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Preventive health of the geriatric age. Vaccinations recommended by the Ministry of Health Republic of Poland for the year 2014

Profilaktyka zdrowia osób w wieku geriatrycznym. Szczepienia zalecane przez Ministerstwo Zdrowia Rzeczypospolitej Polskiej na rok 2014 r.

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Key words: vaccination history, the types of vaccinations, preventive vaccination, vaccination calendar 2014, hepatitis A and B, varicella, influenza, diphtheria, tetanus, whooping-cough, invasive infections with Neisseria meningitidis and Haemophilus influenzae type B, tick-borne encephalitis, , cholera, typhoid, rabies, yellow fever.

Słowa klucze: historia szczepień, typy szczepień, profilaktyka szczepień, kalendarz szczepień 2014 r., wirusowemu zapaleniu wątroby typu A i B, ospa wietrzna, grypa, błonica, tężec, krztusiec, inwazyjne zakażenia Neisseria meningitidis i Haemophilus influenzae typ B, kleszczowe zapalenie mózgu, cholera, dur brzuszny, wścieklizna, żółta gorączka.

Abstract

Introduction. Preventive public health action is an important branch of the Ministry of Health. Every year, the Ministry of Health Communication Chief Sanitary Inspector shows Immunization Program (PSO) consists of three parts-vaccination schedule, vaccinations recommended and supplementary information. PSO for the year 2014 was presented in the Communication Chief Sanitary Inspector on 31 October 2013. Patients in the geriatric age are a large group of patients included in the guidelines for recommended vaccinations.

Purpose. Discussion of immunization guidelines recommended in patients geriatric with a brief pathogens data of sickness.

Materials and methods. Based on the Immunization Program in 2014, the scientific literature and scientific articles discusses vaccinations recommended for patients in geriatric age (against hepatitis A and B, varicella, influenza, diphtheria, tetanus, whooping cough, *infection, Neisseria meningitidis* and *Haemophilus influenzae type B*, tick-borne encephalitis, cholera, typhoid, rabies and yellow fever).

Conclusions. Giving the recommended vaccinations at the age of geriatric patients are much less prone to infection, the disease runs in them in a milder form than in those not vaccinated, and less likely to occur in more severe complications.

Streszczenie

Wstęp. Profilaktyka zdrowia społeczeństwa jest ważną gałęzią działania Ministerstwa Zdrowia. Co roku Ministerstwo Zdrowia w Komunikacie Głównego Inspektora Sanitarnego przedstawia Program Szczepień Ochronnych (PSO) składający się z trzech części– kalendarza szczepień, szczepień zalecanych i informacji uzupełniających. PSO na rok 2014 został przedstawiony w Komunikacie Głównego Inspektora Sanitarnego w dniu 31 października 2013 roku. Pacjenci w wieku geriatrycznym stanowią dużą grupę pacjentów ujętych w wytycznych do szczepień zalecanych.

Cel. Omówienie wytycznych szczepień zalecanych u pacjentów w wieku geriatrycznym wraz z krótką charakterystyką patogenów wywołujących dane jednostki chorobowe.
Materiały i metody. Opierając się o Program Szczepień Ochronnych na rok 2014, literaturą naukową i artykułami naukowymi omówiono szczepienia zalecane u pacjentów w wieku geriatrycznym (przeciwko wirusowemu zapaleniu wątroby typu A i B, ospie wietrznej, grypie, błonicy, tężcowi, krztuścowi, zakażeniu *Neisseria meningitidis* i *Haemophilus influenzae typ B*, kleszczowemu zapaleniu mózgu, cholerze, durowi brzusznemu, wściekliźnie oraz żółtej gorączce).
Wnioski. Poddając się szczepieniom zalecanym pacjenci w wieku geriatrycznym są w znacznie mniejszym stopniu narażeni na zakażenie, choroba przebiega u nich w łagodniejszej postaci niż u osób nie zaszczepionym oraz rzadziej występują u nich ciężkie powikłania.

