“IMMUNOPROPHYLAXIC OF INFECTIOUS DISEASES ”

Plan of lecture

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Vaccination against a HIb-infection

Vaccination against a HIb-infection

- In 1798 Jenner began the development of vaccinal prevention. He has named the method of an inoculation vaccination, and a material taken from the cow pockmark - a vaccine.

In 1880 Lui Pasteur creates the doctrine about the protective inoculations. He establishes an possibility of artificial weakening of virulence pathogenic microbes.

The characteristic of vaccine preparations

The following types of vaccines are known:

- alive (attenuated),
- killed (inactivated),
- chemical,
- recombinant,
- anatoxin (toxoids),
- monovaccines,
- associated vaccines,
- polyvalent,
- adsorbed.

Alive or attenuated vaccines

- **Attenuated are the vaccines weakened in virulence. Among them are vaccines against a tuberculosis, measels, rubella, mumps, poliomyelitis vaccine Sabin, brucellosis, yellow fever, tularemia, plague, typhoid. The main value of alive vaccines is their high immunogenicity. Simple introduction is enough to form immunity for some years.**

- ***For example, after introduction of a vaccine against tularemia, a yellow fever, immunity is kept not less than 10 years.***

Killed or inactivated vaccines:

- **They are used against whooping-cough, poliomyelitis Solk, cholera, tick-borne encephalitis, Japanese encephalitis, leptospirosis, rabies. The advantage of killed vaccines is simplicity of their manufacturing and the big stability at storage. Imperfection of inactivated vaccines is a weak immunogenicity and necessity of repeated introductions.**
- ***For example, a cholera vaccine is introdused twice, against whooping-cough it is three times etc. After the introduction of inactivated vaccines it is formed short immunity.***
- ***For example, after vaccination against a cholera immunity is kept till 6 months or 1 year.***

The chemical vaccines.

- **The chemical vaccines are the antigenes taken from microbic cultures.**

- ***For example, the vaccines against meningococcal infection type A and C vaccine (immunity for 4 years), abdominal typhoid (from Vi-antigen), cholera bivalent chemical vaccine, containing serotypes Inaba and Ogava.***

The anatoxines (toxoids)

- **The anatoxines (toxoids) contain inactivated toxin which is produced by a microbe.**

- ***For example, diphtheritic, tetanic anatoxins. After the introduction of toxoids the antitoxic immunity is formed.***

The recombinant vaccines

- **The recombinant vaccines are the new type of vaccines. They are created with the use of molecular biology and biotechnology.**

- ***The vaccines against a viral hepatitis B and a influenza are related to recombinant.***

- **The monovaccines** are intended for immunization against one infectious disease (for example, against tularemia);
- **The bivaccines** are intended for immunization against two illnesses (for example, against an abdominal typhoid and paratyphoid B);
- **The associated vaccines** are intended for immunization against several illnesses (for example, against whooping-cough, diphtheria, tetanus, which structure includes an antigens of whooping-cough microbe, tetanic and diphtheritic toxoids;

The polyvalent vaccines

- **The polyvalent vaccines - preparations are intended for immunization against one infection, but includes some serologic types (for example, polyvalent vaccines against a poliomyelitis, a influenza, leptospirosis);**

The adsorbed vaccines

- **The adsorbed vaccines are the vaccines adsorbeded on mineral colloids (as a rule on gel hydroxide aluminium), with the purpose of immunogenisity increase. The use of adsorbed vaccines increases the period of influence of antigenes on an vaccinated organism.**
- ***For example, the vaccine against whooping-cough, diphtheria, tetanus. Antigens of whooping-cough microbe, tetanic and diphtheritic toxoids are related to absorbed on gel hydroxide aluminium.***

- The structure of vaccines includes except antigens the stabilizers and antibiotics which are necessary or for prevention of bacterial growth, or for stabilization of immunazing antigene.

- As the stabilizer can be used formaldehyde or phenol (for example, inactivated vaccine against poliomyelitis, influenza, against Japanese encephalitis). As the stabilizer is more often used.

- Some vaccines contain traces of antibiotics (as a rule aminoglycosides): canamycin, neomycin (for example, vaccines against measles, rubella, mumps, poliomyelitis, rabies, a vaccine against tick-borne encephalitis).
- It is necessary to know, that in persons sensitive to one of these components allergic reactions are possible. Some vaccines contain egg fiber. For example, egg fiber contains in a vaccine against measles, rubella, mumps, typhoid, yellow and Q-fevers. In people with the increased sensitivity to these components (to preservatives, stabilizers, antibiotics, egg fiber), heavy allergic complications after introduction of such vaccines can develop.

The ways of introduction of vaccines

- The ways of introduction of vaccines can be as follows: intronasal, peroral, epicutaneously, intracutaneously, hypodermically and intramuscularly. For example, the inactivated influenza vaccine is introduced intranazal; alive poliomyelitis vaccine Sabin and cholera bivalent chemical in the form of tablets are given peroraly. The alive vaccines against a plague, tularemia, Siberian ulcer, brucellosis and Q-fever are introduced epicutaneously. The antitubercular vaccine can be given only intracutaneously.

