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PNEUMOCOCCAL VACCINE VACCINATION IN CHILDREN WITH CONGENITAL HEART DEFECTS

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A B S T R A C T

193 vaccinated children were observed for 1.5 years. At the age of 2–6 months, 30% of premature and 46% of children with congenital heart defects were vaccinated with the PCV7/PCV13 vaccine; at the age of 7–11 months, 52 and 40%, respectively. In 65% of cases, the PCV7/PCV13 vaccine was administered together with other vaccines in the national preventive vaccination schedule. The frequency of general post-vaccination reactions (increase in body temperature from 37.6 to 38.0°C) was 4%; no local reactions were recorded. No other adverse events were noted in the post-vaccination period.

K E Y W O R D S

Children, premature babies, pneumococcal vaccine, congenital heart disease.

Introduction

Pneumococcal infections in children in the first years of life are a serious global public health problem. It is well known that Streptococcus pneumoniae (pneumococcus) can cause both severe invasive infections - meningitis, invasive pneumonia (in some cases with empyema), sepsis, including occult bacteremia (that is, fever without a visible focus of infection), and less severe , but much more common diseases are otitis media, sinusitis, pneumonia and bronchitis. This problem is most pressing in the group of children under 5 years of age, the incidence among whom is estimated at 0.29 episodes per child per year in developing countries and 0.05 episodes per child per year in developed countries. However, from 7 to 13% of cases of pneumococcal infection are severe and require hospitalization. The highest incidence of invasive pneumococcal infections is noted in risk groups, which include children on early artificial feeding, with malnutrition, low birth weight (including premature infants), and living in overcrowded conditions [1]. In addition to the above, the World Health Organization also lists environmental pollution as risk factors that increase the frequency and severity of pneumococcal infections.

MATERIALS AND METHODS

The effectiveness and safety of vaccination were assessed using an analysis of outpatient records of vaccinated children during the observation period (18 months). In the post-vaccination period, children

were actively visited the day after vaccination; subsequently, the children's condition was monitored by interviewing parents by telephone.

Initially, children aged 2–6 months were vaccinated according to the instructions for the Prevenar vaccine according to the 3+1 scheme; at 7–11 months - 2+1; at 12–23 months - 1+1. Children over 24 months of age were given the vaccine once. However, in 2012, due to a shortage of vaccines, children were vaccinated from 2 months of age according to the 2+1 schedule [2].

RESULTS AND DISCUSSION

It should be noted that according to statistical data, in maternity hospitals in Irkutsk the proportion of children with prematurity annually is about 7%, of which 85% of children have concomitant respiratory pathology (distress syndrome and/or pneumonia). 5% of premature infants have indications for artificial ventilation. Approximately 50–70 children are born with congenital heart disease each year.

Table 1. Background pathology in children aged 2–23 months vaccinated with pneumococcal conjugate vaccine

Background pathology, abs.	Age at which vaccination began			
	2–6 months	7–11 months	12–23 months	Total, abs. (%)
Total number	66	63	35	164
Prematurity	31	33	11	75 (45,7)
UPS	20	17	6	43 (26,2)
History of resuscitation measures (including artificial ventilation)	9	11	11	31 (18,9)
Perinatal exposure to HIV and HIV infection	6	9	10	25 (15,2)

Since this group of children is very large, the volume of budget funds allocated for the implementation of priority preventive measures, that is, vaccination against pneumococcal infection, amounted to 30% of the total funding for vaccine purchases.

Obviously, these funds did not allow for vaccination of pneumococcal infection in children at risk in the required volume, so a decision was made on a co-financing program, that is, it was planned to carry out the second and third administration of the conjugate vaccine at the expense of insurance companies or personal funds. In this way, complete and effective immunoprophylaxis of pneumococcal infection was ensured among children at risk, while the estimated vaccination coverage in the first stages of the program should have been no more than 75% of children in the above groups.

Diseases due to the presence of which children were classified as at risk are presented in Table. 1

It is important to start vaccinating children with congenital heart disease as early as possible, since surgery and a long hospital stay in the postoperative period increases the risk of developing pneumococcal infection several times. The children with congenital heart disease we observed were vaccinated with PCV7/PCV13 in 46% of cases in the first half of life, and in 40% of cases in the second half of the year.

Specific prevention of pneumococcal infection in children of the first year of life with the PCV7/PCV13 vaccine makes it possible to prevent severe diseases of the bronchopulmonary and central nervous system.

Vaccination with both 7- and 13-valent conjugate pneumococcal vaccines in children at risk is safe, including when combined with other vaccines of the national calendar.

CONCLUSION

To achieve an epidemiologically significant reduction in the incidence of diseases caused by S. pneumoniae, mass vaccination of children in the first year of life (preferably from 2 months of age) is necessary.

Mass vaccination is the most accessible, economical and effective way to combat pneumococcal infection; there is an absolute need to introduce vaccination against S. pneumoniae into the national vaccination calendar in 52 countries around the world.

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