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ПАТТЕРНЫ ЗАБОЛЕВАЕМОСТИ И КЛИНИЧЕСКИЕ ИСХОДЫ ГЛУБОКОНЕДОНОШЕННЫХ НОВОРОЖДЁННЫХ

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Резюме,

Глубоконедоношенные новорождённые характеризуются высокой частотой заболеваемости и неблагоприятных клинических исходов, обусловленных незрелостью органов и систем и воздействием перинатальных факторов риска. Анализ ретроспективных данных преждевременных родов в сроках 22,0–27,0 недель гестации показал доминирование поражений центральной нервной системы, бронхолёгочной дисплазии, ретинопатии недоношенных и нарушений психомоторного развития. Катамнестическое наблюдение в течение первого года жизни выявило высокий уровень инвалидизации, задержки моторного и физического развития, а также сохраняющуюся соматическую и респираторную заболеваемость.

Полученные результаты свидетельствуют о формировании устойчивых паттернов заболеваемости у глубоконедоношенных детей и подчёркивают необходимость раннего мультидисциплинарного наблюдения, своевременной реабилитации и персонифицированного подхода к ведению данной группы пациентов.

Ключевые слова: *недоношенные, экстремально маловесные дети, катамнез, паттерны*

MORBIDITY PATTERNS AND CLINICAL OUTCOMES OF PREMATURE NEWBORNS

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Abstract

Extremely premature newborns are characterised by a high incidence of morbidity and adverse clinical outcomes due to the immaturity of organs and systems and the impact of perinatal risk factors. Analysis of retrospective data on premature births at 22.0–27.0 weeks of gestation showed a predominance of central nervous system lesions, bronchopulmonary dysplasia, retinopathy of prematurity, and psychomotor development disorders. Follow-up observation during the first year of life revealed a high level of disability, delayed motor and physical development, and persistent somatic and respiratory morbidity.

The results obtained indicate the formation of stable patterns of morbidity in extremely premature infants and emphasise the need for early multidisciplinary observation, timely rehabilitation, and a personalised approach to the management of this group of patients.

Keywords: *premature, extremely low birth weight infants, follow-up, patterns*

Relevance

In recent years, thanks to advances in obstetrics, neonatology, and intensive care, the survival rate of extremely premature infants with very low birth weight (VLBW) and extremely low birth weight (ELBW) has increased significantly [1, 8]. Prematurity and perinatal CNS damage largely determine the further development and health of children. Children born weighing less than 1500 g at the age of 1 year are characterised by a high incidence of acute morbidity, somatic pathology, the formation of consequences of perinatal CNS damage and disability,

a large number of health disorders, low body weight and length indicators, frequent deviations in physical development in the form of short stature, underweight, and a combination of both, large increases in weight and length, a high frequency of profound and complex neuropsychological developmental delays caused by delayed motor development, active and comprehensible speech, and skills in the first year of life, and an average age of neuropsychological development that is lower than the adjusted age [3-6] .

Today, caring for children with a birth weight (BW) of less than 1,000 g is one of the most difficult medical and organisational problems. Improvements in neonatal resuscitation methods and principles of caring for extremely premature newborns have led to a 37% decrease in early neonatal mortality in Russia by 2019 in the group of children with extremely low birth weight (ELBW), and the survival rate is increasing every year. Thus, in obstetric hospitals in the Russian Federation, the survival rate of extremely low birth weight newborns in the 500-749 g weight group is 299.4 (per 1,000 live births), and in the group of children with MT 750-999 g - 551.3 (per 1,000 live births) [2, 5, 6]. Due to extreme prematurity, 50% of newborns are diagnosed with severe neurological diseases, including cerebral palsy, visual impairment (blindness), hearing impairment (deafness), and severe respiratory disorders [1, 7, 11].

Premature babies with extremely low birth weight have a number of anatomical and physiological characteristics that must be taken into account in the daily care of this group of children. Most babies with low birth weight (less than 2500 g) are premature babies born at 24–30 weeks of gestation (71.3%), while the rest are premature and full-term babies with a body weight that is not appropriate for their gestational age [1,2,8]. The vast majority of extremely premature babies are prone to respiratory disorders of varying severity after birth, which is associated with immature lung tissue and a lack of surfactant [5,9]. In this regard, the use of mechanical ventilation (MV) and various methods of continuous positive airway pressure (CPAP) is a pathogenetically justified way of forming functional

residual capacity (FRC), preventing atelectrauma, and stimulating spontaneous breathing [1,10].

