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Violation of the Child Vaccination Calendar: the Attitudes of Doctors and Parents

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Article received: 19.02.2015. Accepted for publication: 05.05.2015.

*The **aim** of this publication is a comparative analysis of the attitudes of paediatricians and parents towards vaccination and the vaccination calendar. **Methods.** An online poll among mothers of children under the age of was carried out. 315 women at the age of 20–45 took part in the poll. They were all questioned about their attitude towards vaccination and the adherence to the vaccination calendar. 42 paediatricians contributed their opinion on the subject of vaccination calendar violations, unjustified medical rejections and the vaccination of their own children and themselves. **Results**. The poll revealed a lack of correspondence between the parents' idea of vaccination and the paediatricians' attitudes towards vaccination calendar violations. **Conclusion**. Educational programs for doctors and parents covering the topic of vaccination can provide an effective resistance to the present anti-vaccination lobby. At the moment, the key issues are the necessity to decrease unjustified medical rejections for vaccinations, a continuous attention to the child's vaccination status (at any addressing) and informing the parents about the diseases which can be prevented through immunization.*
***Key words**: vaccination, anti-vaccination campaign, National Vaccination Calendar, children, vaccination, educational programmes for doctors.*
(***For citation*:** Kulichenko T.V., Dymshits M.N., Lazareva M.A., Babayan A.R., Bokuchava E.G. Violation of the child vaccination calendar: the attitudes of doctors and parents. *Pediatricheskaya farmakologiya = Pediatric pharmacology*. 2015; 12 (3): 330–334. doi: 10.15690/pf.v12i3.1361)

TOPICALITY

Vaccinal prevention has existed for more than 200 years. The advisability and safety of vaccination is subject to discussion since the first experiments of E. Jenner and L. Pasteur. The history of vaccine development and application contains a lot of tragedies related to manufacturing failures, unexpected activity of pathogenic factors, imperfectness of drug inactivation and purification. As the knowledge base of immunology and microbiology was enhanced and enlarged, vaccines and vaccine manufacturing technology evolved in a very impressive fashion.
Life expectancy in developed countries increased by 30 years in the 20th century, 25 of which are the gift of vaccine prevention to humanity, top pediatricians of our country and global experts believe [1]. New vaccines have been invented over the last two decades, resulting in expansion of immunoprophylaxis. Developed countries are eager to introduce new vaccines.

Thanks to joint efforts of the World Health Organization and UNICEF, G8 and private donations, developing countries gain access to vaccination, too.

The whole world has recognized the efficiency of vaccination. It is the most significant healthcare program, which has drastically reduced the morbidity and mortality rates of many infectious diseases like variola, polio, diphtheria, and measles. However, fear of vaccinal reactions and complications overwhelmed people worldwide almost two centuries ago, right after they started anti-variola vaccination. It is the pillar upon which the today's anti-vaccine attitude rests [2].

Even if you do not pay attention to the aggressive (and, unfortunately, unpunished) anti-vaccine campaign in mass media, which has long been causing panic and instilling the idea of "murder vaccines", you can see one more layer of anxious or concerned attitude of people to immunization. When asked why their children should not be administered vaccines, parents often say most diseases have already been won or are not serious, that children receive "too many" vaccines at once, that preservatives used in vaccines are dangerous, that there is a global conspiracy of pharmaceutical companies, physicians, and government, and that "many of our friends did not allow to administer vaccines to their children, and actually nothing bad happened." These are usually the arguments of under-educated or badly informed people. Upon a doctoral visit, they are actually ready to discuss why vaccination is needed, and they can even take competent professional advice into consideration. What is needed is the physician's desire to convince parents and dispel their fears. If is also a frequent case that if asked whether the child should be vaccinated, the physician advices parents "not to do it for some time." There arises a question whether we, physicians, are ready to explain to parents the usefulness of vaccination, stimulate and support their motivation to be compliant with the vaccination schedule, and, most importantly, whether we should make such efforts or parents already have formed a clear and well-established anti-vaccinal attitude?

