



Some aspects of evaluation of vaccine prophylaxis organization in obstetric hospitals and children's polyclinics

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Abstract

Properly organized vaccination in medical organizations is a guarantor of infectious diseases control and serves as a protective barrier to the spread of childhood infections. In order to assess the organization of children's vaccination in obstetric hospitals and children's polyclinics by random sampling on the basis of 7 children's polyclinics in St. Petersburg a survey of 1724 mothers who had 1 year old children born in 2016-2017 was conducted. Evaluation of children's vaccination coverage in the first year of life showed that 84.3% are vaccinated according to the National calendar of preventive vaccinations. In general, 15.7% of children had vaccination disorders, 4.9% of them were not vaccinated completely, and 10.8% - partially. The main reason why children are not vaccinated both in maternity institutions and in children's polyclinics are medical contraindications associated with the health of the child in more than 75% cases. Subjective reasons for violations of vaccination status in most children are the belief of parents in the absence of risk of infection with some children's infectious diseases and fear of possible post-vaccination complications. The highest proportion of children was vaccinated against rubella (91.5%), the lowest - against pneumococcal infection (68.5%). Less than a third of mothers (30.5 %) indicated that they had received detailed information from their doctor about the vaccine, the disease for which the child would be vaccinated and the possible consequences of immunization. At most of the respondents, monitoring of the child's condition after immunoprophylaxis was not carried out in accordance with the instructions. The main source of information for 91.1% of parents is the Internet. Only 31.4% of respondents identified health workers as the main sources of information on vaccine prophylaxis. Thus, despite the relatively high vaccination coverage of children of the first year of life, there are a number of significant shortcomings in the vaccination organization. There is a need to optimize the organization of vaccination in medical organizations of St. Petersburg.

Keywords: vaccination, children, national calendar of preventive vaccinations, obstetric hospital, children's polyclinic

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INTRODUCTION

More than 130 million children are born every year, and every child equally needs protection from vaccine-preventable diseases. According to WHO, no preventive health measure is more effective than immunization. It prevents more than 2.5 million deaths. However, every year 9 million children die from infectious diseases, with 3 million ones dying from infections for which vaccines are available (Heidi et al. 2016, Larson et al. 2016, Maman et al. 2015, WHO 2012). In 2017, a record high number of children were vaccinated – 116.2 million

people, but 19.9 million children remained unvaccinated. Global vaccination coverage is still at 85%, with no significant changes over the past few years (Orenstein and Ahmed 2017, World Health Organization 2018, Strategic Advisory Group of Experts on Immunization 2018). An urgent problem is the high risk of morbidity among 2 year old children, due to the fact that the

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immune system in this period continues to form (Haraeva et al. 2019, Ivanov et al. 2019, Iurev et al. 2019).

Vaccination today is one of the most cost-effective interventions in the field of public health (Kovtun et al. 2010, Petrova 2019, Platonova et al. 2019). The successes achieved as a result of the maximum coverage of children's preventive vaccinations at the decreed age within the framework of national programs determined the patterns of the epidemic process of controlled infections and created conditions for their elimination (Marshall et al. 2002, Ozawa 2013, Weekly epidemiological record 2008). In the long-term dynamics, including the last ten years (2009-2018), in Russia there was a tendency to decrease the incidence of a number of vaccine-controlled infections, however, for some of them, on the contrary, an increase was revealed. The most significant drop was in the incidence of acute viral hepatitis B – by 22.1 % and mumps – by 2.2 times. The increase was observed in the incidence of measles – by 3.5 times, whooping cough – by 1.9 times and community-acquired pneumonia caused by pneumococci – by 38.2 % (Briko and Feldblum 2017, Namazova-Baranova et al. 2019).

In the Russian Federation, in accordance with the Federal Law of 17 September 1998 No. 157FZ “On immunoprophylaxis of infectious diseases”, vaccination is considered an integral part of the state health policy (Federal Law No. 157-FZ of 17.09.1998). The state guarantees free prevention of infections included in the national calendar of preventive vaccinations and the calendar of preventive vaccinations for epidemic indications in medical organizations of the state and municipal health systems (The Order of Ministry of Health of Russia dated 21.03.2014, Kharbedia 2018). Vaccination of children, according to the current legislation, is voluntary. Therefore, parents have the option to unsubscribe from a particular vaccination or all of the vaccine prophylaxis (Krieger et al. 2018). To a large extent, the occurrence of refusals, and as a consequence, the decrease in children's vaccination coverage, contributes to the media, which tell about a large number of complications arising in the post-vaccination period (Gámez et al 2017, Moskvicheva et al. 2017).

Thus, properly organized vaccination in medical organizations is a guarantor of infectious diseases control and serves as a protective barrier to the spread of childhood infections.

Research Objective

Assessment of the organization of vaccine prophylaxis in obstetric hospitals and children's polyclinics of St. Petersburg.