The premise for the search for the most effective methods of lung stabilisation in premature infants is that artificial ventilation, including mask ventilation, can in itself lead to negative consequences in extremely premature patients, especially if it is performed without respiratory volume control [3,6,11].

Research objective: to study the patterns of morbidity and clinical outcomes in extremely premature newborns.

Materials and methods: A retrospective study was conducted of 50 cases of premature births at 22.0–27.0 weeks, delivered at the regional perinatal centre in Bukhara between 2023 and 2025, 50 cases of newborn development, and 40 outpatient records of patients under the supervision of clinicians in the follow-up office.

Results and discussion. Analysis of obstetric history revealed that the average age of mothers was 23.4 ± 0.94 years. In terms of parity, 61% of women were primiparous. In terms of place of residence, the majority of women in labour lived in rural areas (92%). In 82% of cases, the level of education was average. Risk factors for premature birth were: inflammatory diseases of the pelvic organs (42.1%), primary and/or secondary infertility (17.36%), and cervical diseases (32%). The following were established: a complicated obstetric and gynaecological history (induced abortions, spontaneous miscarriages, non-developing and ectopic pregnancies) in 69% of women. A history of premature birth was noted in 35.2% of pregnant women. Habitual miscarriage was diagnosed in 21.1% of women. Threatened miscarriage was diagnosed in 46%. A scar on the uterus after a caesarean section was found in 18.4% of women. In 10.4% of cases, pregnancy occurred as a result of assisted reproductive technologies, in particular in vitro fertilisation. The structure of extragenital diseases is dominated by grade 2 anaemia, which accounted for 76%, acute respiratory viral infections (ARVI) – 51.1%, gestational hypertension – 34%, thyroid pathology – 39%, urinary system pathology – 32%, and metabolic disorders – 20%.
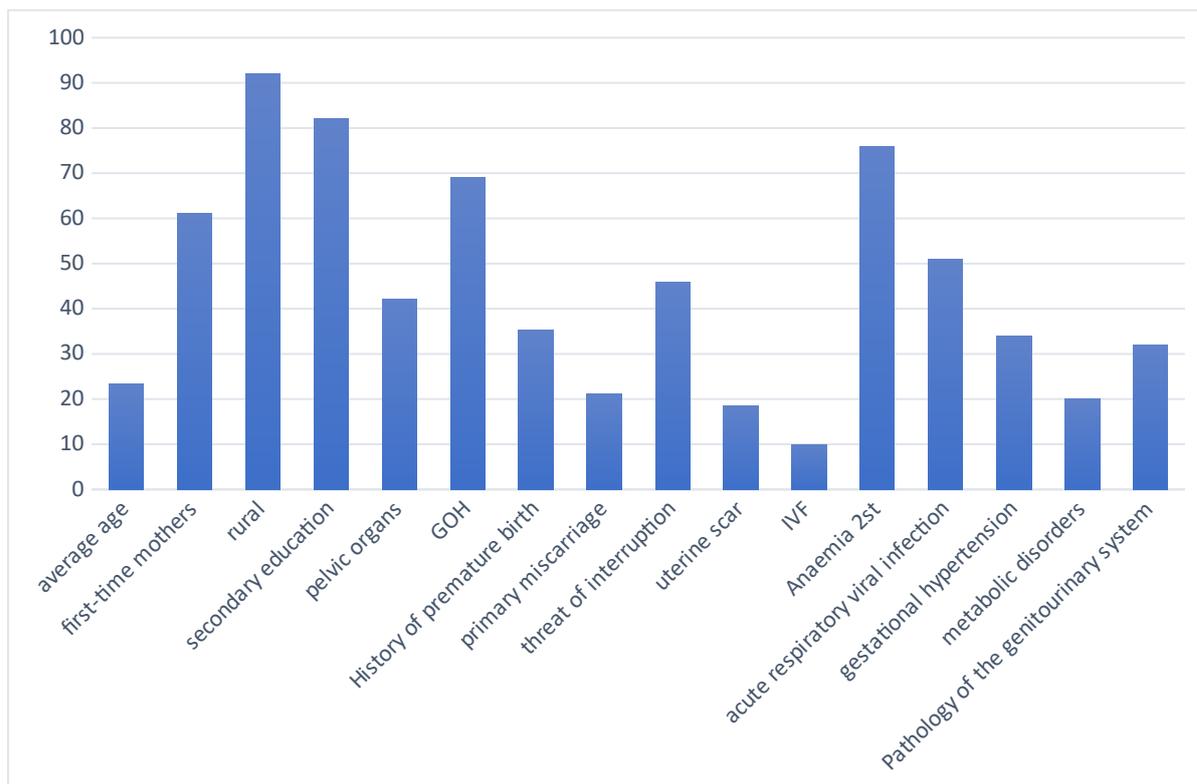
Figure 1. Retrospective obstetric data.

