

Vaccination in family medicine practice

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Vaccination is the most effective measure against infectious diseases. Due to vaccinations, smallpox was eliminated, poliomyelitis and tetanus morbidity decreased dramatically. According to WHO, 12 million children around the world annually die from infectious diseases. Of these, 7.5 million lives are lost to diseases against which we do not yet have vaccines, but more than 4 million people die from preventable diseases. Immunization is currently considered to be one of the most effective and cost-effective medical interventions in the epidemic process. The more economically developed a country is, the more diseases its population should be vaccinated from with the help of immunoprophylaxis. In order to create herd immunity, WHO recommends that at least 95% of individuals should be vaccinated. However, in the Lviv region and Ukraine there is a negative tendency to reduce the coverage of preventive vaccinations up to 45–53%, which is a danger of the emergence and epidemic spread of preventable diseases.

The objective: was to analyze the legislative framework on immunoprophylaxis, the peculiarities of planning preventive vaccinations, the requirements for vaccination offices and modern contraindications for vaccination.

Materials and methods. Legal documents on immunoprophylaxis were analysed, 210 family doctors were surveyed on immunoprophylaxis awareness. *Conclusions.* There is a necessity of continuous professional development of physicians on immunoprophylaxis, including training, theoretical improvement courses, internships in European countries and Ukrainian vaccination centers.

Key words: vaccination, family doctor, contraindications, vaccination conditions.

Вакцинація у практиці сімейного лікаря

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Вакцинація є найбільш дієвим заходом у боротьбі з інфекційними хворобами. Завдяки щепленням була ліквідована натуральна віспа, різко знизилась захворюваність на поліомієліт, правець. Згідно з даними ВООЗ, щорічно у світі від інфекційних захворювань гине 12 млн дітей. З цього числа 7,5 млн життів втрачається за рахунок захворювань, проти яких ми поки не маємо вакцин, але більше 4 млн людей помирають від хвороб, яким можна запобігти. Імунізація вважається одним із найбільш ефективних та економічно доцільних серед заходів медичного втручання в епідемічний процес, які сьогодні існують. Чим більш економічно розвинена держава, тим від більшої кількості хвороб захищає населення шляхом проведення імунопрофілактики. Для того щоб створити колективний імунітет, ВООЗ рекомендує здійснювати щеплення не менше 95% осіб. Проте у Львівській області та Україні загалом склалася негативна тенденція зниження охоплення профілактичними щепленнями до 45–53%, що є небезпекою виникнення та епідемічного поширення імунокерованих хвороб.

Мета дослідження: аналіз законодавчої бази з питань імунопрофілактики, особливості планування профілактичних щеплень, вимоги до кабінетів щеплень та сучасні протипоказання до вакцинації.

Матеріали та методи. Опрацьовано нормативно-правові документи з питань імунопрофілактики, проведено анкетування 210 сімейних лікарів з питань обізнаності щодо імунопрофілактики.

Заключення. На сьогодні існує необхідність у безперервному професійному розвитку лікарів з питань імунопрофілактики, у тому числі шляхом проведення тренінгів, курсів теоретичного удосконалення, стажування у країнах Європи та українських центрах вакцинації.

Ключові слова: вакцинація, сімейний лікар, протипоказання, умови проведення щеплень.

Вакцинация в практике семейного врача

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Вакцинация является наиболее влиятельным способом борьбы с инфекционными болезнями. Благодаря прививкам была ликвидирована натуральная оспа, резко снизилась заболеваемость полиомиелитом, столбняком. По данным ВОЗ, ежегодно в мире от инфекционных заболеваний погибает 12 млн детей. Из этого числа 7,5 млн смертей происходит за счет заболеваний, против которых мы пока не имеем вакцин, но более 4 млн человек умирает от болезней, которые можно предотвратить. Иммунизация считается одним из самых эффективных и экономически целесообразных среди мероприятий медицинского вмешательства в эпидемический процесс, которые существуют в настоящее время. Чем более экономически развито государство, тем от большего количества болезней оно защищает население путем проведения иммунопрофилактики. Для того чтобы создать коллективный иммунитет, ВОЗ рекомендует осуществлять прививки не менее 95% лиц. Однако во Львовской области и Украине в целом сложилась негативная тенденция снижения охвата населения профилактическими прививками до 45–53%, что вызывает опасность возникновения и эпидемического распространения болезней, для профилактики которых есть вакцины.

