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Health Condition of Early Age Children Born With Intrauterine Infection

Abstract

The article provides brief information on our study, a prognosis model was developed in order to reduce the risk of complications of intrauterine infections and the formation of chronic pathologies. Early age health condition of the children born in different gestation age with intrauterine infection has been involved into the complex evaluation for the first time. Clinical, functional features and etiological structure of pathological conditions of neonatal period have been learned depending on the risk factors of the children born in different gestation age and intrauterine infection. In the neonatal period it was found statistic high level of changes in cerebral status ($98,2 \pm 1,3$ % and $100,0$ %), haematological and haemorrhagic disorders of newborns ($75,5 \pm 2,5$ % and $85,4 \pm 5,1$ %), respiratory and cardiovascular disorders ($62,7 \pm 4,6$ % və $72,9 \pm 6,4$ %) in term and preterm children ($p < 0,001$). It is important to conduct complex examinations to determine the morphofunctional characteristics of the body of children born with severe intrauterine infection. Given the development of chronic pathologies in children born with intrauterine infection, these children should be registered in the dispensary.

Keywords: *intrauterine infections, children, treatment, early-aged children, lethality, prevalence*

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İntrauterin infeksiya ilə doğulan uşaqların erkən yaş dövründə sağlamlıq vəziyyəti

Xülasə

Məqalədə araşdırmamız haqqında qısa məlumat verilir, intrauterin infeksiyaların ağırlaşmaları və xroniki patologiyaların formalaşması riskini azaltmaq üçün bir proqnoz modeli hazırlanmışdır. İntrauterin infeksiya ilə müxtəlif hamiləlik yaşlarında doğulmuş uşaqların erkən yaş sağlamlıq vəziyyəti ilk dəfə kompleks qiymətləndirməyə cəlb edilmişdir. Müxtəlif hamiləlik yaşlarında doğulan uşaqların risk faktorlarından və intrauterin infeksiyadan asılı olaraq neonatal dövrün patoloji vəziyyətinin kliniki, funksional xüsusiyyətləri və etioloji quruluşu öyrənilmişdir. Neonatal dövrdə serebral statusun statistik yüksək səviyyədə dəyişməsi ($98,2 \pm 1,3$ % və $100,0$ %), yenidoğulmuşlarda hematoloji və hemorragik pozğunluqlar ($75,5 \pm 2,5$ % və $85,4 \pm 5,1$ %) aşkar edilmişdir. Tənəffüs və ürək-damar xəstəlikləri ($62,7 \pm 4,6$ % və $72,9 \pm 6,4$ %) vaxtında və vaxtından əvvəl doğulan uşaqlarda ($p < 0,001$). Ağır intrauterin infeksiya ilə doğulan uşaqların orqanizminin morfofunksional xüsusiyyətlərini müəyyən etmək üçün kompleks müayinələrin aparılması vacibdir. İntrauterin infeksiya ilə doğulan uşaqlarda xroniki patologiyaların inkişafını nəzərə alaraq, bu uşaqlar dispanser qeydiyyatına alınmalıdır.

Açar sözlər: *uşaqlıqdaxili infeksiyalar, uşaqlar, müalicə, erkən yaşlı uşaqlar, ölümcüllük, yayılma*

Introduction

The development of healthcare, which is one of the priorities of the healthcare system of the Republic of Azerbaijan, and the improvement of the quality of medical services provided to the population are always relevant (Aghayev, 2020, p. 164). One of the most complex and important medical and social problems of neonatology and pediatrics is children born with congenital infectious pathology (Solovieva, 2020, p. 164). The exact incidence of intrauterine infections has not been determined, but some authors estimate that it can be as high as 10 % (Shilova, 2020, p. 76).

For this reason, intrauterine infection not only causes perinatal and postnatal losses, but can also lead to serious changes in children's health at a later age, which can lead to a decrease in the child's quality of life and social maladaptation (Ovsiyannikov, 2018, p. 68; Khalafli, 2014, p. 112). Intrauterine infections in most young children lead to the development of diseases that cause disability, such as psychomotor retardation, cerebral palsy, chronic somatic diseases, congenital malformation (Hayashida, 2014, p. 7; Ippolitova, 2020, p. 40). Intrauterine infections in most young children lead to the development of diseases that cause disability, such as psychomotor retardation, cerebral palsy, chronic somatic diseases, congenital malformations (Ito, 2013, p. 566; Kisil, 2023, p. 90).