A total of 50 children born between 22.0 and 27.6 weeks of gestation with a birth weight of 525 to 987.0 g (mean MW – 756.0±12.9 g) were examined. In group 1, 3 (6%) children were born at 23.4 weeks via natural birth canal. Two of them died on the second day. In the second group, 47 (94%) children were born at 25–27 weeks, 69% of whom were delivered vaginally. Nine (24.3%) children died, 5 (55.6%) of whom were delivered vaginally. The indications for termination of pregnancy were: severe preeclampsia in 23 (46%) and placental abruption in 4 (8%). Of the 50 women examined, only 38 (76%) received RDS prevention.

In children born at 22–24 weeks (n = 3), respiratory distress syndrome (RDS) was observed in all newborns (100%). In this group, respiratory failure was extremely severe: early mechanical ventilation and high oxygen concentrations were required. Such a high incidence of RDS is explained by the extremely immature structure of the lung tissue and a pronounced surfactant deficiency. Among children born at 25–27 weeks (n = 47), RDS occurred in 42 newborns,

corresponding to a frequency of 89%. In this group, respiratory failure was moderate, with most children requiring non-invasive respiratory support or combined ventilation methods. The decrease in the incidence and severity of RDS is associated with the progressive maturation of the alveolar system and a gradual increase in the synthesis of endogenous surfactant.

In the group of children born at 22–24 weeks (n = 3), the main causes of premature birth were: severe obstetric complications in the mother, including pre-eclampsia and placental abruption, premature rupture of membranes, and intrauterine infection. In the group of children born at 25–27 weeks (n = 47), the leading causes of preterm birth were: threatened miscarriage, including isthmic-cervical insufficiency, intrauterine infection and inflammatory processes in the mother (intrauterine infections, chorioamnionitis), obstetric complications such as polyhydramnios, late gestosis, pregnancy-induced hypertension syndrome, and the use of assisted reproductive technologies (ART) with a high frequency of multiple pregnancies, which increased the risk of early onset of labour.

Thus, the main causes of extremely preterm birth are associated with a combination of maternal, obstetric and foetal factors, among which pre-eclampsia, threatened miscarriage and intrauterine infection predominate.

A follow-up study was conducted on 40 children born with extremely low birth weight (outpatient observation data). All children examined by the age of 1 year showed signs of perinatal CNS damage. Adverse neurological outcomes were observed in 12 children (24%): cerebral palsy in 6 (12%), organic CNS damage in 3 (6%), and hydrocephalus in 3 (6%). A 50% loss of vision due to retinopathy of prematurity was diagnosed in 3 children (6%), and grade II sensorineural hearing loss was diagnosed in 7 children (14%).

Clinical manifestations of bronchopulmonary dysplasia persisted at 1 year of age in 12 children (24%). Among the children examined, 4 (8%) did not suffer from acute respiratory diseases, and 16 children (32%) had ≥3 episodes of acute respiratory diseases.

Anthropometric measurements at 1 year of age showed an average body weight of 6580.1 ± 1005.2 g and an average body length of 70.1 ± 2.0 cm. Analysis of psychomotor development showed that 7 children (14%) were walking independently, which corresponded to the age norm for full-term peers. In 20 children (40%), motor development corresponded to their corrected age, while in 30 children (60%), motor development delay was detected.

Conclusion. The health status of children born at a gestational age of ≤27 weeks at 1 year of age was characterised by a high frequency of complications of perinatal CNS lesions (100%), disability (24%), physical development abnormalities (40%), psychomotor development delay (60%), and a significant level of diagnosis of various pathological conditions.

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