

DETECTION AND PREVALENCE OF RETNOPATHY OF PREMATURE IN SAMARKAND REGION

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Abstract. *The work includes an analysis of statistical collections of the demographic yearbook of the Samarkand region for 5 years (from 2018 to 2023), 160 case histories of infants who were treated in the neonatal pathology department of the Samarkand Multidisciplinary Children's Hospital. All premature infants underwent an ophthalmological examination using a standard method, including: visual examination, examination of optical media in transmitted light, direct and reverse ophthalmoscopy of the fundus under conditions of maximum mydriasis using a Heine head-mounted binocular ophthalmoscope, lenses of 20 and 28 diopters, eyelid lifters and hooks for sclerocompression, if necessary, an ultrasound examination of the eyeball was performed, and from 2022, examination of the fundus was supplemented with examination on a retinal pediatric camera "RetCam-Shuttle" with a viewing angle of 130°. Signs of ROP were assessed in accordance with the International Classification of ROP. Maximum mydriasis was achieved by instillation of the drug Midrimax (a combination of tropicamide solution 0.8% and phenylephrine solution 5%) 30 minutes before fundus examination.*

Keywords: *retinopathy of prematurity, retinal pediatric camera "RetCam-Shuttle", polypeptide drug retinalamin, early anemia of prematurity.*

Introduction

Retinopathy of prematurity (ROP) is a severe vasoproliferative disease of the eyes of premature infants. With a relatively rate of premature births (5-12% of the total number of births), thanks to advances in medicine in recent years, the number of surviving very premature, somatically burdened infants has sharply increased [1, 9, 16, 17]. This, in turn, led to an increase in both the frequency and severity of ROP and the development of disabling forms of the disease.

The frequency and severity of ROP in Uzbekistan and in the world, according to different authors, varies widely, which is associated with a complex of factors: varying degrees of somatic burden of parturient women and newborns, conditions and quality of nursing, adequacy of treatment, structure (according to the degree of prematurity) of surviving premature babies [13].

The severity of ROP, its course and outcomes are determined both by the degree of prematurity (namely, in children with ELBW and early gestational age, ROP not only occurs more often, but is also more severe), and various unfavorable factors affecting the fetus during pregnancy and the child in early pregnancy neonatal period.

Prevention of ROP and its severe forms includes correction of antenatal (maternal condition) and neonatal risk factors [3, 4, 11, 14]. However, the effectiveness of these interventions is controversial and insufficiently studied. In this case, it is necessary to take into account regional characteristics, including environmental factors, morbidity characteristics of women in labor, the possibilities of different organization of ophthalmological care with heterogeneous population density, varying degrees of equipment in newborn care units, etc. [2, 6, 7, 8, 15].

Variations in the incidence of RP and its outcomes in different countries and different regions of our country are associated precisely with these factors. Thus, the frequency of ROP in the risk group varies from 6.9 to 43.9% [5, 10, 12, 18].

Uzbekistan is characterized by a large extent, varying population densities, the presence of a number of climatic and environmental features and existing unfavorable factors. Taking this into account, it seems appropriate to study the regional characteristics of prenatal and postpartum risk factors for ROP in Uzbekistan, assessing the effectiveness of treatment measures in preventing the development of the disease and disability due to ROP.

Materials and Methods

The work includes an analysis of statistical collections of the demographic yearbook of the Samarkand region for 5 years (from 2018 to 2023), 160 case histories of infants who were treated in the neonatal pathology department of the Samarkand Multidisciplinary Children's Hospital. All premature infants underwent an ophthalmological examination using a standard method, including: visual examination, examination of optical media in transmitted light, direct and reverse ophthalmoscopy of the fundus under conditions of maximum mydriasis using a Heine head-mounted binocular ophthalmoscope, lenses of 20 and 28 diopters, eyelid lifters and hooks for sclerocompression, if necessary, an ultrasound examination of the eyeball was performed, and from 2022, examination of the fundus was supplemented with examination on a retinal pediatric camera "RetCam-Shuttle" with a viewing angle of 130°. Signs of ROP were assessed in accordance with the International Classification of ROP. Maximum mydriasis was achieved by instillation of the drug Midrimax (a combination of tropicamide solution 0.8% and phenylephrine solution 5%) 30 minutes before fundus examination.

