

ORIGINAL PAPER

# Vaccination refusal as a growing issue – a description of the phenomenon occurring among parents of infants born at the Professor Wojciech Starzewski Memorial Centre for Women and Children’s Health in Zabrze during first three years of its functioning

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## ABSTRACT

**Introduction:** Vaccinations are a safe and effective way to protect against infectious diseases. They are particularly important in the neonatal and infancy period, when the immune system is not yet fully developed. The growing strength of the controversial trend for not vaccinating children cannot be ignored. In Poland an increasing number of parents are deciding not to vaccinate.

**Aim of the study:** The aim of the study is to determine the proportion of unvaccinated infants born in CZKiD in its first three years of functioning (01.11.2014 – 31.10.2017), define the parents’ education level and answer the question of whether it influences their decision not to vaccinate, and ascertain whether there is a growing tendency not to vaccinate newborns.

**Material and methods:** Retrospective analysis of newborns whose parents did not agree to vaccinations recommended during first 24 hours of life, despite lacking medical contraindications to do so. The work is prepared on the basis of medical documentation and analysis of hospitals’ quarterly lists of parents avoiding children’s vaccinations.

**Results:** Among 5246 (2014/2015 – 1384, 2015/2016 – 1772, 2016/2017 – 2090) babies born in the analysed period, 130 (2.48%) have not been vaccinated (2014/2015 – 1.73%, 2015/2016 – 1.98%, 2016/2017 – 3.4%). 109 newborns come from on-time deliveries (38–41 week). The vast majority of newborns were eutrophic (114). The general condition of all newborns was assessed as good (Apgar). Approximately 98% of parents represented at least secondary education level. Moreover, most of them did not disclose clear-cut cause of refusal.

**Conclusions:** Our three years’ experience shows that a growing number of parents do not accept birth vaccination doses. What is more, their decision is made even before birth, and from the beginning of hospitalisation they are determined not to allow vaccinations. Most often, this decision is not justified, even though there is a formal possibility to do so. The majority of parents refusing vaccinations are those with at least secondary education. At the moment there is no such data in Polish papers.

## KEY WORDS:

vaccination refusal, newborns, BCG, tuberculosis, HBV, immunisation.

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## INTRODUCTION

Vaccination is an effective and safe way to protect against many infectious diseases. They contribute to a radical decline in morbidity, and they reduce the number of complications as well as mortality caused by dangerous pathogens [1]. What is extremely important, vaccination form the population's resilience and also protect the part of population that could not be vaccinated for various reasons [2].

The current epidemiological status of infectious diseases in Poland has been achieved primarily through the vaccination programs implemented for many years, which is why it is extremely important to continue such vaccinations. The consequence of their cessation is the decrease in the immunity of individuals and populations, and the emergence of epidemics [3].

In association with the development of the so-called "anti-vaccination movements", the growing controversial trend of not vaccinating children cannot be ignored. Refusals already apply to vaccinations performed in the first days after birth, and it should be emphasised that in the neonatal period and in infancy, active immunisation is particularly important because the immune system is not yet fully developed and requires special protection [4]. The following study is original, because at the moment there is no other research in Polish literature showing the scale of rejection of first vaccinations (i.e. against hepatitis B and tuberculosis).

In Poland the percentage of children subjected to active immunisation, in comparison to other countries, is still high [5], but, unfortunately, obligatory vaccinations are denied by a growing number of parents. In 2014 the refusal of parents resulted in non-inoculation of 12,681 children, in 2015 – 16,689, in 2016 – 23,147, and in 2017, by preliminary estimates, almost 30,000 [6, 7]. Among the Polish voivodships, Masovia and Silesia are the most discreditable in terms of the number evading vaccinations [7]. The reason for this phenomenon is most often parents' or their children's fear of the adverse reactions caused by their previous vaccinations and the impact of the so-called anti-vaccine movements. Less important causes are the influence of social groups that promote so-called alternative medicine and the cultural, ethnic, and religious differences identified by the parents [7], which is also reflected in the results presented in the following work.

## AIM OF THE STUDY

The goals of the study are: an attempt to isolate the percentage of unvaccinated unborn children in the first days of life against hepatitis B and tuberculosis, while in CZKiD (Centrum Zdrowia Kobiety i Dziecka) in Zabrze, due to parents' beliefs, in the three years from 01.11.2014 until 31.10.2017, defining the structure of education of

the children's guardians, along with an attempt to answer the question of whether it affects the decision about not being vaccinated, and whether the tendency not to perform mandatory vaccinations is growing.