MATERIALS AND METHODS

The study was conducted on the basis of 7 children's polyclinics in St. Petersburg. According to a specially developed form “Questionnaire of the mother of a one year old child”, a random sample was used to survey 1724 mothers who had 1 year old children, born in 2016-2017. Among the respondents, 1.9% was 15-19 year old mothers, 20-24 year old – 4.2%, 25-29 year old - 39.1%, 30-34 year old – 36.5%, 35-39 year old – 12.1%, 40-44 year old – 6.2%. The mean age of the mother was 30.6 ± 0.07 years.

The “Questionnaire of the mother of a one year old child” consisted of two parts and included 22 closed and open questions. The first part of the questionnaire included special questions that were devoted to establishing the availability of vaccinations against hepatitis B and tuberculosis in obstetric hospitals, as well as the reasons for their absence. The second part of the questionnaire was devoted to the organization of vaccination in children's polyclinics (departments). It included questions about the presence or absence of a child vaccinations for the 1st year of life, according to the national calendar of preventive vaccinations; the main sources of information about vaccination, about the possible causes of non-vaccination; about parents' completeness of information receipt from the pediatrician about the disease for which vaccination is carried out, and also data on the place of carrying out vaccination and what vaccines the child was vaccinated, etc. Mathematical processing of data was carried out using spreadsheets “MS Office Excel 2010” and the statistical software package PASW STATISTICS.

RESULTS AND DISCUSSION

In the Russian Federation, according to the national calendar of preventive vaccinations, the first vaccination against viral hepatitis B a newborn receives in a maternity hospital in the first 24 hours of life. On the 3rd -7th day after birth, the child is vaccinated against tuberculosis. In the future, children are vaccinated after discharge from the obstetric hospital in the children's polyclinic.

The procedure for vaccination in medical organizations is strictly defined by legal acts. The consent of the parents (legal representatives) of the child is taken for vaccination, which is filled out in writing. All children on the day of vaccination are examined by doctors taking into account anamnestic data and thermometry. Children with relative medical contraindications, vaccination is carried out according to an individual scheme, according to the recommendations of the relevant experts. Acute infections and non-infectious diseases, exacerbations of chronic diseases are considered temporary contraindications for vaccination. Routine vaccinations are carried out in 2-4 weeks after recovery. Health

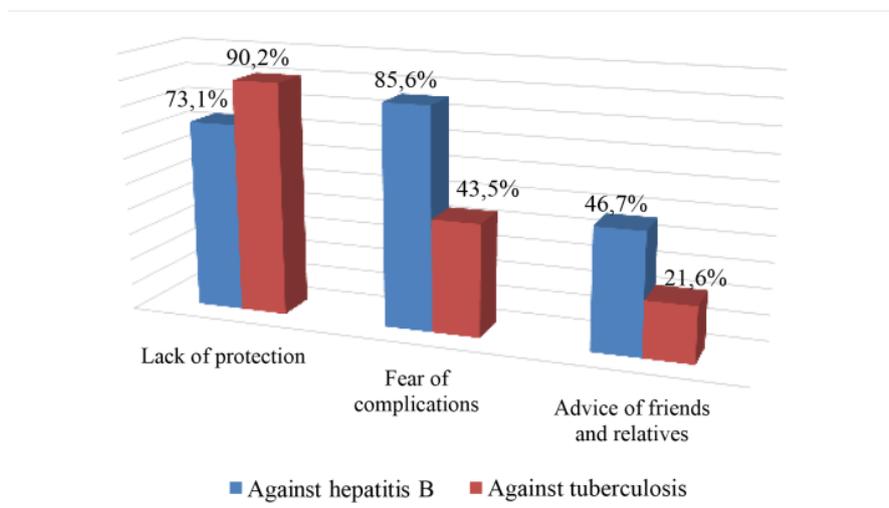


Fig. 1. The share of individual subjective reasons for refusal of parents from vaccination against hepatitis B and tuberculosis in obstetric hospitals (in %)

workers visit the child the day after vaccination to determine the nature of the reaction to vaccination. Data on the reaction to vaccination are recorded in medical records. Currently, the health practice has a "Vaccination certificate", which contains all the information about vaccinations for a particular child (Moskvicheva et al. 2017).

It is established that the immunization coverage against hepatitis B in obstetric hospitals was 79.3%. The main reason why children were not immunized against hepatitis B in 75.6% of cases was medical contraindications related to the health of the child. In 24.4% of cases, children were not vaccinated because of parents' prejudice against vaccinations. The fear of possible complications in the post-vaccination period (85.6%), the belief in the lack of protection against infections with the help of immunoprophylaxis (73.1%) and the advice of friends and relatives not to vaccinate the child (46.7%) were among the main reasons for the mother's refusals. The proportion of individual reasons for refusal of parents from vaccination in obstetric hospitals is shown in **Fig. 1**.