Research

The study involved 234 children born at 27-42 weeks of gestation. The main group involved 158 children born with intrauterine infection (IUI). Depending on the age of gestation, the main group is divided into 2 subgroups: 110 term children – group 2A, 48 preterm children – group 2B. The control group included 76 practically healthy children with no clinical or laboratory signs of intrauterine infection and was divided into 2 (1A and 1B) subgroups depending on the gestational age.

These children born from mothers having complicated obstetric-gynecological history were transferred at 0-7 day of their life to the SRPI by K. Y. Farajov from different maternity hospitals of Baku city and regions and received inpatient treatment at the reanimator and intensive therapy departments, pathology departments of premature and newborns. Children included into the main group were split into 2 sub-groups depending on their gestation age: 110 children born on time in the group 2A and 48 premature (27-36 week) in the subgroup 2B. Supervision group included 76 children being practically healthy and not having clinical-laboratory symptoms and split into

subgroups 1A (37-42 gestation week) and 1B (27-36 gestation week). Main group included 98 boys and 60 girls, while supervision group included 42 boys and 34 girls.

Special neonatal medical card and catamnestic cards were prepared reflecting anamnesis, clinical diagnosis (dynamics and result of disease), results of inspection and treatment for every children involved into the inspection (Garayeva, 2019, p. 23). CPR (chain polymeraza reaction) and Ig M,G immunoenzymes analysis method was used with the purpose of verification of the causative agents of intrauterine infections together with anamnestic, clinical-laboratory and instrumental inspections (biochemical and serological inspection of blood, inspection of urine and feces) in all children included into the main group

A prospective observation of children's health was conducted, during which morbidity rates were analyzed, as well as physical, psychomotor condition, speech and developmental levels were assessed. Children with IUI have a high incidence of diseases of the nervous system, respiratory system, endocrine system, eating and metabolic disorders during one year old. The prevalence of neurological, respiratory, endocrine, nutritional, and metabolic disorders, congenital malformations, and chromosomal disorders in children with IUI increased significantly from 1 month to 12 months of age compared with the control group. Learning of disease level of early age children born with intrauterine infection that is generalized in our research shows that, prevalence level of respiratory diseases ($56,3 \pm 4,9$ % and $62,8 \pm 7,4$ %), blood and hematopoietic organs diseases ($34,0 \pm 4,7$ % and $30,2 \pm 7,0$ %), infectious diseases ($35,0 \pm 4,7$ % and $23,3 \pm 6,4$ %), nervous system diseases $24,3 \pm 4,2$ %, $27,9 \pm 6,8$ % are statistically shown properly in term and preterm children ($p < 0,001$). Cerebral palsy in children is found in $8,2 \pm 2,6$ % case in group 2A and $10,4 \pm 4,4$ % case in group 2B. The high pathological effect of severe forms of IUI on the central nervous system is confirmed by the diagnosis of cerebral palsy, which was recorded in 8.2 ± 2.6 % in group 2A and 10.4 ± 4.4 % in group 2B. Mortality cases $8,2 \pm 2,2$ % (13) are observed in our research. It was $7,3 \pm 2,5$ % (8) in children born on time and $10,4 \pm 4,4$ % (5) in preterm children. Thus, it is found while deep analysis of the obtained quantity of information that respiratory pathologies, blood and hematopoietic organs pathologies, infectious and parasitary diseases, diseases of nervous system, endocrine system, digestic disorder, disease of skin and subcutaneous tissue, congenital development abnormalities and psychological development disorders are mostly observed in early ages of the children born with intrauterine infections.

