growth retardation were diagnosed with perinatal encephalopathy in 41% of cases, and cerebral ischemia in 39%.

Among the syndromes of the acute period, the syndrome of general depression was most common – 70%, as well as the syndrome of vegeto-visceral dysfunctions – 50%, these syndromes were more common in premature newborns with intrauterine development delay.

The conducted neurosonography showed that periventricular leukomalacia (PVL) occurred in 2 (5%) premature infants with intrauterine development delay, this pathology was not detected in the comparison group.

Pseudocysts were 2 times more common in the group of children of the main group, and intraventricular hemorrhages (IVF) were 1.3 times more common in premature newborns of the comparison group (22.5% and 17.5%, respectively).

It follows from this that hypoxic damage to the central nervous system and the resulting syndromes in newborns of both groups occurred in almost equal numbers and had no significant differences. The influence of intrauterine hypoxia and immaturity led to structural disorders of the brain of newborns with an asymmetric variant of intrauterine development delay in the form of

periventricular leukomalacia in 5% of cases, which was not detected in the group of premature infants corresponding to gestational age.

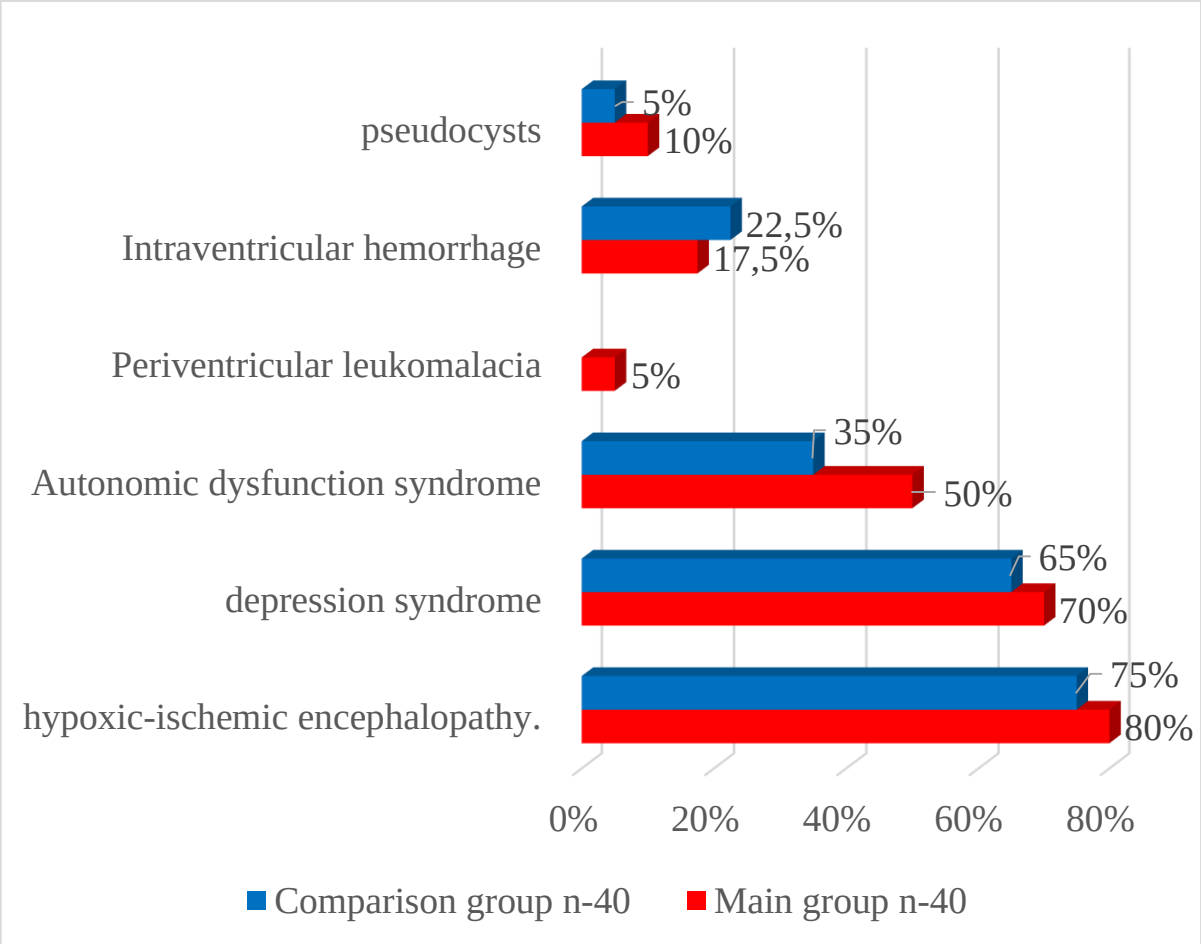

Fig.3. The structure of diseases of the central nervous system in newborns with intrauterine development delay and without intrauterine development delay.

Conclusions. Thus, it was found that premature infants with an asymmetric variant of intrauterine growth retardation were significantly more likely (P<0.001) to have diseases such as early sepsis and gastrointestinal diseases than premature infants of the comparison group. Among the diseases of the central nervous system, structural disorders of the brain in the form of periventricular leukomalacia were found only in the group of newborns with an asymmetric variant of intrauterine development delay. In children with intrauterine growth retardation, respiratory disorders were more often (P<0.001) due to congenital pneumonia.

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