The **objective** of this publication is comparative analysis of attitude of parents and pediatricians to vaccinal prevention and vaccinal prevention schedule.

METHODS

From October 17 to 21, 2014 we surveyed 315 20-to-45-year-old women living in Russia and having children under 5. They were asked the following.

1. Check the vaccines against children diseases you are familiar with.
2. Which of these diseases your child has survived at least once (if you have more than one child, then take the statistics on the youngest one)?
3. In each region of Russia, there is a pediatric vaccination schedule. Do you know about it?
4. Which diseases have you vaccinated your child against, at least once (if you have more than one child, take the statistics on the youngest one)?
5. Is your child's health insured (beside basic mandatory healthcare insurance)?
6. Where was your child vaccinated last time?
7. Who ensures your child's compliance with the vaccination schedule (if you have more than one child, take the youngest one)?
8. Assess how do you agree or disagree with each of the following statements:

- prophylactic vaccines are administered to my child on a regular basis in accordance with the vaccination schedule;
- prophylactic vaccines are administered to my child in a timely fashion in accordance with the vaccination schedule;
- children have to be vaccinated;
- children should not be vaccinated at all.

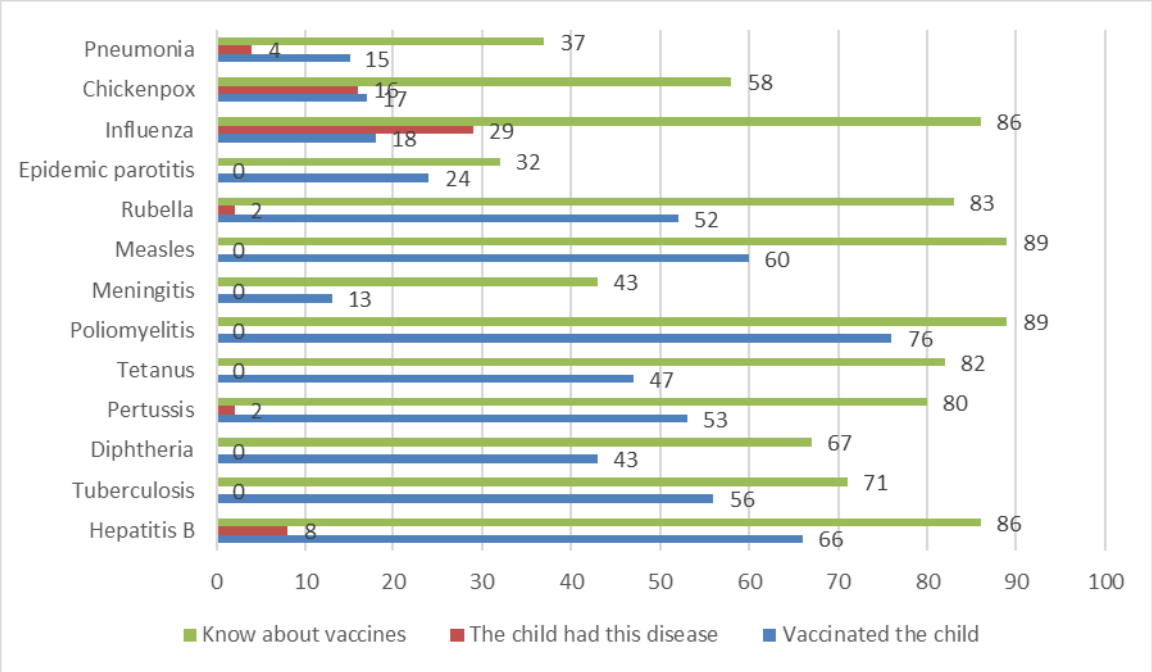
Pediatrician Survey on Vaccination Schedule Disruptions

42 pediatricians of the Scientific Center of Children's Health were surveyed, with 2 to 30 years of experience. The survey was conducted in November 2014. The participants were offered an anonymous survey, which included open questions on vaccination schedule disruptions, unreasonable exemptions, and attitude to self-vaccination and vaccination of their own children.