In our study, a prognosis model was developed in order to reduce the risk of complications of intrauterine infections and the formation of chronic pathologies. 19 statistical accurate differed factor among the factors that might impact on prognosis were more deeply analysed in the following stage: numbers of births of mother, congenital heart defects in children, echographic-intracranial haemorrhage, ventriculitis, dialation of lateral ventricles, hydrocephaly; laboratory indeces: GFAP, S100B, $\text{SNA-}\alpha$, IL-8, IL-10; infectious and parasitic diseases (A00-B99), congenital abnormalities (Q00-99), diseases of endocrine system and nutrition disorder (E00-99), psychic and behavioural disorders (F00-99), ear and mammary gland diseases (H60-95), and surgical operations. Though statistically accurate differences ($p < 0,050$) were found in the multiple indeces, some indices of statistical accurate differences in the previous researches were not confirmed in the Kruskal-Wallis test: number of birth ($p = 0,634$), haemorrhage ($p = 0,716$), FNT- α ($p = 0,412$), IL-10 ($p = 0,332$), $\text{SNA-}\alpha$ /IL-10 correlation ($p = 0,658$) in blood serum, at the same time, E00-90 diseases ($p = 0,646$) as for the IDC-10 classification within the disease facts up to 1st year. In order not to lose "valuable" information in the planned mathematical model, the inaccurate results obtained in the KruskalWallis test were specified with more specific criteria. Thus crosstables were produced to analyse the quality indices and differences were statistically evaluated with χ^2 -Pearson criteria. It is obvious that, the higher AUC (Area Under the Curve) index is, the higher prognostic strength of model will be. Besides, as statistic accurate result could not be obtained in all KU-Kruskal-Wallis, U-MannWhitney and ROC analysis, other indices (FNT- α , IL-10, FNT α /IL-10) were removed from analysis in the following stage of research. "Cut of point" has been found by using the proven medical methods in the following stage on the basis of the result of ROC analysis. Researches were continued by keeping 13 indexes removing the indexes which statistical accurate correlation

relations defined on the basis of the executed correlation (numbers of births of mother, congenital heart defects in children, echographic-intracranial haemorrhage, dialation of lateral ventricles, hydrocephaly; laboratory indeces: GFAP, S100B, FNT- α , IL-8, infectious and parasitic diseases (A00-B99), congenital abnormalities (Q00-99), diseases of endocrine system and nutrition disorder (E00-99), psychic and behavioural disorders (F00-99), ear and mammary gland diseases (H60-95), and surgical operations. In order to provide a comprehensive assessment of the indicators have studied, we have compiled the following prognostic card using the methods of probability theory based on the data obtained. ANOVA test has been conducted with the purpose of mathematically expressing the prognostic importance of the researched markers in the following stage, impact strength of each marker in the prognosis was calculated by the ratio of (FTG) Fisher-Snedecor and 95 % approximate boundaries were evaluated (Taghiyeva, 2024, p. 4360; Garayeva, 2019, p. 353).

By taking into account that factors possess different impact strength, and using these risk factors in the far period dynamic monitoring is one of the important requirements for evaluating the child's condition, early diagnostics of faced complications and choosing adequate treatment tactics. Also, it must be taken into account that objective evaluation of the child's condition requires to take into account the above mentioned all risk factors, especially, factors having great impact power.

Conclusion

Early age health condition of the children born in different gestation age with intrauterine infection has been involved into the complex evaluation for the first time. Clinical, functional features and etiological structure of pathological conditions of neonatal period have been learned depending on the risk factors of the children born in different gestation age and intrauterine infection. In the neonatal period it was found statistic high level of changes in cerebral status ($98,2 \pm 1,3$ % and $100,0$ %), haematological and haemorrhagic disorders of newborns ($75,5 \pm 2,5$ % and $85,4 \pm 5,1$ %), respiratory and cardiovascular disorders ($62,7 \pm 4,6$ % və $72,9 \pm 6,4$ %) in term and preterm children ($p < 0,001$). It is important to conduct complex examinations to determine the morphofunctional characteristics of the body of children born with severe intrauterine infection. Given the development of chronic pathologies in children born with intrauterine infection, these children should be registered in the dispensary.

A prognostic model of evaluation of the health condition of early age children has been prepared on the basis of statistical data from anamnestic, clinical, and laboratory indicators depending on antenatal, neonatal periods of children born with intrauterine infection.

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