The ways of introduction of vaccines

- Vaccines are hypodermically introduced against measles, rubella, mumps, whooping-cough, diphtheria, tetanus, yellow fever. The vaccine against a viral hepatitis B is introduced intramuscularly. Some vaccines can be introdused both hypodermically, and intramuscularly - for example, the vaccine against whooping-cough, diphtheria, tetanus.

The conditions of carrying out of inoculations

- The introduction of a vaccine is accompanied by immunologic changes in an organism of the person. Besides the formation of antibodies, the development of postvaccinated reactions and complications is possible. The postvaccination reactions are short-term also do not cause serious changes. The postvaccination complications can be caused by the vaccine itself, connection of intercurrent infections and an acute of chronic diseases. Therefore vaccination is carried out only to healthy children and adults.

The conditions of carrying out of inoculations

- 1. It is impossible to inoculate the child who had contact with infectious patients. It is necessary to postpone the inoculation for the term equal to the maximal incubation period. For example, the child contacted with a patient with mumps on the 1 February. It is possible to inoculate him not earlier than 23 February (if the child will not ill for this period).

The conditions of carrying out of inoculations

- 2. The scheduled inoculations are cancelled during epidemic of any infection, for example, during epidemic of an influenza.

The conditions of carrying out of inoculations

- 3. Children who are frequently were ill with sharp respiratory virus infections, it is better to inoculate them in a warm season and to recommend such children the isolation at home for 3-5 days. It is necessary to carry out vaccination not earlier than in 2-4 weeks after recovery.
- 4. If a child receives course of treatment by glucocorticoids or cytostatics vaccination can be carried out not earlier than in 6 months after a cancellation of treatment.

The conditions of carrying out of inoculations

- 5. The introduction of alive vaccines is contra-indicated for people with primary immunodeficiencies of a cellular link of the immunity, the combined immunodeficiencies.
- 6. It is recommended to do the scheduled vaccination in 6 months for the convalescents from a viral hepatitis A. It is recommended to do the scheduled vaccination in 12 months for the convalescents from a viral hepatitis B and C.

The conditions of carrying out of inoculations

- 7. The immunization of children with allergic aggravated anamnesis is carried out on a background of observance of hypoallergic diets. To the persons having anaphylactic reactions to egg fiber or antibiotics, introduction of vaccines against measles, rubella, mumps is contra-indicated.

- **Before the vaccination of children with allergic reaction to previous vaccination, it is necessary determine a degree of a sensitization to introdused antigenes. The most accessible is the reaction immunoleucolyses (reaction of inhibition of leukocytes migration). With the help of reactions it is possible to estimate possible damaging action of immunopreparation. The index of lysis of leukocytes 0-0,1 - the sensitization to given vaccinal strain is absent, it is possible to introduce a vaccine.**

- **The index of lysis of leukocytes 0,11-0,19 - there is a weak degree of a sensitization (it is possible to vaccinate on a background of desensitizing therapy. 3 days prior to an inoculation and 7 days after it appoint the antihistaminic preparations are prescribed). The index of lysis of leukocytes 0,2-0,29 there is a moderate degree of a sensitization. It is necessary carry out a course of desensitizity therapy. At the begining then carry out the repeated laboratory examination and it is possible to inoculate only under condition of normalization of index of a sensitization at 0-0,19.**

- **The index of lysis of leukocytes - 0,3 and more - there is a high degree of a sensitization to the data vaccinal strains. The inoculations are contra-indicated within 6 months and it is possible only after desensitizing therapy and repeated laboratory examination under the condition of normalization of index of a sensitization.**

- For example, you receive the following results – the index of lysis of leukocytes to components the vaccine against whooping-cough, diphtheria, tetanus: an index of a sensitization of an organism to whooping-cough antigene 0,35, to diphtheritic - 0,1, tetanic - 0,05. In this case it is necessary for you to carry out revaccination only the vaccine against diphtheria, tetanus, to exclude a whooping-couph component in connection with a high sensitization to it the given child.

- 8. The inoculations are contra-indicated in case of anemia if the content of hemoglobin is 80 g/l and lower.
- 9. The introduction of alive vaccines is contra-indicated for pregnant women. The inactivated vaccines and toxoids can be introduced to pregnant women only at the big risk of infection.
- 10. The immunization of children with a neurologic pathology should be carried out after the consultation with the neuropathologist and additional researches. Vaccination is carried out during staple remission, on the background of sedative and anticonvulsive therapy.

- The inoculations against infectious diseases are carried out according to the schedule and according to epidemic indications.
- The list of scheduled inoculations and the terms of carrying out are determined Ministry of Health. The vaccination against tuberculosis, poliomyelitis, whooping-cough, diphtheria, tetanus, rubella, mumps, measles, viral hepatitis B, HIb-infections is carried out in Ukraine according to a schedule.

The epidemic indications for inoculation.