Introduction

Vaccination history dates back to the second half of the eighteenth century, when the English physician Edward Jenner, May 14, 1796, as the first boy made inoculate James Phipps against smallpox vaccine. Another breakthrough in the field of bacteriology and virology attributed to the French chemist Louis Pasteur. He created and gave nine years old Joseph Meister bitten by a rabid dog vaccine that saved the life of a child. The end of the nineteenth and beginning of the twentieth century is the emergence of new vaccines, learning about them and the start of mass vaccination saving millions of lives [1, 2, 3]. This vaccine formulation introduction into an organism which is of biological origin antigen stimulates the immune system [4, 5]. The mechanism of action of vaccination is based on the identification of the antigen introduced into the body as a foreign molecule. Foreign antigen is destroyed by the immune system to form the neighing of immunological memory. The most common route of administration of the vaccine is injection by skin, other methods include inhalation, oral or discontinued in the 80sNineteenth century road scarification, or scratch the skin. Road scarification was used during vaccination against smallpox [4, 6, 7]. The following table (Table 1) shows the division and a short description of the major types of vaccines with the latest generation.

Table 1. Division and short description of the most important types of vaccines with the latest generation.

Type of vaccine	Characteristic of the studied
The vaccine specific	Directed against a specific disease entity (eg, rabies).
Non-specific vaccine	Directed against infectious agents (e.g., formulation Wetastymina).
Combination vaccines	Directed against a number of specific disease entities (eg Di-Per-Te, which is a vaccine against diphtheria, pertussis and tetanus).
Monovalent vaccine	Directed against one disease entity. They contain antigens from one type of microorganism (e.g., tetanus vaccine).
Polyvalent vaccines	Directed against one disease entity. May contain several serotypes of the organism of one species (eg, a vaccine against human choroid Plexus Papilloma) or more serotypes of one species of micro-organisms (eg, vaccination against influenza vaccine).
Vaccines new generation	Obtained by deletion, are genetically modified live attenuated pathogens. -Subunit of the pathogen antigen on the larger carrier. With pure DNA built into the cells of the graft.

Contraindications to vaccination used in the expanded immunization program EPI (Expanded Program of Immunization) - according to the findings of the WHO European groups are few and include, among others, are here severe disease. The occurrence of acute illnesses that run

a fever or systemic disorders with significant clinical disorders are a contraindication to vaccination until resolution of the disease. It should be emphasized that the temperature to 38.5 °C, upper respiratory tract are not a contraindication for grafting. The second is a contraindication for vaccination immune disorders live vaccines, which should not be used in patients with diseases with immunological deficiency (hypogammaglobulinemia or agammaglobulinemia), people in the immunosuppression resulting from the ongoing active malignancies. Live vaccines are also contraindicated in pregnant women. The last group of patients, who should carefully be vaccinated are people who are allergic to components of the vaccine. Sensitization is an absolute contraindication to undergo vaccination. Particularly at risk are people reacting in an interview allergic to the protein as widely propagated influenza vaccination are based on the tissues of chicken eggs [5, 9, 10]. In Poland, for the first time in 1959, introduced the vaccination of children against tuberculosis, poliomyelitis which are publicly funded. A year later, accompanied by vaccination against diphtheria, pertussis and tetanus (Diphteria-Pertussis-Tetanus, or Di-Per-Te). With the introduction of vaccination of children it had eradicated completely smallpox (70 years of the twentieth century) and significantly reduced the number of infectious diseases and, consequently, reduced mortality for this reason [11]. In Poland, since 2007, a new program of immunization (PSO), which defines the scope of mandatory and supplementary vaccination [7, 12]. Ministry of Health Communication Chief Sanitary Inspector PSO annually presents the following calendar year. Vaccination program consists of three parts: the first contains information about mandatory vaccinations - the schedule of vaccination. Calendar vaccination is divided into two groups: compulsory vaccination of children and adolescents in according age and compulsory vaccination of exposed persons as identified b special to infection. The second part is the recommended vaccinations, not financed from funds in the budget of the Ministry of Health. Part of a third body contains supplemental information. Financing vaccination laid down in the first and second annex is based on the provisions of the Act of 27 August 2004 on health care services financed from public funds (Journal U. 2008 No. 164, item 1027, as amended). The current Immunization Program for the year 2014 was presented in the Communication from the Chief Sanitary Inspector on 31 October 2013 in Warsaw as an attachment to art. Paragraph 17. 11 of the Act of 5 December 2008 on preventing and combating infections and infectious diseases in humans (Journal U. 2013. item 947) [12].

