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Regional Model of Surgical Care Organization for the Newborn of Sakha Republic (Yakutia)

Abstract

In order to improve the quality of care for neonates with surgical diseases we examined the primary causes of newborn deaths in the period from 1992 to 2011 according to the children's surgical department of Yakutsk data. In 77% of cases the causes of adverse outcomes in neonates with surgical pathology were conditionally preventable. We identified the main organizational direction, which led to a reduction in mortality of infants with surgical pathology in 3, 5 times during the 2 study period. Basic medical and organizational moments of regional model improving medical care for newborns with surgical pathology are antenatal diagnosis of malformations and prenatal consultation by pediatric surgery, competent and timely transportation of the newborns from regions, centralization assist in the level 3 hospital, introduction of modern diagnostic and treatment algorithms, methods of minimally invasive surgery.

Keywords: the newborns, surgical care, congenital malformations.

Introduction

One of the main priorities in the system of health service modernization in the Russian Federation is a surgical care to the newborns. Surgical Neonatology, especially over the last decade, has reached great heights, but the results of surgical treatment of newborns have different values, depending on the region [1, 2].Our regional peculiarities are connected with a vast territory and low population density which influence a medical care of the newborns. Most Central Republican Hospitals are of the 1st level. They haven't possibility to take care of the newborns after operation to give a qualitative antenatal diagnosis of congenital malformations. To perfect the quality of medical care for newborns with a surgical pathology in the conditions of our region it's necessary to set up a system that includes organizing and medical aspects of perinatal and pediatric services, central republican health service helping the newborns.

The surgical department of the Pediatric Center of Republican Hospital №1 of the National Center of Medicine from 1992 till 2011 received 452 the newborns.82% of surgical pathology of the newborns have congenital malformations, 7%- neoplasm, 6,8%-peritonitis (necrotizing enterocolitis, spontaneous stomach perforation), 42%-different pathologies (ovary cyst, incarcerated hernia, etc.). Frequency of congenital malformations has tendency to going up. In the course of researching it has gone up more than 2 times- from 14 in 1995 till 29 in 2011 per 1000 children. The frequency of congenital malformations went up 2.5 times in the industrial regions, the same is observed in the Arctic region and on the other side of the Lena river. (Table 1). Congenital malformations in the structure of infantile death are in the second place, but since 1995 it has gone up to 24%, though perinatal causes have gone down. In the structure of congenital malformations inborn heart disease is in the first place, different anomalies are in the second place, defects of the central nervous system and breathing organs are in the third place. Half of mortal cases take place during the first week of the newborn's life.

Results and discussions

In our Republic screening antenatal diagnosis of congenital malformations has been carried out since 2002. Its effect is 45%, 75% has been revealed till 22 weeks of gestation. Antenatal diagnosis of nosology is given in Table 2. Verification percent is higher in the tumors, gastroschisis, lung defects, congenital diaphragmatic hernia and omphalocele. 45% of pregnancy

has been terminated because of great number of defects and concomitant chromosomal pathology, in other cases it was a family wish in the case of isolated anomalies. But since 2008 a prenatal consultation together with a children's surgeon has been put into practice on the base of medical-genetic consultation. As a result prenatal pregnancy prolongation is going up; antenatal transfer is 45% during the last 5 years. According to the annual record of the Central Republic Hospital percent of screening pregnancy is 80-92%.

During the first researching period (1992-2001) results of the newborn treatment with a surgical pathology were unsatisfactory. Setting up an intensive care department of the newborns on the base of Prenatal Center in 1998 became the positive moment to improve the results of surgical treatment of the newborns during the second period (2002-2011). Since 2000 organizing, tactical and medical algorithms have been changed in the main groups of the surgical pathology of the newborns. In the course of researching period a mortal case has come down 3.5 times. Data in diagram 1 reflect that the mortality in the case of esophageal atresia came down from 93% to 19%, congenital diaphragmatic hernia from 43% to 10%, gastroschisis from 66% to 44%, omphalocele from 50% to 10%, high intestinal obstruction from 53% to 35%, low intestinal obstruction from 60% to 17%, anorectal defect from 29% to 4.8%, necrotizing enterocolitis from 66% to 28%, spontaneous stomach perforation from 80% to 25%.

Analysis of the causes of the newborn mortality with the surgical pathology determined that 77% might be avoided or be controlled. Mortality of only 8,6% of the first period can be referred to uncontrollable cases. In other cases the mortality causes are late diagnosis, non adequate preoperative preparations, wrong medical tactics, iatrogenic causes and septic complications. The iatrogenic causes are errors of operative equipment (4 in the 1st period), wounding of organs and tumors in childbirth (4 out of 5 in the 1st period), complications of infusing therapy (3 out of 6 in the 1st period), 1,2% is referred to transportation errors. Thus, the causes that should be eliminated were singled out.