Early anemia of prematurity was diagnosed by a neonatologist based on clinical signs and laboratory data. In order to neutralize the negative impact of various secondary risk factors for the development of ROP, we used a drug whose active ingredient is a complex of polypeptide fractions - retinalamin. The number of injections and the form of administration were determined individually, depending on the child's maturity, the condition of the retina and the response of the premature baby's eye to the treatment. The drug was administered parabolbar at a dose of 2.5 mg or intramuscularly at a dose of 5 mg from 10 to 30 injections daily or every other day. All studies were carried out without threat of harm to health, with the informed consent of the parents or legal representative of the patient.

Results and Discussion

Somatic burden of women in labor in the Samarkand region and its impact on the frequency and degree of prematurity of newborns.

The Samarkand region has a number of climatic and environmental features and existing unfavorable factors that distinguish it from other regions that can affect the health of the population, including women in labor.

Analyzing the incidence of pregnant women in the Samarkand region, we established a high proportion of a number of diseases affecting the development of the fetus and prematurity.

A sincrease in the incidence of diabetes in pregnant women was revealed in the Samarkand region: from 0.41% in 2020 to 5.4% in 2023 (the average for Uzbekistan is 4.45%). Also, in AK, a high incidence of diseases of the circulatory system in women was revealed (22.27%), which is almost 3 times higher than the general figure in Uzbekistan (7.71%). In women who gave birth to

premature babies, the incidence rate exceeds the average incidence in the Samarkand region by 1.5-2 times.

We also established a high incidence of thyroid diseases in pregnant women in the Samarkand region who gave birth to a premature baby (11.3%). Thus, it has been established that the incidence of diseases of the circulatory system, thyroid gland and diabetes, significant somatic nosologies that affect the course of pregnancy in the Samarkand region is higher than in Uzbekistan as a whole.

Analysis of the influence of prenatal risk factors on the incidence of ROP development

We analyzed the relationship between maternal health indicators and the development of ROP. No significant differences were found between the groups of children with and without ROP according to the age of the mothers. Statistically significant differences ($P < 0.05$) were found in the incidence of hepatitis and diabetes mellitus. And the most pronounced differences, indicating the presence of prenatal risk factors for ROP, were obtained for such parameters as anemia in pregnant women, fetoplacental insufficiency, preeclampsia, and pyelonephritis in pregnant women.

Thus, the connection between the health status of mothers and the development of ROP was analyzed and the most significant prenatal risk factors for the development of ROP were identified, which served as the basis for optimizing the work on the prevention of ROP in the conditions of the Samarkand region.

The role of early anemia of prematurity in the development of ROP and the effect of erythropoietin use on the severity of ROP manifestations.

Considering the high frequency of anemia in women in labor in Samarkand, its role in prematurity and the development of diseases of prematurity, an analysis of the influence of early anemia of prematurity (EAP) on the development of ROP and an assessment of the effectiveness of its treatment was carried out.

We examined 103 premature babies who were treated at different times in the department for nursing premature babies; RAS was detected in 87 babies, which amounted to 80.91%. A correlation was found between the frequency of RAS and the degree of prematurity, with an increase in frequency from 67.95% in children with a gestational age of 32-34 weeks at birth, to 100% in the group of very preterm infants.

In 1910 premature infants, we used various methods of conservative therapy in order to neutralize the negative impact of various risk factors for the development of ROP. In particular, we used a drug whose active ingredient is a complex of polypeptide fractions – retinalamin.

To assess the effect of retinalamin, a comparative study of the nature and severity of ROP in two groups of premature infants was carried out. The groups were comparable in terms of maturity, the nature of concomitant pathology and nursing conditions. The active observation group, which consisted of 91 premature infants, included children with very pronounced retinal immaturity with a gestation period of 24–27 weeks (26.55 ± 0.7).

Birth weight ranged from 495 g. up to 1490 g., the average birth weight was 1026.59 ± 27.41 g.

It was revealed that against the backdrop of a decrease in the birth rate and a decrease in the total number of surviving premature babies, there is an increase in the proportion of surviving very premature children in the high-risk group from 6.73% to 8.23%, which is associated with the introduction of modern perinatal nursing technologies.