Political changes in patients geriatric

Patients in the geriatric age represent a large group of people included in the indications to undergo vaccinations recommended [12]. The life cycle of the body consists of two phases. The first is the development in time, in which there is an increase in the biological function and adaptability of the organism. Process aging of the organism in which the biological functions are reduced and the ability to adapt to the body (immune system and the nervous system) is the second phase [7, 13]. Aging of the immune system is based on the gradual impairment growing during its ability to recognize and destroy foreign antigens. The consequence of processes occurring with age within the immune system is the increased incidence of infections, cancer, increased incidence of autoantibodies and widely understood decreased immunity (increased incidence of infections, chronic fatigue syndrome, reduced activities of daily living). In patients of geriatric infections run longer, they are very heavy and serious forms of health complications. Geriatric patients (over 65 years old) is more than 60% of all cancers occurring in the general population. This involves Trim weakening the immune system and increased susceptibility to infection [13]. Vaccination geriatric age protects patients from severe forms of severe infections and complications. The Ministry of Health in PSO recommends for patients following vaccination against hepatitis A and B,

varicella, influenza, diphtheria, tetanus, whooping cough, *infection, Neisseria meningitidis* and *Haemophilus influenzae* type B, tick-borne encephalitis, cholera, typhoid, rabies and yellow fever [12].

Vaccination against hepatitis A

Hepatitis A commonly known as oral hepatitis is caused by viruses belonging to the picornavirus family, which is a single-stranded genetic material is RNA. Gates of infection is the human digestive tract (through the patient's secretions or contact with infected food) [9]. Initially, the virus is propagated in the gastrointestinal tract, followed by viraemia. The clinical manifestation of infection is to take the liver. Uncharacteristic symptoms are initially, sick often combine them with a simple cold or infection, here include general weakness, fever or elevated body temperature, loss of appetite, appear at the end of localized pain in the upper abdomen quadrants [9, 14, 15]. Prophylaxis against infection is hygiene - washing hands, not taking water from an unknown source, and unwashed, raw fruits and vegetables. The greatest risk of infection occurs in people traveling to endemic areas, in areas with a large population of people who can potentially be a reservoir of the virus - especially here include hospital, workplaces, schools, nursing homes, hospices [9, 16-19]. The possibility of viral infection hepatitis A is very high especially for those traveling on the continents: African, South America, Indochinese. Identification of the virus is carried out using ELISA [5, 9, 17, 18]. Vaccination is recommended for people who travel to countries with high endemicity and indirect incidence of viral hepatitis type A, as well as persons engaged in the production and distribution of food, disposal of municipal solid waste and liquid impurities and the maintenance of equipment used for this purpose. The vaccine is administered intramuscularly. [7, 12].

Vaccination against hepatitis B

HBV is a virus belonging to the family hepaciviruses causing acute and chronic hepatitis, cirrhosis and primary hepatocellular carcinoma. In the course of HBV infection also occurs extrahepatic diseases, among others. to glomerulonephritis, polyarteritis nodosa, and cryoglobulinemia. It is related to the operation of immune complexes containing specific antigens and antibodies and complement fraction virus [7, 9, 20]. Causes of infection HBV infection are different for certain age groups. The most common ways in young people are sexual contact, often with multiple partners and injecting drugs NYM contaminated equipment. In the elderly, the infection most often occurs in a hospital due to inadequate sterilization of medical instruments, not washing hands and not changing gloves by health care workers. Very rare cause infection HBV is a blood transfusion or blood products [9, 21]. Symptoms of acute viral hepatitis B are dependent on co-morbidities, among others. cholelithiasis, diabetes or alcoholism. Mileage also depends chronic HCV and immunosuppressive therapy. The most common symptoms of acute hepatitis B include jaundice and influenza like illness. Some patients experience symptoms from the gastrointestinal tract. Almost always observed relationship ex-wife ALT and AST activity [9, 22]. Recovery ends at approximately 90-95% of cases of acute hepatitis B, au approximately 5-10% of patients comes to the survival of infection (HBV DNA detectable in serum and liver). In 1 - 2% of patients developed hyperacute hepatitis. Where antygenemia HBs and increased serum transaminase levels persist for at least 6 months, should recognize chronic hepatitis B [9, 23]. Despite the fact that in our country there is a dramatic decrease in the incidence of acute hepatitis B, which is undoubtedly related to the more widespread use of vaccinations, persons chronically infected with HBV are still a major epidemiological