- If in a collective patients have been revealed, for example, the diphtheria, poliomyelitis and other infectious diseases and it is danger of infection of associates.
- The certain professional groups of the population are vaccinated. For example, immunisation against brucellosus and the Siberian ulcer of workers of cattle-breeding farms if disease among animals has appeared. The persons working with sick animals, should be preliminary vaccinated.

The epidemic indications for inoculation.

- Necessity of vaccination of people against tularemia, tick-borne encephalitis arises in territory of the natural centers.
- It is necessary to inoculate some professional groups of residents disease. For example, the immunization against a yellow fever is carried out to people leaving to the countries, having focus of this infection.

The vaccinal prevention of a tuberculosis.

- The antitubercular vaccine was created by French scientists Calmette and Guerin in 1921. In honour of authors the weakened microbes have been named bacteria Calmette and Guerin. BCG – is attenuated vaccine. The vaccination against a tuberculosis is carried out unitary intradermal on the 3-5 day of child's life. The immunity develops approximately in 2 months after vaccination. The specific postvaccinal reaction develops in 4-6 weeks after vaccination. On a place of introduction appears infiltrate up to 8 mm with a small nodule in the center. Further on a place of papule the crust or a peeling are formed. The redevelopment of infiltrate appears in 5-6 months after vaccination.

The vaccinal prevention of a tuberculosis.

- The children of 7 and 14 years old which are not infected with bacteria of a tuberculosis (with negative Mantu reaction) are subjected.
- The complications after BCG vaccination are registered rare (0,003-0,02 % of cases).
- At breaking of technics of vaccination or wrong selection of children for revaccination, complications may be as follows education of not healing ulcers in diameter more than 1 sm, cold abscesses, regional lymphadenitis.

Vaccination against a whooping-cough, diphtheria, tetanus.

- Against a whooping-cough, diphtheria and tetanus children are immunizated adsorbed whooping-cough vaccine (inactivated) diphtheria (anatoxin), tetanic (anatoxin). The vaccine is given hypodermically. The vaccination is carried out from 3 month of age three times with an interval of a month. Some children may have local and general reactions after vaccination within first 2 days after an inoculation. The local reaction is manifested by edema, hyperemia, infiltration to 2 sm. The general reaction is characterized by rise of the temperature in the range 1-2 days up to 37,5°C. All other kinds of reaction concern to pathological course of vaccination process.

Vaccination against a whooping-cough, diphtheria, tetanus.

- The first revaccination against whooping-cough, diphtheria and a tetanus is given in 18 months. The subsequent revaccinations are given only against a diphtheria and a tetanus (anatoxin) in the age of 6, 11, 14, 18 years. The subsequent revaccination are given each 10 years. The revaccination are given unitary.

Vaccination against a poliomyelitis

- There are vaccines against a poliomyelitis: inactivated vaccine Solk, alive vaccine Sabin. Polyvalent vaccines against a poliomyelitis contain three types of virus I, П, III. The inactivated the vaccine is given hypodermically or intramuscularly. The alive vaccine is issued as a liquid preparation and is given per os. The vaccination against a poliomyelitis is combined with vaccination against a whooping-cough, diphtheria and tetanus. Revaccination is given in 18 months, 3 years, 6 years, 14 years.

Vaccination against a poliomyelitis

- Live poliomyelitis vaccine is areactogena.
- There is a contraindication for given it for children with primary immunodeficiency (may be the development of associated vaccination poliomyelitis connected with reversion of vaccinal strain of a virus).
- Vaccination with oral poliomyelitis vaccine, as a rule, does not cause reactions after vaccination and complications. Children within 2-3 days may have more intestinal discharges without changing of the general condition.

Vaccination against a HIb-infection

- The vaccination against a HIb-infection is combined with introduction inactivated vaccine against a whooping-cough, diphtheria and tetanus. Vaccination is given from 3 month three times with an interval of 1 month. The revaccination is given in 18 months.

Vaccination against measles, mumps, rubella

- In the advanced countries vaccination against measles, mumps, rubella is given in the age of 12 months. A vaccine against measles, mumps, rubella are alive, contains traces of antibiotics and egg. The vaccine is given hypodermically. The revaccination against measles, mumps is given in the age of 6 years. In the age of 15 years revaccination is given against rubella to girls and revaccination against mumps to boys.

Vaccination against measles, mumps, rubella

- At 10-15 % of vaccinated children with 4 up to 14 day postvaccination reactions may development: rise of a body temperature, cough, conjunctivitis, rash. The reaction lasts for 2-3 days.
- Complications after vaccination are seldom. In children with the aggravated allergic anamnesis at the first hours or days after vaccination may have allergic reactions.

Vaccination against a viral hepatitis B

- For vaccination against viral hepatitis B is used recombinant vaccine. The vaccination is carried out is three times: in the first day of child's life, in 1 month and in 6 months. Newborn from mothers carriers HBsAg, vaccination is given 4 times: the first day of the child's life, in 1 month, in 6 months of child's life.