RESULTS

The survey showed that 67 to 89 percent of surveyed mothers know that children can be vaccine-protected against hepatitis B, tuberculosis, diphtheria, pertussis, tetanus, measles, rubella and influenza (Fig. 1). Poor knowledge of vaccination against epidemic parotitis is most likely not true; such results are probably due to the fact this term is little-known, because non-physicians mostly refer to this disease as mumps. Mothers are familiar with such diseases as influenza, pneumonia, varicella, hepatitis B, rubella, and pertussis, as 2 to 18 percent of our participants' children have already survived these diseases.

Fig. 1 ***Data on Survey of 315 Mothers: Knowledge of Vaccines, Disease Experience, Pediatric Vaccination***



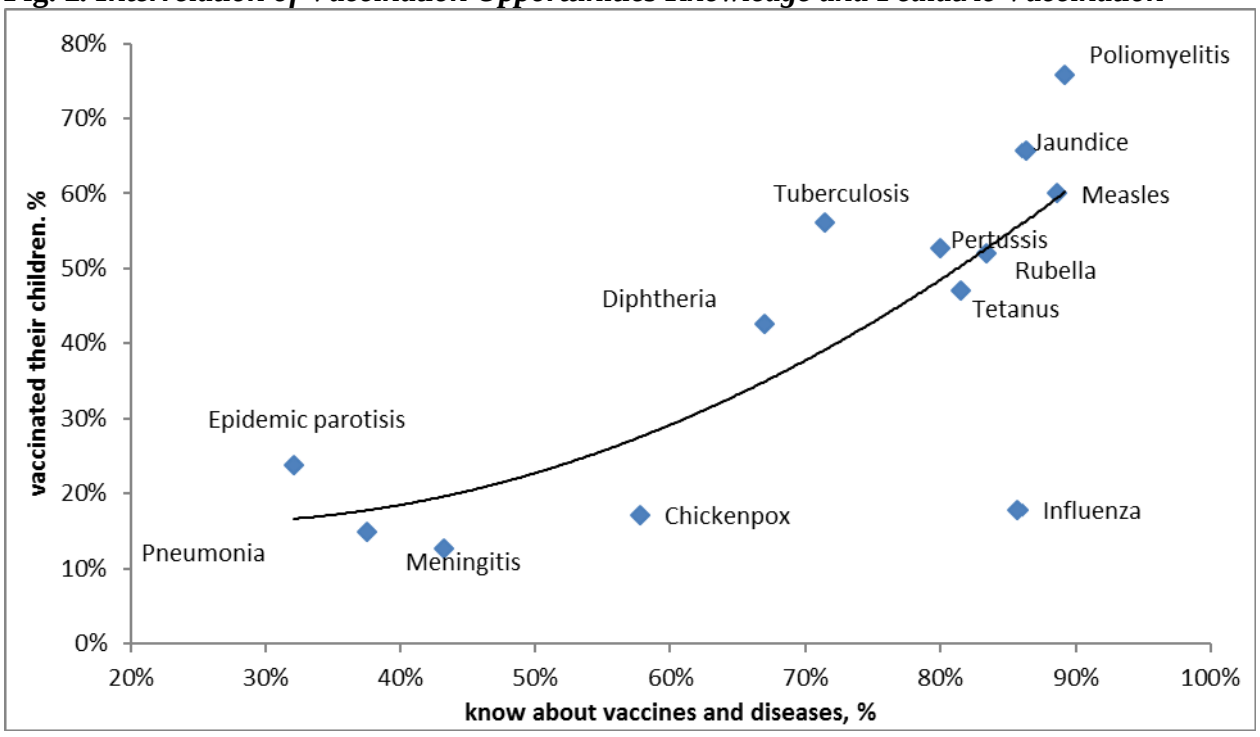
At the same time, their knowledge of vaccines is not based on their own negative experience of survived diseases. Parents have far better knowledge of vaccines included in the National vaccinal prevention schedule. Less than half of parents are aware their children can be vaccinated against pneumonia, meningitis, and varicella. It is important to note that the pneumococcal vaccine had already been added to the schedule by the time of this survey, but only 37% of the participants were aware of its existence, and only 15% of families had vaccinated their children therewith.