Цель исследования: анализ законодательной базы по вопросам иммунопрофилактики, особенности планирования профилактических прививок, требования к кабинетам прививок и современные противопоказания к вакцинации.

Материалы и методы. Обработаны нормативно-правовые документы по вопросам иммунопрофилактики, проведено анкетирование 210 семейных врачей по вопросам осведомленности относительно вакцинации.

Заключение. Сегодня существует необходимость в непрерывном профессиональном развитии врачей по вопросам иммунопрофилактики, в том числе путем проведения тренингов, курсов теоретического усовершенствования, стажировки в странах Европы и украинских центрах вакцинации.

Ключевые слова: вакцинация, семейный врач, противопоказания, условия проведения прививок.

According to the National Vaccination Calendar, vaccination against 10 infectious diseases is required in Ukraine: diphtheria, tetanus, whooping cough, measles, mumps, poliomyelitis, tuberculosis, hepatitis B, rubella and hemophilic infection [4]. As of October 1st, 2019, according to the information of the Centre of Public Health of MOH of Ukraine,

59.5% of children under one year of age and 52.3% of adults were vaccinated among the required amount of scheduled vaccination. In total, only 200,000 children under the age of one and 1.5 million adults were vaccinated during this period. This situation is extremely dangerous and needs immediate response in order to prevent outbreaks of infectious diseases.

The objective: was to analyze the legislative framework on immunoprophylaxis, the peculiarities of planning preventive vaccinations, the requirements for vaccination offices and modern contraindications for vaccination.

MATERIALS AND METHODS

Legal documents on immunoprophylaxis were analysed, 210 family doctors were surveyed on immunoprophylaxis awareness with the help of Google platform.

At present, a vaccine is a medical immunobiological preparation designed to create specific immunity to an infectious disease. Vaccines are made from weakened or inactivated microorganisms, their byproducts or antigens obtained by genetic engineering or chemical methods.

Modern vaccines are divided into the following groups:

a) vaccines made from living pathogens with impaired virulence (against smallpox, tuberculosis, plague, anthrax, rabies, polio (oral), etc.);

b) vaccines inactivated from killed pathogenic microbes (cholera, typhoid, pertussis, polio, leptospirosis, etc.);

c) anatoxins (made from exotoxins of the respective pathogens, processed with a 0.3–0.4% formalin solution and kept at a temperature of 38–40 °C for 3–4 weeks);

d) chemical vaccines (they are not made from whole bacterial cells, but from chemical complexes made by processing cell suspension with special methods;

e) genetically engineered (against viral hepatitis B).

Besides antigens that cause the immune response, vaccines contain a large number of other substances, including solvents, stabilizers, culture media components, preservatives, adjuvants, antibiotics. [5]. The legal documents regulating immunoprophylaxis measures in Ukraine are:

– Law of Ukraine N 2802-XII from 19/11/1992 'Fundamentals of the legislation of Ukraine on health care', Article 10. Citizens of Ukraine are obliged to: a) take care of their health and the health of children, not harm the health of other citizens; b) undergo preventive medical examinations and be vaccinated in cases provided by law. Article 78. Professional duties of medical and pharmaceutical workers. Medical and pharmaceutical workers are obliged: a) promote the protection and promotion of human health, prevention and treatment of diseases, and provide timely and qualified medical and therapeutical care.

– Law of Ukraine № 4004-XII 24/02/1994 'On ensuring the sanitary and epidemic well-being of the population'. Article 5. Citizens are obliged to take care of their health and the health and hygienic education of their children, not harm the health of other citizens; undergo compulsory medical examinations and be vaccinated in cases provided by law.

– Law of Ukraine № 1645-III from 06/04/2000 'On the protection of the population against infectious diseases'. Article 12. Preventive vaccinations. Preventive vaccinations against diphtheria, whooping cough, measles, tetanus, poliomyelitis, tuberculosis are mandatory and included in the vaccination calendar. ... Preventive vaccinations of individuals who are under 15 years of age or are recognized as incompetent by law, are performed with the consent of their objectively informed parents or legal representatives. For individuals between the ages of 15 and 18, or recognized by court as having a limited capacity, preventive vaccinations are performed with their consent after providing objective information and with the consent of objectively informed parents or other legal representatives of these individuals. Article 15. Prevention of Infectious Diseases in Children's Institutions. Admission of children to educational, teaching, health and other children's institutions shall be carried out in the presence of an appropriate certificate from a health care establishment, as well as if preventive vaccinations were performed according to

the vaccination calendar and the child was not in contact with infectious patients or bacterial carriers.