In 2005 the reanimation consulting center of the newborns was set up in the Republic. Taking into account that regional hospitals are not able to have highly qualified specialists and modern equipments because of the low population density the new organized center plays a great role. Nowadays there are tele-medical communication posts in all central republic hospitals. The number and results of distant monitoring are given in Table 3. The main pathology of mortality as it's given in monitoring is a syndrome of respiratory disorders in the background of immaturity (56%), asphyxia, intrauterine infection, congenital heart malformations (30%), congenital malformations (6%).

Thus, the tactics of centralized surgical aid for the newborns has been justified in the conditions of our Republic. A timely antenatal diagnosis of congenital malformations plays a great role, but still there is a percent of the newborns needing a special evacuation, in most cases these newborns are with heavy prenatal congenital malformations. The main means of transport is an ambulance plane because of the vast territory. Algorithm of transport safety has been worked out. The mortality of the group with congenital malformations in the 2nd period came down 5 times; it's 8% (Table 4). During the transportation mortality was not observed. The following conclusions can be drawn:

-it's impossible to have a favorable result without timely evacuation of the newborn with a surgical pathology;

-competently carried out transportation doesn't worsen a postoperative period of the newborn.

In the hospital conditions of the 3d level new medical algorithms of highly-technological methods of surgical treatment should be introduced. In the course of 5 years small invasive endosurgical intervention in the case of congenital diaphragmatic hernia, congenital pyloric stenosis, lung defects, high anorectal atresia, coloesophagoplasty, endorectal bringing down of colon in Hirschsprung's disease, methods of levatorosphincteroplasty and others are introduced. Besides introduction of new technologies, perfection of surgical methods, acceptance of new

diagnostic and medical algorithms to aid the newborns with a surgical pathology it's necessary to set up the whole system including the relationship between Perinatal and Pediatric services.

Thus, in our region a modern model of surgical aid to the newborns with anomalies supposes qualitative antenatal diagnosis of defects, consultation of children's surgeon before childbirth who'll determine tactics of pregnancy conducting for every child specifically. But there are some complicated defects to be diagnosed antenatally i.e. 42% of the newborns have to be transported to the hospital of the 3d level [3]. Specialized surgical aid is carried out in big Pediatric hospitals having enough reserves of diagnosing and operating possibilities. Pre - operative preparations and early post-operative period should be carried out in specialized neonatal intensive care department.

CONCLUSIONS:

1. 40.4% of defects are in the competence of a children's surgeon and can be corrected at the infantile age.
2. Elimination of controllable causes of the newborn mortality with surgical pathologies, introduction of new algorithms and standard of treatment brought down the mortality 3.5 times.
3. The leading point of the regional model in the aid to the newborns is centralized medical aid as a result of the distant monitoring and competently carried out transportation of the newborns.
4. Specialized surgical aid is possible only in the hospital of the 3d level that unites Perinatal and Pediatric centers providing with successive treatment of the newborns.

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Table 1. Frequency of malformations on the 1000 child population by groups of districts

groups	1995	2000	2003	2006	2007	2008	2009	2010	2011
Arctic	12,5	9,6	16,5	19,9	18,7	21,4	20,2	19,2	25,3
Viluisky	14,6	18,6	19,6	21,3	22,3	18,6	21,5	17,9	19,0
o. s. Lena r.	13,4	11,1	17,1	22,7	23,8	20,9	24,2	28,5	26,7
industrial	10,7	12,5	19,4	24,9	25,8	23,9	23,9	26,7	26,9
central	11,3	11,7	12,4	14,6	16,6	18,4	21,2	20,4	21,2
Yakutia	**14,0**	**14,9**	**22,0**	**24,8**	**26,6**	**24,6**	**26,5**	**28,3**	**29,0**

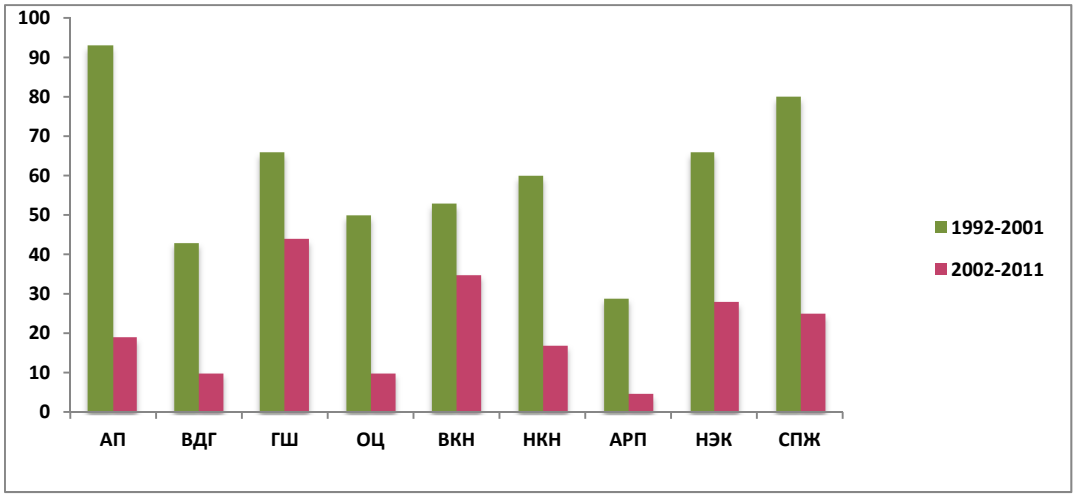

Fig 1. Reduction of mortality by major disease groups and malformations in infants during the study period.