It is interesting that those the number of people aware of these vaccines and diseases was always greater than the number of those who had already vaccinated their children against those diseases. Given the fact that the surveyed women's children differed in age, this situation could not always be explained simply by stating they "hadn't had time to do that so far." For the vaccines included in the schedule, the discrepancy between the I Know and Have Already Vaccinated responses was less significant than for non-scheduled vaccines. Children are less often vaccinated against the diseases the vaccinal prevention of which is not mandatory (meningitis, varicella), or has been added to the schedule recently (pneumonia), or is done upon

specific indications (influenza). It should be noted that 86% of mothers are aware of anti-influenza vaccination, but only 18% actually vaccinate their children. It is obvious that anti-influenza vaccination is least popular, given its accessibility and relatively low price.

Parents' knowledge of diseases and possible vaccinal prevention correlates to vaccinating their own children (Fig. 2). Influenza is the one exception, everybody knows it, but people are unwilling to get vaccinated against it and rarely do so. The knowledge of vaccinal prevention opportunities outside the scope of the schedule was the poorest. Outraging is the extremely low number of parents aware of opportunities to vaccinate their children against pneumococcal and meningococcal infections.

Fig. 2. ***Interrelation of Vaccination Opportunities Knowledge and Pediatric Vaccination***



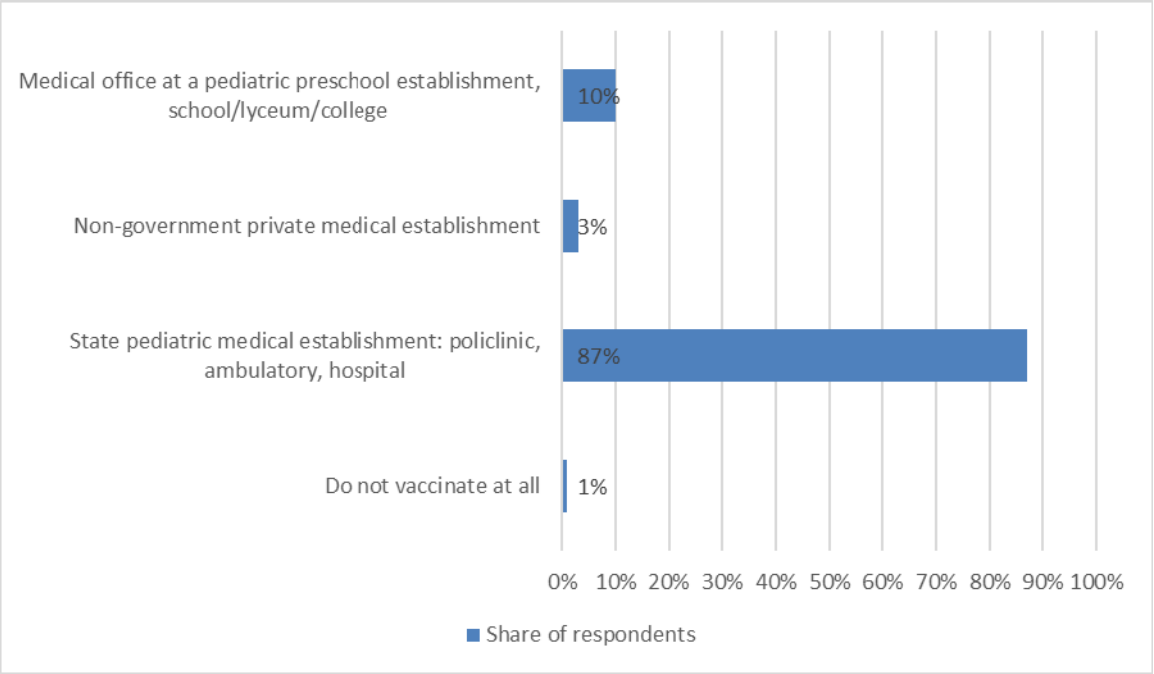
In general, 82% of the surveyed mothers are aware of the National vaccinal prevention schedule. Almost all children are vaccinated at state healthcare institutions (Fig. 3). It is notable that only 3 participants (1%) claimed they never vaccinate their children. Therefore, there are not so many die hard opponents of vaccination.