In Ukraine, the organization of preventive vaccinations is performed according to

– the requirements of MOH of Ukraine from September 16, 2011 N 595, registered at the Ministry of Justice of Ukraine on October 10, 2011 as N 1159/19897 (as reviewed in the order of MOH of Ukraine from August 11, 2014 N 551) "On the Procedure for Preventive Vaccinations in Ukraine and Quality Control and Circulation of Medical Immunobiological Preparations",

– Order of MOH of Ukraine from 18.05.18 No. 947 "On Amendments to the Calendar of Preventive Vaccinations in Ukraine",

– Order of MOH of Ukraine No.2070 of 11.10.2019, registered at the Ministry of Justice of Ukraine on November 26, 2019 as No. 1182/34153 "On Amendments to the Calendar of Preventive Vaccinations in Ukraine and the List of Medical Contraindications to Preventive Vaccinations",

– Order of MOH of Ukraine No. 280 from February 1, 2019 "On Amendments to the Regulations of the Organization of Preventive Vaccinations and State Sanitary Rules and Regulations "Sanitary anti-epidemic requirements for health care institutions providing primary health care" registered at the Ministry of Justice of Ukraine from February 28, 2019 No. 213/33184,

– Order of MOH of Ukraine from 18.05.2018 No. 948 «On the Approval of the Methodology for determining the need for Immunobiological Preparations and Medical Products used for Preventive Vaccinations ...»

Thus, the calculation of all data in the planning of preventive vaccinations and requirements for immunobiological preparations is performed using electronic resources. The WHO Tool is used to calculate the need for immunobiological preparations (vaccines) and medical devices for additional vaccination activities. The Tool calculates the requirement for years with a maximum planning period of 3 years, with the possibility of calculating 10 additional measures involving vaccination [6].

Performing preventive vaccinations requires a Vaccination Point, which can be either permanent or temporary (for 24 hours). The permanent vaccination point must be equipped with:

- a refrigerator for storing vaccines and anatoxins;
- a thermometer in the refrigerator on the second shelf and a thermometer to validate its readings;
- refrigerator bag with two sets of cold storage elements and a thermometer;
- a table for the refrigerator bag, injection materials and a box for safe disposal of syringes;
- sets of medicines and medical supplies and first aid kits for emergency medical care;
- a box for safe disposal of syringes;
- a couch for preventive vaccination and swaddling of the baby as required, or a chair;
- equipped area for hand hygiene (water, soap), dispenser with antiseptic for treatment of skin of the hands;
- a bactericidal irradiator or other device for air disinfection;
- information materials, vaccination posters, and educational guides, including visuals for emergency medical care that may occur after the administration of immunobiological preparations (if possible);
- indoor thermometer.

Temporary vaccination points can be equipped without a refrigerator; it is enough to have two refrigerator bags with thermometers and a corresponding number of cold elements depending on the volume of vaccines [7].

Who should be vaccinated by a family doctor? A family doctor vaccinates children and adults requiring age-appropriate preventive vaccination according to the Calendar (Image 1).

Table 1

Preventive Vaccination Calendar

Age		Preventive Vaccination Calendar				
1 day		Hepatitis B				
3–5 days	Tuberculosis					
2–months		Hepatitis B	Diphtheria, whooping cough, tetanus	Poliomyelitis	Hemophilic infection	
4 months			Diphtheria, whooping cough, tetanus	Poliomyelitis	Hemophilic infection	
6 months		Hepatitis B	Diphtheria, whooping cough, tetanus	Poliomyelitis		
12 months					Hemophilic infection	Measles, rubella, mumps
18 months			Diphtheria, whooping cough, tetanus	Poliomyelitis		
6 years			Diphtheria, tetanus	Poliomyelitis		Measles, rubella, mumps
14 years				Poliomyelitis		
16 years			Diphtheria, tetanus			
26 years			Diphtheria, tetanus (afterwards once in a decade)			