## MATERIAL AND METHODS

The retrospective study included 5246 children born in CZKiD, whose caregivers did not agree to perform BCG and/or hepatitis B vaccination during the first three days of the child's life. The work was prepared on the basis of medical and nursing documentation as well as conversations with the newborns' mothers and fathers. In addition to the basic epidemiological data, a quarterly report for SANEPID (standardised questionnaire) on information from parents concerning the reasons for refusing the first vaccinations was also collected. Information taken into consideration comprised: the method of pregnancy termination, newborns' sex, birth length and body weight, gestational age, Apgar score, and the level of education of mothers and fathers, as well as reasons why they did not decide to vaccinate the child.

The study covered newborns who were born in CZKiD and, in addition to the parents' strong refusal, had no known medical contraindications to their vaccination.

## RESULTS

During the three-year follow-up, out of 5246 neonates born 130 (2.48%) were not vaccinated only because of their parents' refusal to vaccinate. Eighty-nine newborns were born by vaginal delivery and 41 by caesarean section. Sixty-nine of them were males and 61 were females. The average body weight at birth was 3400 g, the average body length was 54.5 cm, the average score on the Apgar scale, respectively, at first and fifth minute of life was 9 and 10 points, and the average gestational age was 39 weeks. Most caregivers (79.23%) refused to vaccinate children against both hepatitis B and tuberculosis. Some of the parents agreed to vaccinate selectively – 8.5% refused only the hepatitis B vaccine, while 11.5% refused only the tuberculosis vaccine. However, it was not possible to explain the reasons for the selective actions of parents, although each time the parents were asked the reason for refusing to vaccinate the newborn. Nearly 99% of caregivers from whom information was obtained indicated the reason "other" in the questionnaire, without giving a specific reason for their behaviour. However, only 7.7% of parents admitted that the reason for their refusal was the influence of the so-called 'anti-vaccine' movements (and 'other'). None of the parents pointed out that the reason for the refusal was due to cultural, religious or ethnic beliefs, the influence alternative medicine subculture, or the fact that unwanted post-vaccination reactions occurred in the immediate family. It should be emphasised that each refusal was associated with an attempt to

enter into a dialogue with parents by the doctor, but the survey itself was completed independently, without the participation of health care professionals. Most parents had secondary education, some were educated at a higher level, and only 3.3% of mothers and 2.2% of fathers did not have any education (Fig. 1).

## DISCUSSION

The obligation of preventive vaccinations has been functioning in Poland for several dozen years, and the list of contagious diseases against which there are obligatory vaccinations is specified in the regulation of the Minister of Health. At present these diseases are: diphtheria, tuberculosis, *Haemophilus influenzae* type b infection, *Streptococcus pneumoniae* infection, whooping cough, widespread parotitis (mumps), chickenpox, measles, rubella, poliomyelitis, tetanus, hepatitis B, and rabies. For each of the above-mentioned diseases specific groups of people obliged to undergo vaccination were defined [8]. Dates of vaccinations are included in the Protective Vaccination Program adopted by the Chief Sanitary Inspectorate. It is systematically modified in accordance with current medical knowledge, as well as the financial possibilities of the budget of the Ministry of Health. The first vaccinations to which a newborn is subject in the first days of his/her life are against hepatitis B and tuberculosis [9].

Such early vaccination aims to protect the newborn as soon as possible against the aforementioned diseases. From the first hours and minutes of life, the newborn has contact not only with the mother, but also with the medical staff surrounding him/her or visiting the hospital ward. Obviously only healthy children or with no medical contraindications for vaccination are vaccinated. In other cases, this vaccination is postponed until it is feasible to comply with all standards and guidelines aimed at the health and safety of the child [8]. Justification supported by statistical data for the performance of vaccination against hepatitis B and tuberculosis in the first days of life may be found below. The latest recommendations demonstrate that infants born before 37 weeks of pregnancy should receive vaccinations appropriate to their chronological age, on the same vaccination schedule as full-term newborns [10].

Based on 2017 data, the incidence rate for tuberculosis in Poland is 15.1/100,000 [11]. The following European Union countries have worse indicators: Romania (66.2/100,000), Lithuania (48.7/100,000), Latvia (28.3/100,000), Bulgaria (20.6/100,000), and Portugal (17.5/100,000) [12].