problem. Chronic hepatitis B is characterized by a three-phase course. The period of immune tolerance lasts from a few to several years. The level of HBV DNA is then very high, HBe-Ag positive, the activity of ALT and AST is slightly increased. In the histopathological states mild inflammation. In the period of immune tolerance does not undertake to therapy. This is followed by a period of immune elimination of infected hepatocytes. HBV DNA level is reduced, the activity of transaminases increased. In the histopathological states the inflammation process. The second phase is the most effective therapy of IFN-alpha preparations. The third phase is called the phase of latent infection. In hepatocytes HBV DNA is detected while the HBs-Ag in the serum is negative. HBV infection probably persists throughout life and never comes to the eradication of the virus [5, 9, 18, 20, 24]. Vaccination is recommended to those who due to lifestyle or occupation carried out are at risk of infection associated with damage of tissues or through sexual contact. Another group of people who are particularly recommended to make vaccination a chronically ill people at high risk of infection: not vaccinated as part of mandatory vaccination, ill with immunodeficiency, including immunosuppressive therapy, patients with diabetes and patients on dialysis. In addition, patients being prepared for surgery and adults, especially in the elderly. Route of administration is intramuscular vaccination [7, 12]. In PSO 2014 identifies specific guidelines for dosage and course of vaccination. It is recommended that vaccination basic cycle 0; 1; 6 months. There should be vaccinated individuals previously vaccinated with a basic, although the concentration of anti HBs below the protective level (10 IU / l). Booster doses in patients with impaired immunity should be administered according to the doctor's orders and the manufacturer. Revaccination after vaccination basic concerns: patients with immunodeficiency, when the primary vaccination HBs antibody concentration is <10 IU / l, it is recommended that the administration of subsequent doses of vaccine 1-3. When the concentration of antibodies is still <10 IU / l, no further vaccination is performed. Cancer patients with immunosuppressive therapy and transplant patients, it is recommended Rome antibody level> / 100 IU / l. The control antibody is recommended every six months, when the concentration falls below <100 IU / l must be given a double dose of the vaccine. Patients with diabetes mellitus, when the basic adult vaccination antibody concentration is <10 IU / l, instructs the revaccination 1-3 doses of vaccine, when not obtain a protective levels of antibodies after 1-3 doses of vaccine, departs from further vaccination [7, 12].

Varicella vaccine

Chickenpox is an infectious disease caused by VZV *(Varicella zoster virus)* belongs to the group of herpes viruses. Reservoir of infection is the man. Usually the infection occurs iej late winter and early spring [9]. It is one of the most common diseases among the population. Period of lodging is estimated to be about two weeks from the moment of contact with a person who is ill. It is particularly important to remember that VZV infection occurs already around one-two days before the onset of rash in a patient and continues until the give way tings active lesions [7, 9, 20]. The virus enters the body through droplet. During the phase of the contagious patient during direct contact with the skin (active lesions) or by indirect contact with the material derived from recently released bubbles. After exposure to VZV and in the body, the virus multiplies in the nasopharynx, it takes about 4-6 days of taking different inside surrounding lymph nodes. Next spread through blood vessels to the spleen, liver and nervous systems [9, 25, 26]. During this time the sick person complains of malaise, headache, fever row 37-40 °C, persistent itching accompanying eruption. Stay is particularly dangerous for the elderly [9, 27]. Eruptions on the skin of the patient can simultaneously exist in different stages - from spots by lump vesicle (solid content liquid) in a pustule and scab. The majority of cutaneous lesions in occurs without scarring [9]. VZV infection in most cases