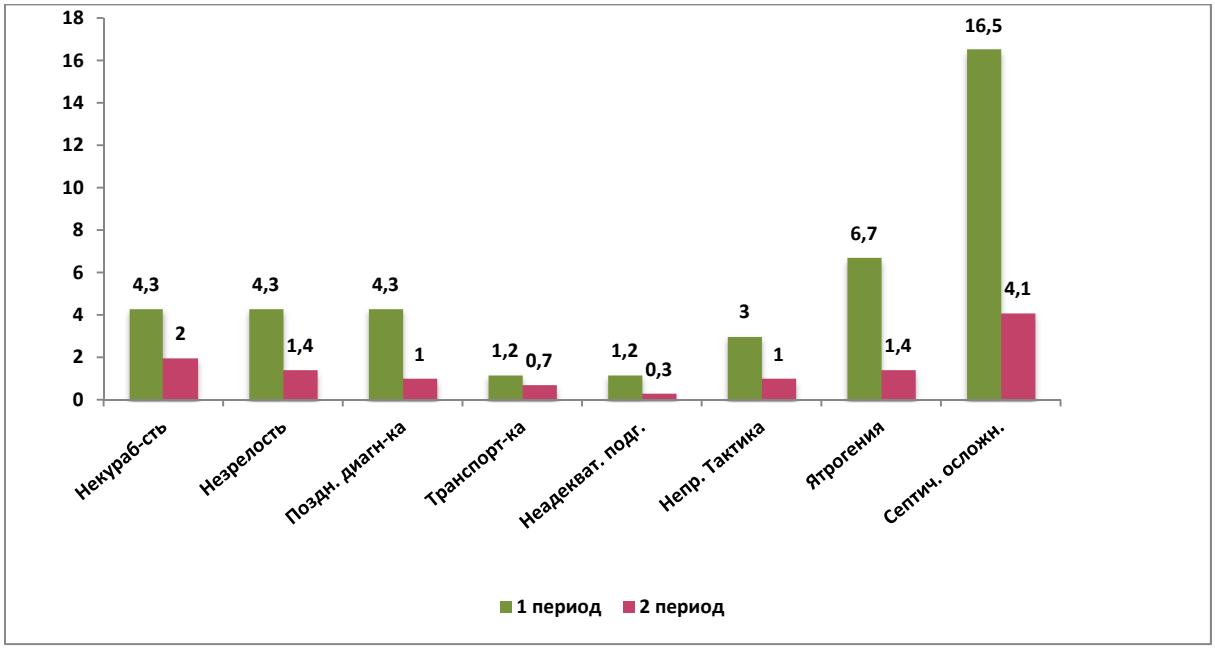

Fig. 2. Comparative structure causes deaths by period.

Table 2. Antenatal diagnostics from II period (2002 by 2011)

malformations	Total	Antenatal diagnostics	Interrupted from identified	Born
gastroschisis	39	35 (90%)	21 (60%)	18
Congenital diafragmatic hernia	28	19 (68%)	8 (42%)	20
omfalocele	18	11 (61%)	8 (73%)	10
Esophageal atresia	32	6 (19%)	5 (83%)	27
Intestinal obstruction	51	14 (27%)	5 (36%)	46
Anorectal atresia	48	6 (12%)	5 (83%)	43
Lungs malformations	10	8 (80%)	6 (75%)	4
Tumors	4	4 (100%)	2 (50%)	2
Total:	230	103 (45%)	60 (26%)	170

Table 3. Transportations newborns with congenital malformations and mortality in groups

I period		II period	
Without transportation	transportation	Without transportations	transportations
55	47 (46%)	97	71 (42%)
32 mortality	20 mortality	23 mortality	6 mortality
58%	42%	23,7%	8%

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MACRONUTRIENT COMPOSITION OF BREAST MILK AND FEEDING HABITS OF LACTATING WOMEN OF DIFFERENT ETHNIC GROUPS IN THE RUSSIAN NORTH

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Abstract

The study is based on results of energy value and macronutrient composition of breast milk research and its relationship to diet of lactating women of different ethnic groups living in the Republic Sakha (Yakutia). We revealed that the energy value and the macronutrient composition of breast milk to a large extent were determined by ethnicity and region of residence of women.