Only a quarter of parents control their children's compliance with vaccinal prevention schedules on their own (Fig. 4). In all the other cases, parents believe it is doctors and nurses in charge that should ensure compliance with the schedule.

Most participants claimed their children were vaccinated in accordance with the vaccinal prevention schedule on a regular basis (80%) and in time (78%; table 1). Only 4% of the survey participants were in doubts whether it was worth it to vaccinate their children against diseases. Mothers' commitment to the timely immunization of their children depends on such children's age.

The surveyed mothers who had children under five showed rather positive attitude to vaccinal prevention; only one percent of the surveyed mothers refused to vaccinate their children.

Fig. 3. ***Where was you child vaccinated last? Replies.***



Note. 1% - 3 persons.

Fig. 4. ***Who ensures your child is compliant with the vaccination schedule?***

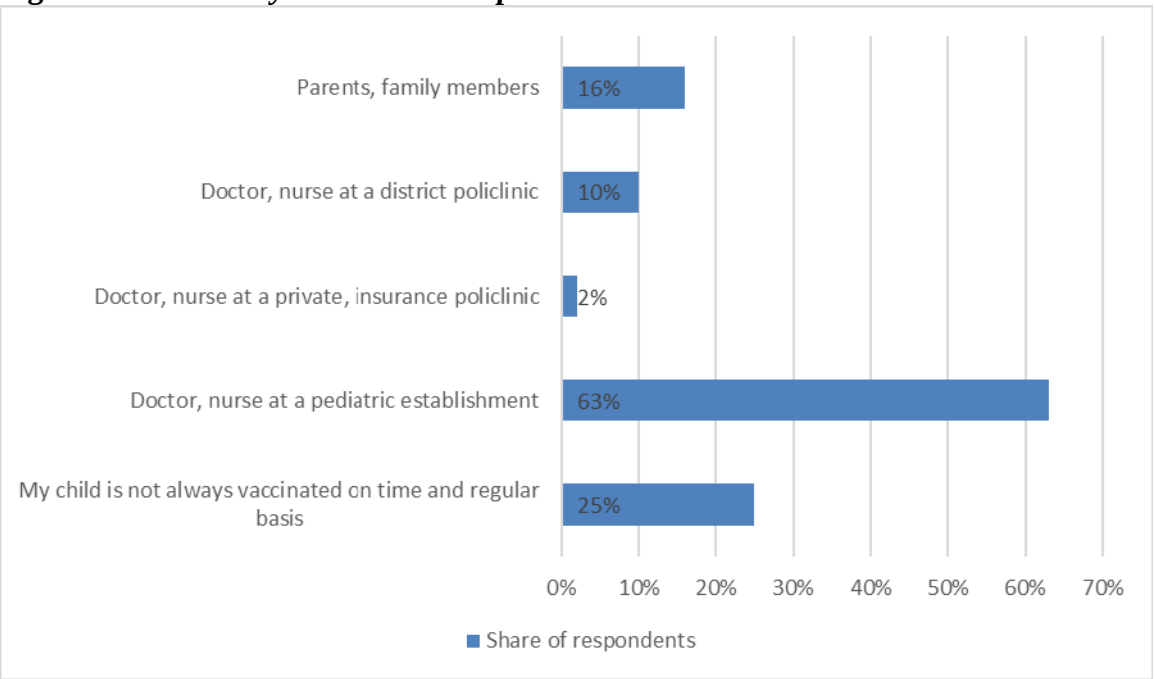


Table 1. ***Maternal view of compliance with vaccination schedule and vaccination necessity for their children, %***