goes without complications. Sometimes you may experience dangerous complications of diseases of nervous system (cerebellar ataxia, seizures, fever, inflammation of meningitis, encephalitis), gastroenteritis, pneumonia, skin changes due to superinfection eruptions, in extreme cases, even death [7, 9, 20]. A person who has suffered from chickenpox have a form of the virus in latent form. The latent form of the virus is located in the spinal ganglia, and cranial nerves. In the event of a poor immune cell activation occurs and the virus of herpes zoster. VZV of turns passes into the skin via sensory nerves. The most common location of shingles is the skin of the chest and head (range innervation of the trigeminal nerve). Other forms of shingles is herpes zoster ophthalmic (coil Gasser - the area of innervation of the trigeminal nerve branches I), herpes zoster ear, Ramsay-Hunt syndrome, herpes zoster elbow (inflammation of the facial nerve), herpes zoster disseminated cutaneous or visceral (special group of patients after bone marrow transplantation) .Complications of shingles overlap with the complications of chickenpox. Approximately 20% of patients, mostly elderly people remain persistent nerve pain in the areas of change healed, sometimes accompanied by sensory disturbances. Pain that lasts more than 30 days from the beginning of shingles or one that appeared after a period of four weeks after postherpetic painless neuralgia call. Approximately 5% of patients, pain may persist for up to six months, but sometimes persist for years [9, 26, 27]. In patients with ophthalmic zoster may occur as a complication of visual impairment (scarring of the cornea, glaucoma, cataracts, chronic and recurrent uveitis, optic-nerve paralysis of the oculomotor, trochlear and abducens) and in extreme cases, blindness. Complication of herpes zoster may be a follow-ear noise, hearing loss [5, 9, 26, 28]. Vaccination is recommended to those who did not had chickenpox and have not been vaccinated within the framework of mandatory or recommended vaccinations. Route of administration is intramuscular vaccination or subcutaneous. [7, 12].

Vaccination against diphtheria, tetanus and pertussis

The following table (Table 2) shows the infection caused by *Corynebacterium diphetriae*, *Clostridium tetani* and *Bordetella pertussis* and their brief characteristics, symptoms and treatment of infections.

Table 2. Om catching a disease entities caused by *Corynebacterium diphetriae*, *Clostridium tetani* and *Bordetella pertussis* along with prevention in the form of vaccinations.

Feature	Corynebacterium diphtheriae	Clostridium tetani	Bordetella pertussis
Called illness	Diphtheria	Tetanus	Pertussis
Features bacteria	Gram-positive, rod fixed	Gram-positive anaerobic rod	Gram-negative aerobic rod
Symptoms	Changes in local skin, navel, conjunctiva and the nasal mucous membranes, inflammation of lymph nodes, respiratory tract infection. In the case of infection with the exotoxin-producing strains: myocarditis, conduction disorder and heart block and reversible segmental demyelination of nerve fibers that is causing paralysis.	Lockjaw, tense facial muscles of the face, neck muscles, spine, chest, abdomen and lower limbs. Spasms leading to immobilize the chest and serious disturbances in lung ventilation and vertebral compression fractures. The symptoms of asphyxia. In severe cases, symptoms of cardiovascular.	Catarrhal phase of sneezing, runny nose, tearing, fever, cough. Phase paroxysmal coughing fits, choking cough ending with a loud whistling breath laryngeal and expectoration thick, sticky mucus. Phase recovery: a gradual decrease in seizure frequency and milder their course.

Vaccination against diphtheria, tetanus and pertussis (Di-Per-Te) is recommended for the elderly, which due to the executed busy and are prone to infection. It is also recommended to persons employed on the wards and pediatric neonatology handheld. After of 19 years of age (basically graft) boosters are recommended every 10 years. Vaccination against diphtheria, tetanus and pertussis vaccines are reduced content of component pertussis (DTaP or DTaP / IPV) - it is recommended for all adults instead of a booster dose every 10 years. [7, 12].