88.8% of children were vaccinated against tuberculosis in obstetric hospitals. The assessment of the causes of non-vaccination of children showed a similar picture with vaccination against hepatitis B: in 77.8% of cases children were not vaccinated because of medical contraindications, in 22.2% of cases - because of parents' prejudice against vaccination. The subjective reasons for mothers refusing vaccination were also similar. Among the main reasons for refusal, 90.2% of mothers cited the belief in insufficient protection against infections with immunoprophylaxis. However, the fear of possible complications in the postvaccinal period and the advice of friends and relatives not to vaccinate the child had a significantly lower proportion than when refusing vaccination against hepatitis B (43.5% and 21.6%, respectively).

Table 1. The proportion of children vaccinated against certain diseases in the 1st year of life (in %)

| Disease | Proportion |
|------------------------|------------|
| Hepatitis B | 89.1 |
| Tuberculosis | 88.8 |
| Pneumococcal infection | 68.5 |
| Diphtheria | 70.8 |
| Whooping cough | 79.1 |
| Tetanus | 79.7 |
| Poliomyelitis | 85.8 |
| Hemophilic infection | 72.8 |
| Measles | 86.2 |
| Rubella | 91.5 |
| Mumps | 88.3 |

Voluntary parental consent for vaccination against hepatitis B and tuberculosis, which is a prerequisite for medical intervention, was obtained in 99.7% of cases, according to mothers. And in 0.3% of cases, respondents found it difficult to answer this question.

After released from maternity institutions, preventive vaccinations for children are carried out in vaccination offices of medical organizations that provide medical care on an outpatient basis. Evaluation of children's vaccination coverage in the first year of life showed that according to the national calendar 84.3% were vaccinated. Accordingly, in the study group as a whole, 15.7% of children had vaccination disorders, 4.9% of them were not vaccinated completely, and 10.8% - partially. While 24.9% of mothers indicated that their children were vaccinated with domestic vaccines, 24.3% - with import of vaccines, 18.2% - with both domestic and imported vaccines, and 32.6% did not know about the origins of vaccines, with which their child was vaccinated (Bazzi et al 2014).

The study of the coverage of children with vaccination against certain diseases allowed establishing that the highest proportion of children was vaccinated against rubella (91.5%), the lowest - against pneumococcal infection (68.5%). The proportion of vaccinated children against certain diseases is presented in **Table 1**.

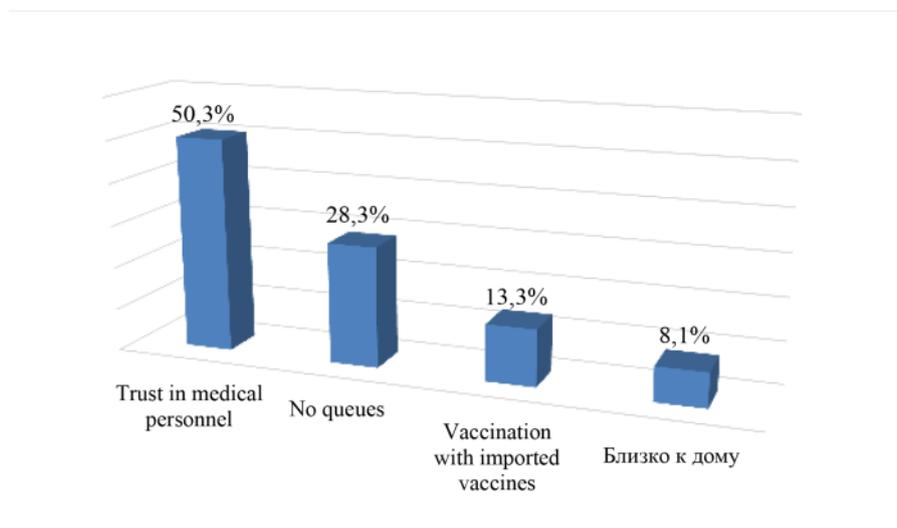


Fig. 2. Distribution of parents depending on the main reason for choosing a medical organization to vaccinate their child (in %)

The study found that 84.7% of children were vaccinated in children's polyclinic, 13.9% in private medical centers, and 1.4% in the Institute of childhood infections. The main reason for choosing a medical organization to vaccinate their child, mothers called the trust of medical personnel (50.3%). Among other reasons the following ones were noted: lack of queues (28.3%), vaccination with only imported vaccines (13.3%), the medical organization close to the place of residence (8.1%). The main reasons for choosing a medical organization for immunization of children are shown in **Fig. 2**.