Statements	**Absolutely disagree**	**More like disagree**	**Cannot answer**	**More like agree**	**Absolutely agree**
My child is vaccinated on a regular basis	8	8	5	26	54
My child is vaccinated in time	8	8	6	27	51
Children have to be vaccinated	4	3	6	34	53
Children should not be vaccinated at all	67	19	12	2	2

Pediatrician Survey on Vaccination Schedule Disruptions

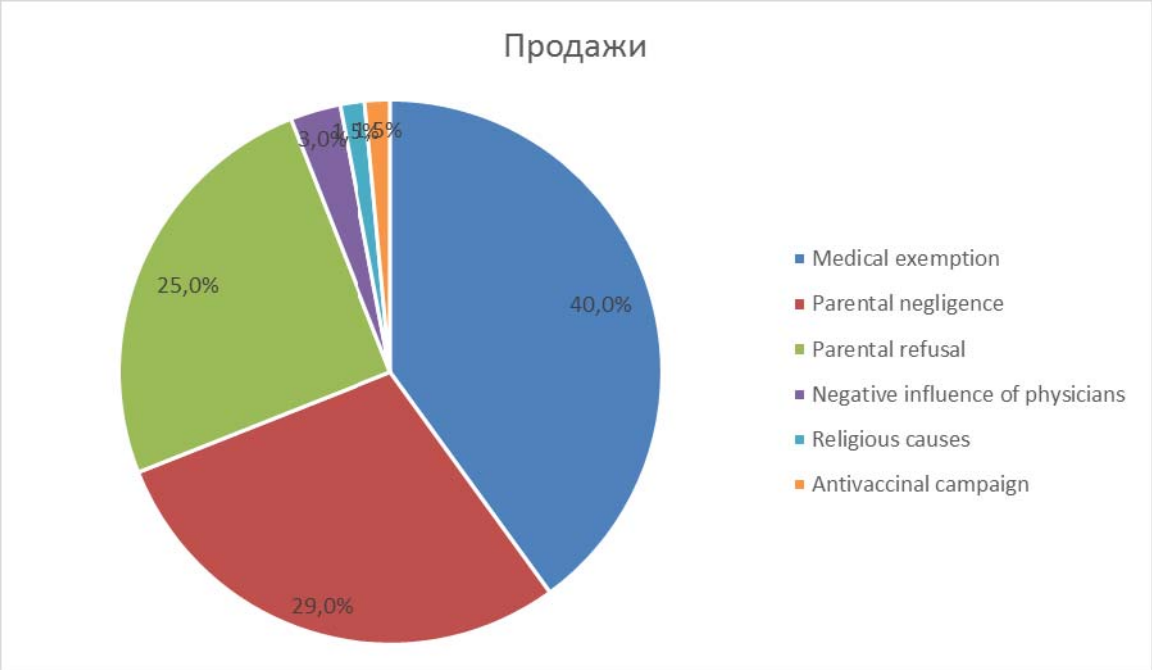
Of all the pediatricians surveyed, 24% claimed they often encountered such mothers that refused to vaccinate their children; only 17% of pediatricians said such patients were rare.
Among the most frequent causes of vaccinal prevention schedule disruptions, physicians named medical exemptions (40%), parents' negligence and careless attitude to vaccination (29%), and parents' refusal to vaccinate (23%). Such factors as religious beliefs, anti-vaccinal campaigning, or physicians' negative opinions cause far less disruptions, pediatricians believe (Fig. 5).
Vaccinal counterindications in children due to health conditions require additional discussion. Medical exemptions are the most frequent reason for vaccinal schedule disruptions. Table 2 gives data on **unreasonable medical exemptions** from vaccination, encountered by pediatricians in their work.