Vaccination against influenza

Influenza is an infectious disease caused by influenza virus belongs to the genus orthomyxoviruses, which can cause serious health complications. It is one of the most widespread diseases that produce serious complications. Infection occurs during seasonal epidemics through droplet. There three influenza virus types A, B and C [9]. The mechanism is based on infection of the virus from entering the respiratory tract where a specific protein hemagglutinin from the group of antibodies on the surface of the virus is associated with airway epithelial cells, provoking endocytosis. Absorbed virus begins to replicate. Replicated molecules (about 6 hours s) are released and attack another cell [9, 36, 37]. This process is very fast in a short time the virus takes up most of the respiratory tract, causing the occurrence of sudden symptoms such as high fever (up to 40 $^{0^{\circ}}$C), headache and throat, dry cough, general weakness, muscle pain, lack of appetite [7, 9, 20]. The potential risk group for influenza virus infection are all ages. The symptoms persist for two weeks, after this period most of the people return to full recovery, but there are severe health complications. The disease and its complications are particularly dangerous for the elderly [9, 38, 39]. High, increasing fever accompanied by vomiting promotes dehydration and disorders of water and mineral admission to long-term persistence of this condition can in extreme cases cause death [9, 34]. The most common and most dangerous complications include exacerbation of chronic inflammatory diseases of the respiratory failure, myocardial infarction and death [5, 9]. Vaccination against influenza were in PSO as vaccination recommended. Clinical indications for vaccination and individuals include people with chronic illnesses, especially suffering from respiratory failure, asthma, chronic obstructive pulmonary disease, cardiovascular failure, coronary heart disease (especially myocardial infarction), renal insufficiency, recurrent nephrotic syndrome, liver disease, metabolic diseases (including diabetes), neurological and neuro. People in immunocompromised states (including patients after transplantation of organs or tissues). Vaccination is recommended for epidemiological indications in patients aged over 55 years of age, persons having close contact professional or a family with children aged less than 6 months of age and the elderly or patients survived (as part of the strategy of vaccination cocoons), security personnel health (medical personnel, regardless of having the expertise and administrative staff), schools, trade, transport. Epidemiological indications also include residents of nursing homes, social care homes and day care centers to ensure people with disabilities, the chronically ill or elderly persons, particularly residing in care facilities - medical, nursing facilities - care, entities providing services in the field of palliative care, hospice and palliative care, hospice, long-term rehabilitation, drug treatment, mental health care and spa treatment. Dosage and vaccination series by the vaccine manufacturer. Vaccines are only valid one year due to the annual changes in the composition according to the recommendations of the World Health Organization [7, 12].

Vaccination against invasive *Neisseria meningitidis and Haemophilus influenzae* type b

The following table (Table 3) shows invasive infections caused by *Neisseria meningitidis* and its short characteristics, type and route of spread of infection.

Table 3. Invasive infection with *Neisseria meningitidis* and *Haemophilus influenzae* type B - a discussion of disease entities with prevention in the form of vaccinations.

Feature	*Neisseria Meningitidis*	*Haemophilus influenzae* type B
Called illness	Inflammation of the meninges	• infection of the upper and lower respiratory tract • invasive infections such as meningitis
Features bacteria	Diplococcus Gram (-)	The baton, Gram (-)
Reservoir, roads infection	Only man, the way droplets, direct contact of the host, not the sick person. The peak incidence is autumn and winter.	Only one road droplet.
Colonization, the incubation period	Colonization-cavity naso-pharyngeal. The incubation period of 2-10 days.	Average time of colonization six weeks.
Symptoms of infection	Initially-general weakness, fever, malaise, myalgia. With the occupation of MR-tire headache, stiff neck, seizures. The subsequent step-rash petechial, confluent in patches, niebledną ca under pressure.	Inflammation of the tire meningitis, epiglottitis, otitis media, pneumonia, respiratory tract.
Complications	Neurological, deafness, in extreme cases, even death.	Neurological, deafness, sepsis, airway obstruction, skin, heart, pericardium, joints and marrow.
Risk groups, vaccination	Unconjugated vaccine (polysaccharide) against serogroups A and C is recommended for adults. Route of administration is intramuscular vaccination or subcutaneous.	Vaccination is recommended for people with impaired immunity as indicated by the individual. Route of administration is intramuscular vaccination or subcutaneous. Dosage and vaccination series by the vaccine manufacturer.

Vaccination against tick-borne meningitis

Tick-borne meningitis is a disease of the central nervous system. Induced by ticks of the family *Flaviviridae,* which in time with the warming of the climate over the past centuries endemic began to migrate to the mountain areas. Easy movement of people enabled the expansion of the forest environment to be useful ohm parks or gardens [5, 6]. In Poland, the most vulnerable are the Warmia-Mazury and Podlaskie. There are two peaks of incidence of tick-borne encephalitis attributable to the end of June and July, and October. Infection transmission by ticks occurs during the bite, bites are the most common places around the head and limb flexor. Mileage may be asymptomatic or full-blown two-phase. The first phase is a flu-like symptoms which appear in approximately 7 days after exposure to tick for that persist about 5 days followed by a phase of false improve the patient's condition. Oil painting stage of infection is the expansion of the central nervous system, which gives life-threatening respiratory disorders, and cardiovascular disease, which is often accompanied by headache [5, 7, 9]. Symptoms of infection should disappear for a month, leaving most of the health complications, however, in some patients, especially when they occur in the brain or spinal symptoms may appear permanent nerve paralysis, paresis of the body, migraine, cognitive decline, depression. Diagnostic tests based on blood and cerebrospinal fluid. There is only symptomatic treatment. The only possible way of preventing the possibility of averting giving