However, the analysis showed a relatively low percentage of ROP detection (from 20.2% to 22.7%) in the risk group during this period.

During the period 2007-2011, we introduced examination methods for almost all high-risk children in accordance with clinical recommendations. A comparative analysis of periods 1 and 2 showed that in 2007-2011 the structure of surviving premature babies changed significantly. The relative number of children of low and extremely low gestational age and children with EBMT has increased significantly. The number of immature children treated in the ED increased from 0.55% in 2004-2006 to 4.78% in 2007-2011. With ENMT from 0.74% to 3.99%. Also, against the background of indicators in the number of premature births during this period, there is an increase in the high-risk group as a whole from 8.74% in 2007 to 11.31% in 2011.

During this period, the number of children with diagnosed ROP increased significantly, which was the result of our organizational measures, including training doctors and providing them with modern equipment. The frequency of RP in the risk group during this period averaged 36.51% and ranged from 31.86% to 38.95%, which exceeds the average and indicates the influence of a large number of prenatal risk factors in the Samarkand region on the frequency of RP.

Characteristics of premature babies and the frequency of ROP in the Samarkand region based on the results of examination of children in the ED.

It was revealed that with a significant decrease in the birth rate in the Samarkand region (over 11 years, the number of newborns decreased by almost a quarter), to 23,437 in 2023, the proportion of surviving premature babies is steadily increasing. The proportion of children at high risk for developing ROP is also growing. This is due to the significant somatic burden of pregnant women in the Samarkand region, and with the introduction of modern perinatal nursing technologies leading to an increase in the number of surviving low-weight premature infants.

A system of preventive examinations of children at risk has been established, which has led to an increase in detection, including in the initial stages I-II of ROP. During this period, there is a fairly high detection rate of children with ROP, which varies from 33.63% to 42.01%. in different years, significantly exceeding the average Russian rates of ROP in the risk group.

In the 3rd period, together with neonatologists, nursing conditions were optimized taking into account the identified risk factors.

Outcomes and indicators of disability due to ROP in the Samarkand region at different stages of the organization of ophthalmological care.

During the period 2018-2023, we introduced examination methods for almost all high-risk children in accordance with clinical recommendations.

Although the incidence of ROP increased during the analyzed period, the rates of primary disability in the child population as a result of ROP outcomes decreased by more than 2 times. This indicates the effectiveness of the ongoing treatment and preventive measures, the use of retinal pediatric cameras "RetCam-Shuttle" with a viewing angle of 130° and examinations at prescribed times, with correction of therapy.

Conclusion

1. A significant somatic burden of mothers in the Samarkand region was revealed, significantly exceeding the average for Uzbekistan, and the most significant prenatal risk factors for the development of ROP in the Samarkand region were identified, which should be taken into account in organizing work to correct antenatal risk factors.

2. It has been established that RAS plays a significant role in the pathogenesis of ROP and is an important risk factor for ROP. Moreover, the younger the child's gestational age at the time of birth, the closer the connection between the RAS and the RN.

Early administration of erythropoietin for the treatment of RAS significantly improves disease outcomes and also reduces the overall incidence of ROP in the group of children with early gestation: in infants with gestational age up to 28 weeks who received erythropoietin, adverse outcomes developed in 1.78% of cases, and in children who did not receive erythropoietin in 13.64% ($P < 0.001$). In infants at 29–31 weeks' gestation, the incidence of adverse outcomes is 0 and 1.4%, respectively.

3. The use of peptide bioregulators in very premature infants significantly improves treatment results and the prognosis of ROP; in treated infants, ROP did not develop in 14.29% of cases, severe outcomes developed only in 8.79% of cases, and in untreated infants in 24.44% ($P = 0.027$).

4. The introduction of modern diagnostic and monitoring schemes, taking into account the characteristics of the health status of women in labor in the Samarkand Territory and risk groups for RP, made it possible to significantly improve the detection of RP, including and early stages. It has been established that the high frequency of ROP, reaching 42%, is due to the high somatic burden of women in labor in the Samarkand region.

5. Early detection of ROP, correction of the somatic status of mothers and newborns, and the introduction of laser treatment made it possible to significantly improve the outcomes of ROP and reduce the incidence of visual disability due to ROP in the Samarkand region.

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