Table 2. ***Unreasonable medical exemptions from vaccination (based on pediatricians' survey)***

• Atopic dermatitis
• Frequent acute respiratory viral infections
• Non-recrudescent allergic diseases
• Child's medical history indicates allergic responses, obstructive bronchitis, pyelonephritis, urinary tract infection, respiratory infection having occurred 1 to 4 months ago
• Another family member has (had) respiratory viral infection
• Hypoxia at birth
• Mild/residual neurological symptoms
• Neutropenia (any)
• "Let the child's health strengthen by age of year; he/she will be vaccinated then"
• Complication induced by another vaccination
• Vaccination-triggered response in other children of the family, at any time
• Anemia
• Thrombocytes at the upper normative limit
• "Bad" urine tests, minimum deviations in the leukocyte count
• Vesicoureteral reflux
• Non-recrudescent chronic disease
• Benign hematuria
• Mother's pregnancy (exemption from measles and rubella vaccination)

As for medical exemptions allowed by the surveyed physicians **themselves**, there was a limited range of reasons to disrupt the schedule, which is in accordance with the commonly accepted counterindications, i.e. acute respiratory infections, chronic disease recrudescence, autoimmune disease, and immunosuppressive therapy, severe neurological symptoms, and vaccine-induced allergies. We can conclude that the surveyed physicians are well aware of counterindications and indications for vaccination, and are capable of determining whether a medical exemption is "unreasonable",. i.e. is outside the scope of standard recommendations. However, in the real-world clinical settings there may emerge situations where the physician is well familiar with indications and counterindications for vaccination, but anyway offers to postpone vaccination and proves their point of view with such implausible like "let us first strengthen the child's health" or "let him/her grow a bit more" (Fig. 5), which only reinforces the parents' fear and lack of confidence.

Fig. 5. ***What pediatricians believe are the most frequent reasons for vaccination schedule disruptions***



According to our survey, its participants were mostly positive towards vaccinal prevention. 100% of the surveyed physicians vaccinate or were going to vaccinate their own children, 97% of these physicians had been vaccinated against hepatitis B*, 64% against influenza.

DISCUSSION

A comparative analysis of these two surveys gives food for thought. On the one hand, physicians think that in most cases, it is the parents' fault there is no compliance with the vaccinal schedule (54%). On the other hand, only a small number of parents actually refuse to vaccinate their children, and the numbers of such "vaccination is a no-go" parents are not bigger percentage-wise than in developed countries. What is more, most parents entrust physicians with control over vaccinal prevention schedules of their children. These facts are not counterarguments against the stated issues of refusal to vaccinate, of parents' fear of vaccines; however, one should make proper emphasis. There are not so many die hard opponents of vaccination. Most parents are **prone to cooperate** with physicians when it comes to vaccination.

Why is it important to emphasize that point? The point is, it makes little to no sense to bust the already well-established myths. Psychologists have carried out dozens of experiments only to conclude people rarely or never abandon their favorite views and beliefs, even if bombarded with undisputable facts and proofs (Charles Lord, 1979) [3]. Quite the contrary, they react extremely negatively to the facts and scientific evidence that invalidates their delusions. In such cases, "pro" evidence can be perverted and transformed into "contra" evidence. In 2013, Brendan Nyhen et al. published the results of their three-year study, in which pediatricians and politologists had tried to find the way(s) to influence parents' already formed prejudice towards pediatric vaccination. They have tried various emotional and rational techniques to determine people to act in a certain way. Different techniques were tested in different groups. They included special brochures that contained details on why infections are so dangerous; scientific research that concluded autism is not related to vaccines; photos of disease-disfigured children; and horror stories of children deceased of measles. None of these techniques had positive effects on parents' readiness to vaccinate the children; in some groups, the effect was contrary [4].