ourselves against this potentially protection disease is vaccination [5, 7, 9, 46, 47, 48]. Ministry of Health issued 31 October 2013 Communication on Immunisation Programme in 2013 upheld the vaccination against tick-borne encephalitis in the recommended vaccinations. Vaccination is recommended for persons who are in areas with severe occurrence of disease, particularly those engaged in the exploitation of the forest, stationed army officers and firefighters border, farmers, people lounging in a forest. [7, 12].

Vaccination against cholera, typhoid, yellow fever, rabies

Discussion with the prevention of cholera, typhoid, yellow fever, and rabies is presented in the following table (Table 4)

Table 4. Cholera, typhoid, yellow fever, rabies-a discussion of disease entities with prevention in the form of vaccinations.

Disease	Cholera	Typhoid	Yellow fever	Rabies
Pathogen	Przecinkowiec *Vibriocholerae*	The baton *Salmonella typhi*	viruses of the family *Flaviviridae*	viruses of the family *Rhabdoviridae*
Reservoir, roads infection	Digestive tract infection-consumption of contaminated water, food. Rarely through direct contact with a sick person or carrier.	Digestive tract infection-consumption of contaminated water, food. Rarely through direct contact with a sick person or carrier.	Vector-infected mosquito of the genus *Aedes, Haemagogus* or *Sabethes.*	Vector-infected animal or human. Infection occurs through contact with infected body fluids (saliva, cerebrospinal fluid).
The incubation period	For several hours to 5 days.	10-14 days. Extreme cases of 7-28 days.	6 days.	4-12 weeks.
Symptoms of infection	Violent, watery diarrhea leading to dehydration (dry mucous membranes, pallor, hypotension, muscle cramps, heart disorders and kidney disease, impaired consciousness).	Increasing fever, weakness, headache, abdominal pain accompanied by diarrhea or constipation, skin rash.	Fever accompanied by chills weakness, nausea and headache. You may receive a yellowing of the skin layers.	Sensory disturbance around the site of infection, anxiety, salivation, dilated pupils, sweating.
Complications	Hypovolemic shock, untreated for several hours can lead to death.	Perforation of the intestinal wall, peritonitis, sepsis, inflammation of the brain, death.	Liver and kidney damage, bleeding in the gastrointestinal tract, in extreme cases, death.	Dysphagia (painful muscle spasms), difficulty in breathing, convulsions, death occurs after a period of about a week after the onset of symptoms.
The disease incidence	Developing countries in Africa, Asia, Central and South America, areas with low standards of sanitation.	South Asian countries (India, Nepal and neighboring countries), and all of Africa.	The greatest risk of infection exists in countries in Africa, Latin America and Central South. The greatest risk exists for tourists traveling to Africa.	The disease occurs worldwide. Most cases of WHO notes in Asia (India, Vietnam, Thailand) and Africa.
	People traveling to areas of the disease.	People traveling to areas of the disease.	People leaving the area recognized by the World Organisation for Health at risk for infection,	Persons going to endemic areas cases.

			according to the International Health Regulations.	
Risk groups, vaccination	Administered by oral vaccination. The dosage recommended by the manufacturer of the vaccine.	Vaccination administered by subcutaneous or intramuscular routes. The dosage recommended by the manufacturer of the vaccine.	Vaccination administered by subcutaneous or intramuscular routes. The dosage recommended by the manufacturer of the vaccine.	Vaccination administered by the intramuscular or subcutaneous route. The dosage recommended by the manufacturer of the vaccine.

Conclusions

Poland as a country against the average wealthy European countries, despite the increasing amounts of money on disease prevention is not able to provide free access to all vaccinations. Ministry of Health issued the Regulation for the current calendar year proposes pay vaccinations recommended (optional). Growing awareness of physicians and patients about the serious health complications resulting from year to year more and more people vaccinated within the recommended vaccinations.

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