

A NEW PERSPECTIVE ON THE SOCIAL CAUSES AND RESEARCH METHODS IMPACTING PREMATURE BIRTH

(Review Article)

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Abstract

A lot of methods for studying premature babies are given and analyzes based on modern technologies are considered. The data of research literature in Russian in the cyberleninka.ru, e LIBRARY electronic search engines in the Scopus international databases for the period 2018-2022 were processed and analyzed.

Keywords: Premature baby, Neonatal jaundice, Pregnancy, artificial lung ventilation, Birth.

Introduction

The birth of a child ahead of schedule with a high risk of developmental disorders leads to material, social, psychological and pedagogical problems. Risk factors for premature birth can be both socio-demographic and medical. The causes may also include bad habits, poor living conditions, mental and physical injuries during pregnancy. [1] A baby born from 22 to 37 weeks of gestation and weighing from 500 g is considered premature. This provision was introduced by the World Health Organization, joined by pediatricians of our country. There are different degrees of prematurity. The main criterion for their determination is body weight. So, if a child is born with a body weight of less than 1 kg, it is premature with extreme weight; up to 1.5 kg - premature with low body weight, and more than 1.5 kg - just premature. According to WHO data, 15 million premature babies are born every year in the world, i.e. almost one in ten newborns. At the same time, prematurity and its complications are the main cause of mortality in children under 5 years of age. The frequency of premature birth fluctuates in the world from 5 to 18%. Significant differences in the mortality of premature babies are related to low material opportunities in individual countries.

Thus, 50% of children born on a period of gestation of less than 33 weeks die annually in countries with a low level of medical and neonatal care. The complexity of statistical accounting for the morbidity and mortality of premature babies is related to differences in approaches to taking into



account all outcomes of pregnancy. Neurological outcomes also differ between countries and even between regions within the country. This depends on the medical possibilities of observation and correction, as well as the level of morbidity during the newborn period. Currently, high survival rates for deep premature babies have been achieved, which reaches 90% during the gestation period of 26-28 weeks, and for a period of 25 weeks or less does not exceed 60%. Severe neurological complications are recorded in children born for a period of 26 weeks, in 10% of cases, and for a period of 22 weeks - in 50% of cases. Thus, premature birth at a gestation period of 25 weeks or less has a huge risk of mortality and disability. Predictors of adverse neurological outcomes are intraperiventricular hemorrhages, periventricular leukomalacia, chronic lung diseases, postnatal steroid therapy, necrotic enterocolitis, male sex; unknown factors in the nursing process have a certain proportion.!

The purpose of the study:

To analyze and consider cases of premature babies on the basis of modern research methods.

Research methods:

The analysis of medical documentation took into account the sex, body weight of the child at birth, during pregnancy of the mother, Apgar score at birth, duration of artificial lung ventilation (ventilator) concomitant pathology, duration of neonatal jaundice, dynamics of weight gain and frequency of disability in premature infants, psychomotor development of the child, characteristics of anatomical structures of the anterior chamber angle of the eyes of premature infants, allergies in premature infants [3]

Results and discussion:

According to the researchers, premature babies tend to be smaller than full-term babies. Fenton's growth curves provide a more accurate estimate of growth relative to gestational age (Fenton's growth chart for premature boys and Fenton's growth charts for premature girls.

Premature babies are classified by birth weight:

Less than 1000g: extremely low birth weight:

From 1000g to 1499g: very low birth weight

From 1500g to 2500g: low birth weight [4]

Under the supervision of the primary source, there were 56 premature babies in DGP No. 4.

The medical and social characteristics of mothers are presented in Table 1.

Table 1. Medical and social characteristics of mothers.

Age of women	
Up to 20 years old	1
20-29 years old	18
30-40 years old	34
Over 40 years old	3
Level of education	
Higher education	30





Secondary education	19
No data	7
Marital status	
Married	47
No married	9
Bad habits	
Smokes	11

As can be seen from table 1, the majority of women (93%) who had premature babies had a favorable age for pregnancy. More than 50% of women had higher education, 84% were married, 11 women (20%) indicated that they smoke. [5]

According to the Author, the Apgar scale is needed in order to determine which children need more attention. An Apgar score – regardless of what it will be – is not yet a diagnosis. This is a signal to the doctor about what activities are needed now or, conversely, are not needed by the child.

Points	Result
10-7	Optimal, norm
5-6	Slight deviations in health status
3-4	Average deviations in health status
0-2	Severe deviations in health status

[6]

Neuro-controlled ventilation in premature newborns avoids unwanted hypocapnia noted during ventilation in SIMV mode. In addition, the positive aspects of NAVA ventilation include the positive dynamics of a decrease in the concentration of malondialdehyde, which thereby prevents excessive activation of LPO resulting from hypoxia. Synchronization of the hardware inhalation with the child's own breathing attempts in the NAVA mode helps to eliminate both excessive and insufficient

respiratory support for the patient, reduces the patient's stay in the intensive care unit and successfully passes the period of early neonatal rehabilitation. [7]