The same researchers found out that if a person under delusion or in doubts is trained to improve their self-esteem, it can help re-define or even refute their false views. Therefore, those whom

we want to convince should first of all rest assured, if we are to succeed. It won't do to "demonize" parents to refuse to vaccinate their children. Moreover, one should first of all find out who are die hard opponents of vaccination, and who are actually in doubts and need additional education and comprehension.

It is erroneous to believe half of parents are unwilling to cooperate when it comes to pediatric vaccination. Most likely, they are not compliant with the vaccination schedule due to lack of physicians' attention to the issue. One should identify parents' true stance and knowledge in relation to vaccination, a time-consuming and patience-intensive task. It is extremely important to explain in details why and how children should be vaccinated; parents should be warned about possible vaccinal responses without being frightened. It will require even greater motivation and time dedication on the part of the physician. When should one discuss the issue with the parents? Anytime, upon any visit, regardless of its reason. Physicians should always pay attention to children's vaccinal status. It is no surprise to anyone that children are weighted upon each doctoral visit, because children grow in both height and body mass. Vaccinal status is subject to alterations, too. If a child survived a viral disease, and their vaccination was postponed, someone should check whether the child was vaccinated thereafter; it may well be the case their parents were cast in doubts or received negative advice, and stopped vaccinating the child.

The fact that physicians pay insufficient attention to this issue is implicitly confirmed by parents' poor knowledge of "non-scheduled" vaccines. Despite opportunities of vaccinating children additionally against severe and unpleasant diseases, these topics are not subject to thorough discussion with parents. Physicians' inertia is great thereby, as the pneumococcal vaccine is scheduled in the schedule, but parents are not well-informed on it. Such lack of knowledge will delay mass vaccination.

Different schedule disruptions are mostly due to medical exemptions, not parental resistance. This is why we would like to pay special attention to this issue. As we have demonstrated above, physicians become really creative when they need to find an excuse for non-vaccination (see Table 1). It is easy to explain. Each medical exemption from vaccination guarantees the physician will avoid possible consequences of adverse vaccinal responses. But it leaves patients unprotected against the diseases, at prevention of which the whole world's immunoprophylaxis programs are aimed.

To be more precise, there are two vaccination counterindications. These are conditions that increase the risk of severe adverse events; and conditions that make it difficult to interpret such events should they emerge in the post-vaccinal period [1]. Such conditions are well-described for every vaccine. They require utmost compliance and are listed by the Healthcare Ministry of Russia; they are contained in vaccinal manuals and other vaccination-related papers [5]. Acute infectious diseases and recrudescence of many chronic diseases are temporary counterindications for immunization; however, it is medical exemptions cause months-long, or even years-long schedule disruptions.

CONCLUSION

The conducted survey revealed discrepancy between the parental vision of vaccinal prevention and attitude of pediatricians to non-adherence to the vaccinal prevention schedule. We believe the existing anti-vaccinal lobby can be fought efficiently by means of **immunoprophylaxis-related educational training for physicians**, as well as by subsequent parental courses. The key points are reducing the numbers of unreasonable medical exemptions, always paying attention to children's vaccinal status upon every visit, and informing parents on diseases their children can be protected against by vaccination today.

CONFLICT OF INTEREST

T.V. Kulichenko has received research grants from Pfizer and Abbott, and has also received a speaker fee from Merck, Abbott, Pfizer, Novartis, GlaxoSmithKline, and Satius.
M.N. Dymshits, M.A. Lazareva, and A.R. Babayan have indicated they have no financial relationships / conflict of interest relevant to this article to disclose.

ACKNOWLEDGEMENT

We thank Tat′yana Golovacheva, the Research Director of the consulting company Dymshits and Partners who provided the maternal online survey that greatly assisted the research, and our colleagues – the pediatricians – from the Scientific Center of Children's Health for their participation.

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