Before vaccination, in addition to obtaining informed consent, the pediatrician is obliged to inform parents in detail about the vaccine and the disease for which the vaccination will be carried out, the reaction of the child's body to the vaccination and possible post-vaccination complications. Voluntary consent before immunization of the child was signed by 97.1% of parents, 2.9% of respondents found it difficult to answer this question. Less than a third of mothers (30.5 per cent) indicated that they had received detailed information from their doctor about the vaccine, the disease for which the child would be vaccinated and the possible consequences of immunization. More than half of parents (51.9%) claimed that before vaccination the pediatrician only told the name of the vaccine and against what disease the vaccine prevention will be carried out. And 17.6% of mothers said that the doctor did not provide any information about vaccination.

The study of the causes of incomplete coverage of children with vaccine prophylaxis of infectious diseases in the first year of life, according to the vaccination calendar, showed that the main cause in 89.8% of cases with partial vaccination and in 82.5% of cases with complete rejection of it were medical contraindications. The subjective reasons why parents completely

abandoned vaccination were doubts about the quality of vaccines (74.4%), fear of possible post-vaccination complications (66.7%) and belief in the absence of risk of infectious diseases infection (64.1%). The reasons for the choice of vaccination against certain diseases (partial vaccination) were the belief in the absence of risk of infection with some childhood infectious diseases (81.3%), fear of possible post-vaccination complications from individual vaccines (69.7%), as well as the opinion of parents that it is better to transfer the child this infection in childhood (43.2%). The main subjective reasons for parents' refusal of vaccination in the first year of life are shown in **Fig. 3**.

At properly organized vaccination health workers should monitor the condition of the child in a medical organization for 30 minutes after it, and in a day visit the child at home. The majority of respondents (49.1%) answered that the day after the immunoprophylaxis a medical worker clarified the information about the child's well-being by phone. Only 11.8% of mothers indicated that health workers monitored the child for 30 minutes after vaccination, and 11.6% of respondents noted that the pediatrician (nurse) visited the child at home a few days after vaccination. At the same time, 1.7% of parents reported that there was no monitoring after vaccination. And 0.5% of respondents brought the child to a medical organization themselves.

Due to the fact that a significant proportion of children had violations of the vaccination status, it is of great interest to determine the main sources of obtaining information about vaccination from parents. The survey showed that the Internet was the undisputed leader among the sources of information for mothers participating in the study (91.1%). In addition, parents received information about vaccination from the media (43.6 per cent), relatives, acquaintances (36.2 per cent) and periodicals (11.8 per cent). Only 31.4% of

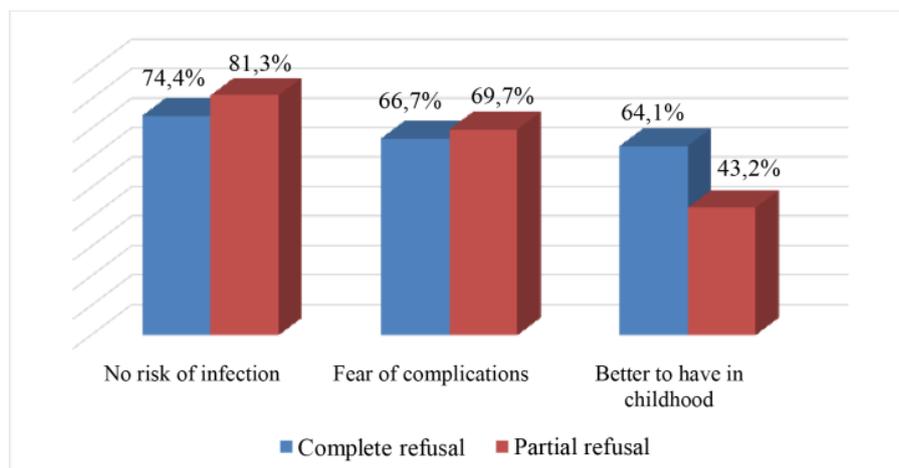


Fig. 3. The proportion of individual subjective reasons for partial and complete refusals of parents from vaccination in the child's first year of life according to the national calendar of preventive vaccinations, (in %)

respondents identified health workers as the main sources of information on vaccine prophylaxis.

CONCLUSIONS

Despite the relatively high vaccination coverage of children in the first year of life, there are a number of significant shortcomings in the organization of vaccination, among which the most significant are violations of monitoring the health of the child after vaccination.

The lack of information about vaccination received from health professionals, encourage parents to search

independently for information and obtain information from unverified sources (the Internet).

The conviction of parents in the insufficiency of protection against infections with the help of immunoprophylaxis and the fear of possible complications in the post-vaccination period lead to the emergence of preventable refusals from vaccination both in general and for individual diseases.

Low alertness of the population in relation to vaccine-controlled infections leads to the belief in the correctness of refusals from vaccinations, which in turn leads to the incidence of outbreaks of childhood infections.

Thus, there is a need to optimize the organization of vaccination in medical institutions of St. Petersburg.

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