4250 children were born during the examination period, 120 (2.8%) of them with neonatal jaundice. The main causes of conjugation LV were: bruises that developed during prolonged labor, the use of vacuum extraction of the fetus, etc. -37.5% of cases; intrauterine infection (chorionamnionitis in childbirth, a long anhydrous interval)-27.5%; oxytocin-induced labor - 17.5%; polycythemia -12.5%; other reasons-5%. Among the risk factors were disorders of placental blood flow, infectious diseases during pregnancy, delayed clamping of the umbilical cord. Children with LV were more often born to mothers who had a history of medical abortions, miscarriages, miscarriage. In 16.6% of cases, there was a history of jaundice in previous children. The examination revealed syndromes: jaundice of the skin and mucous membranes up to 3-4 zones on the Kramer scale, anemia, polycythemia. In the biochemical analysis of blood, GB was detected due to an increase in the indirect fraction, a moderate increase in the activity of liver enzymes. The



hourly increase in bilirubin was 5, 2-6, 8 mmol/l. All cases of LV had a mild and moderate course. Non-drug treatment included neonatal care, breastfeeding and continuous round-the-clock phototherapy. The increase in jaundice was observed on the 2-3 day of life, the duration did not exceed 7 days. Positive dynamics of clinical and laboratory parameters was observed on the 5th day. The duration of phototherapy was 5-7 days. [8]

According to the researchers, there were no fundamental differences in terms of weight, body length, frequency of occurrence of z-score values in newborns of different GW at birth. However, in children of all the studied groups, there is a deterioration in mass-growth indicators in dynamics. The most optimal values of length and, especially, body weight are observed in children with GW 33-36 weeks at birth. [9]

According to foreign sources, the birth of premature and sick children is an urgent problem of perinatal medicine. The medical community has achieved results in reducing the mortality of children, but the problems of premature birth and delivery of premature babies, disability of the child population remain important. The main diseases leading to disability can be considered disorders of neuropsychiatric development, mental disability, congenital malformations. These diseases require the earliest possible intervention and the development of a personalized approach to each child included in the risk group for the development of these conditions or in need of correction of the identified disorders. The development of pediatric neuropsychology in the region can be considered a promising direction. The integration of clinical neuropsychologists into medical institutions where a contingent of children with high risk of disorders is concentrated will allow for an early program of restoration of impaired functions, which ultimately can positively affect the demographic indicators of the Kaliningrad region. [10]

One of the main activities of a children's outpatient clinic is dynamic monitoring of a child's development in order to identify individual characteristics of growth and maturation, the pace and harmony of development.

A competent assessment of the child's health status is the diagnostic key to timely resolution of the issue of indications for an in-depth examination and, based on its results, to preventive, as well as therapeutic and habilitation measures. Despite the variety of approaches to solving the problems of assessing the level of development of a young child, the attractiveness of freedom in choosing methods, spontaneity and thoughtlessness in choosing methods for assessing the development of a child are unacceptable. To diagnose developmental abnormalities, it is necessary to use the same type of testing of all children of this age group. This is important to ensure continuity between different medical institutions. [11]

According to the results of recent studies, the opening of the anterior chamber angle occurs due to stretching and rarefaction of the structures of the anterior segment of the eye. In addition, at the moment of opening the anterior chamber of the eye, a homogeneously colored plate appears between the forming cornea and the iris, serving as the boundary of the splitting of the vascular and fibrous membranes, which is destroyed by cells (macrophages).

According to the results of the performed gonioscopy, various variants of goniodysgenesis prevailed in the group of patients born at 24-29 weeks of gestation (Table. 1), mainly of the II degree according to the classification of E.G. Sidorov and M.G. Mirzayants (1991), characterized by the attachment of the iris at the level of the posterior third of the trabecula. In the group of



children born at 30-33 weeks, grade II goniodisgenesis was most often noted (n=25; 41.6%), as well as closure of the drainage pathways of the eye with mesodermal tissue (n=24; 40%), which corresponds to the literature data mentioned above and indicates a deep immaturity of the structures of the eye of a prematurely born child.

Gestational age at birth	Number of eyes	Goniodisgenesis			Mesodermal tissue
		1 sm	2 sm	3 sm	
24-25	4	-	3	1	-
26-27	17	1	7	6	3
28-29	16	6	6	2	2
30-31	28	6	7	-	15
32-33	32	5	18	-	9
34-35	5	1	-	-	4

[12]

The article "prematurity as a risk factor for allergies in children" says: The purpose of our study was to determine the dependence of the occurrence of allergic diseases in children on the degree of prematurity. In the course of the study, we conducted a retrospective analysis of 97 medical histories of children with various allergic diseases on the basis of the gastroenterology department of the Samara City Children's Clinical Hospital No. 1 named after NN Ivanova". The medical and social survey of 15 children was carried out according to the questionnaire developed by us. The main group consisted of premature infants with allergic diseases-15 patients, the comparison group consisted of 100 patients who were full-term, but also had allergic diseases. As a result of the study, we found that in the main group and the comparison group, respectively, boys predominate more by gender (64% and 55%). By age categories, children from 1 to 3 years old (54%) were most often found in the main group, and in the comparison group from 3 to 6 years old (36%).

The course of pregnancy in the group with premature babies proceeded with complications (66%) in comparison with children born at term (65%). Delivery by caesarean section is observed to a greater extent in premature infants, compared with full-term.(74% and 24%). It was also found that there were no differences in genealogical history in both groups. In the main group, the children were artificially fed (60%), while in the comparison group, the children received breast milk (80%). Thus, we have not received reliable data on the effect of prematurity on the occurrence of allergic disease in children, which is probably due to the multifactorial nature of the disease under study. However, a clear relationship was established between prematurity and other pathological conditions in children (perinatal lesions of the central nervous system, diseases of the bronchopulmonary system and anemia [13]

Conclusion:

Thus, despite a fairly large number of studies conducted and coverage in scientific publications of issues related to the health of premature babies, the interaction of medical and preventive institutions and families raising a premature baby in combination with health indicators and life factors has not been studied, the priority of risk factors in the formation of immediate and long-





term health indicators of premature babies has not been established., including during the first year of life. In this regard, there is a need for further development of measures, the implementation of which will preserve and strengthen the health of premature babies, minimize disability and ensure their harmonious development. [3]

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