Table 2

**Minimum Intervals between Vaccinations
For children from 2 months to 6 years 11 months 29 days**

Vaccines, anatoxins	Minimum intervals between doses		
	1–2-nd dose	2–3-rd dose	3–4-th dose
DTP-1, DTaP-1	1 month	1 month	6 months
Td	1 month	9 months	
For poliomyelitis	1 month	1 month	6 months
For hepatitis B	1 month	1 month	
For measles, mumps, rubella-	1 month		
Hib-vaccine	1 month, the 2-nd dose is not administered if the 1-st dose is administered at the age from 12 months to 4 years 11 months 29 days	6 months, the 3-rd is not administered if the 2-nd dose is administered at the age from 12 months to 4 years 11 months 29 days	

For children from 7 to 17 years 11 months 29 days

Vaccines, anatoxins	Minimum intervals between doses		
	1–2-nd dose	2–3-rd dose	3–4-th dose
Td-6	1 month	6 months	
For measles, mumps, rubella	1 month		
For hepatitis B -	1 month	1 month	
For poliomyelitis -	1 month	1 month	months

A family doctor also vaccinates children and adults who are overdue for vaccination. They are vaccinated according to the rules for Vaccination of children with calendar disruption. The basic principle is: all received doses are counted, the following are administered keeping the minimum intervals between vaccinations (Table 2).

According to the CDC guidelines and the legislation of Ukraine, 2 or less inactivated vaccines and/or anatoxins can be administered simultaneously for vaccination. Live vaccines

and inactivated vaccines or anatoxins can be administered simultaneously in different areas of the body or with any interval between doses, according to the instructions. 2 or less live vaccines for parenteral administration (except BCG) can be administered simultaneously in different areas of the body or with an interval of at least 1 month[8].

Besides the 10 infections guaranteed by the State free of charge, there are recommended vaccines that can be obtained at one's

own expense or through regional programs. The recommended vaccines include vaccination against rotavirus, influenza, meningococcal infection, pneumococcal and papillomavirus infections, chickenpox, hepatitis A and hepatitis B for adults. For pregnant women, a vaccination against whooping cough is also recommended at 27-36 weeks of gestation to protect the baby from whooping cough until the moment of its vaccination and to protect the mother. Revaccination is also recommended for all family members. This strategy is called «Cocoon». The CDC Advisory Committee on ACIP Immunization Practices recommended this strategy as early as 2011 [9]. However, this practice has not yet been widely used in Ukraine.

Among the recommended vaccines, the most widely used is the influenza vaccine. The influenza vaccination is especially needed for individuals at risk (patients with chronic respiratory and cardiovascular diseases, patients with diabetes, obesity, immunodeficiency, pregnant women, children under 5 years and people over 65) and social risk factor groups (medical, pedagogical, transportation, trade, etc.). Influenza vaccinations should be done annually as recommended by WHO, since the vaccine strain composition changes annually according to the variability of pathogens in nature. Vaccinations should be taken before the epidemic rises, but can be used against influenza and URTI. Immunity is formed within 14 days. Protection lasts from 6 months to 1 year [10].

Among the recommended vaccinations, the number of individuals vaccinated against yellow fever is increasing every year as they travel to the countries at risk – Benin, Burkina Faso, Cameroon, Congo, Ivory Coast, Gabon, Ghana, Liberia, Mali, Rwanda, Nigeria, Guinea-Bissau, Burundi, Guyana, Togo, Sierra

Leone, Caribbean, Trinidad. Vaccinations are carried out 10 days before the departure to the endemic country [11].

To date, the only absolute contraindication to preventive vaccinations is anaphylactic reaction to prior administration of this vaccine or its component. Live vaccines are contraindicated for pregnant women and those with AIDS. The relative contraindications include the period of acute illness. Increase of body temperature to 38 degrees does not justify refusal of vaccination [12].

Through the Google platform, we have conducted surveys on vaccination awareness among 210 family doctors. They were asked to complete a questionnaire on 26 questions. According to the survey, only 26% of respondents had knowledge of vaccination legislation. 63% of respondents were unaware of the possibility of creating temporary vaccination points. 18% of respondents incorrectly answered the question about the type and composition of vaccines. 53% of respondents do not consider it possible to vaccinate pregnant women against influenza. 3% of respondents do not practice the recommended vaccination at all. 13% of respondents do not administer multiple compatible vaccines during one visit.

CONCLUSIONS

Immunoprophylaxis is a state security issue. In the period of reforming medicine, the importance of a family doctor in society has increased dramatically [13]. Trust in a family doctor is the key to success of public health. Continuous professional development of family doctors in immunoprophylaxis is a required aspect of the success of the healthcare reform of Ukraine.

Сведения об авторах

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