According to the current recommendations of the International Union Against Tuberculosis and Lung Diseases, discontinuation of mandatory vaccinations can be made when the abovementioned index is < 5/100,000 positive sputum smear result. In 2017, 2472 tuberculosis cases were smear-positive in Poland, which means

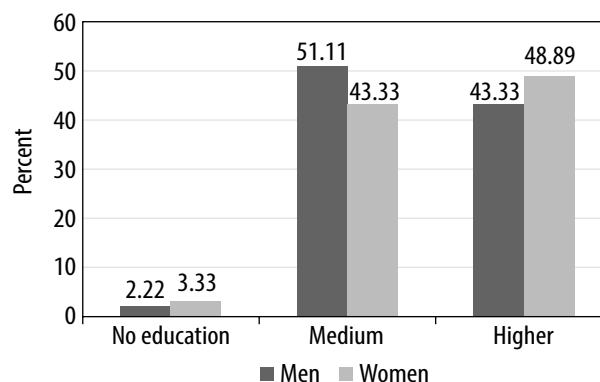


FIGURE 1. Educational level structure among parents not agreeing to vaccinate their children against tuberculosis and/or hepatitis B

an incidence of 6.4/100,000 [11]. In light of the above information, it can be concluded that Poland is not eligible for the cessation of TB prevention in the form of preventive vaccination. Because of the immaturity of the immune system, the group especially exposed to severe clinical forms of these diseases are young children, i.e. up to three years of age. In this case, the development of tuberculous tuberculosis or tuberculous meningitis is not uncommon [13].

Current studies indicate a reduction in the risk of both pulmonary and miliary tuberculosis, as well as tuberculous meningitis in BCG-vaccinated groups, compared to controls [14].

Vaccine against hepatitis B provides long-term (> 20 years) protection against infection and its consequences [15]. According to the WHO guidelines, the first dose should be given to the child immediately after birth (preferably < 24 hours). Importantly, this recommendation covers all regions, even those with low endemicity. Administration of the vaccine immediately after birth (and within a maximum of 72 hours) also significantly reduces the risk of infection among newborns of HB-positive mothers compared to those who received it only after seven days. Moreover, it allows minimisation of the risk of infection in the case of children of mothers who do not know that they are carriers of the virus, and thus fill the gaps in screening programs [16]. Vaccination is safe and generally well tolerated. This also applies to newborns. About 1/3 of those vaccinated may have pain and redness at the injection site. Occasionally, mild fever and general malaise may occur. These complaints mainly concern older children and have a mild course. They resolve spontaneously [17].

Paying attention to the phenomenon of vaccination refusals among parents of newborns is particularly important. It allows, even at such an early stage, indication of the families of children who are not likely to be vaccinated for further infectious diseases included in the immunisation program and who may be included in the group of children who are particularly vulnerable. At the same time, such children become a real danger for peo-

ple they come into contact with who have not been immunised due to health contraindications. On the other hand, early access to families that evade the obligation to vaccinate children also means that they can be given special supervision in terms of pro-vaccination activities.

Such monitoring of population attitudes towards vaccination is extremely important because even a small group of people who refuse to vaccinate may have a disproportionately large negative impact on the collective resistance and spread of pathogens that cause potentially very serious infectious diseases [18].

As mentioned earlier, the level of vaccination in Polish society is still at a sufficiently high level to prevent epidemiological safety, except the prevention of the measles.

However, an inspection report on the Children Vaccination System carried out in 2014 by the Supreme Audit Office indicates that we can deal with drastically low figures because about half of the controlled health service providers did not give information about persons who evaded compulsory vaccinations or those reports were incomplete (e.g. no lists containing personal data) [6].

On the other hand, enforcement actions carried out by local sanitary inspectors against parents of children evading vaccinations were insufficient and ineffective.

An important issue is also to clarify the operation of the Adverse Vaccination Reaction information system, mainly regarding the date and manner of submitting data on heavy adverse vaccination reaction [9].

## CONCLUSIONS

Our own experience based on a three-year observation at the Women's and Children's Health Centre in Zabrze (2014–2017) indicates that the number of refusals of vaccination against hepatitis B and tuberculosis in healthy and eutrophic newborns, expressed by parents during hospitalisation right after birth, is increasing.

Observations indicate that almost every 40<sup>th</sup> newborn is not vaccinated according to the will of their parents.

It seems that the parents are already deciding about not-vaccinating before they give birth, which can be demonstrated by the statements they present at the time of admission to the hospital and the lack of acceptance of the position of doctors looking after newborns.

Most parents do not justify the reasons for their decision, although they have such a possibility in the appropriate section in the obligatory questionnaire.

Among parents refusing to vaccinate their child, people with secondary and higher education level dominate.

The analysis of scientific literature shows that in Polish literature so far there is no such data on refusals by parents of compulsory vaccination in newborn children.

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## DISCLOSURE

The authors declare no conflict of interest.