

## **Modern Methods of Combating Infectious Diseases**

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**Abstract:** The article discusses the signs of infectious diseases, ways their distribution, methods of prevention and rules of conduct. Infectious diseases are classified according to etiology, clinical course of the disease, localization of the process and source of infection. Particular attention is paid to the most common infections, ways of their spread –and methods of prevention.

**Keywords:** Healthcare, infectious diseases, signs of disease, respiratory tract infections, infectious focus.

According to the World Health Organization, more than 1 billion people worldwide suffer from infectious diseases every year. Large numbers of people can become infected within a short period of time. Thus, El Tor cholera, which began in 1960 in Indonesia, by 1971 had spread to all countries of the world. The fourth influenza pandemic (an epidemic covering a group of countries and continents) in two years (1968-1970) affected about 2 billion people on all continents and claimed about 1.5 million lives. No, no, yes, and there are patients with plague, cholera, and brucellosis. The incidence of acute dysentery, typhoid fever, diphtheria, viral hepatitis, salmonellosis, and influenza is still high. Their occurrence is especially dangerous in enterprises, educational institutions, and military groups, where one person can infect everyone [1-7].

This is why it is very important to know the signs of infectious diseases, ways their distribution, methods of prevention and rules of conduct.

Infectious diseases are a large group of diseases caused by the impact on the human body of various pathogenic or conditionally pathogenic biological agents (bacteria, fungi, viruses, prions, protozoa).

**Infectious diseases and infectious diseases** are practically the same thing, only the term infectious diseases is used in a general context, and infectious diseases in a more specific context - sore throat, diphtheria, etc.

Infectious diseases are classified according to etiology (type of pathogen), clinical course of the disease, localization of the process and source of infection.

Depending on the type of pathogen, infectious diseases are divided into the following main groups:

- viral infections (influenza, viral hepatitis, HIV AIDS, infectious mononucleosis, herpes, chicken pox, measles, psittacosis );
- bacterial infections (dysentery, salmonellosis, tuberculosis, cholera, plague);
- fungal infections (candidiasis, lichen);

- infections caused by protozoa (amoebiasis, giardiasis );
- prion infections (the causative agent is specific protein molecules - prions , the least studied branch to date);
- infections caused by parasites (infestations) are separated into a separate field - parasitology. The main parasites in humans are worms (helminthiasis) and ectoparasites (lice, ticks).

According to the source and place of accumulation (reservoir) of the pathogen, all infectious diseases are usually classified as follows:

- anthroponoses – the source of infection is only humans (HIV AIDS, viral hepatitis, dysentery);
- zoonoses – in this case, the source and natural reservoir of infection are animals (tularemia, plague, brucellosis);
- sapronoses - pathogens can be found in other environmental objects, such as water, soil, air (legionellosis, gas gangrene);

Clinical classification involves the course of infectious diseases and is divided into:

- by type (typical or atypical, uncharacteristic for this infection);
- by severity (mild, moderate and severe);
- by duration of the process (acute, subacute and chronic infectious diseases) [8-12].

Depending on the main location and the entrance gate (the entrance gate is an organ or system of organs of the human body through which infection occurs), all infectious diseases are divided into main groups:

- intestinal infections (dysentery, acute intestinal infections, cholera, salmonellosis);
- respiratory infections (diphtheria, influenza, tonsillitis, infectious mononucleosis);
- blood infections (malaria, typhus, relapsing fever, plague);
- infections of the external integument (gonorrhea, syphilis, cytomegalovirus infection, papillomatosis ).

Despite the fact that with the advent of antibiotics and active immunization, most infections were defeated or controlled, there remain many infectious diseases that cannot be treated (viral hepatitis C , AIDS, prion infections).

The most typical signs of an infectious disease are: chills , fever, increased temperature. This causes headache, pain in muscles and joints, malaise, general weakness, weakness, sometimes nausea, vomiting, sleep disturbances, and loss of appetite. With typhus and meningococcal infection, a rash appears. For influenza and other respiratory diseases - sneezing, coughing, sore throat. Sore throat and diphtheria cause sore throat when swallowing. With dysentery - diarrhea. Vomiting and diarrhea are signs of cholera and salmonellosis.

Let us briefly consider the most common infections, ways of their spread and methods of prevention [13-18].

Respiratory tract infections are the most numerous and common diseases. Every year, up to 15-20% of the total population suffers from them , and during epidemic outbreaks of influenza - up to 40%. Pathogens are localized in the upper respiratory tract and spread by airborne droplets. Microbes enter the air with saliva and mucus when the patient talks, sneezes, or coughs (the highest concentration is at a distance of 2-3 m from the patient). Large droplets containing pathogens settle rather quickly, dry out, forming microscopic nucleoli. With dust they rise into the air again and are transferred to other rooms. When they are inhaled, infection occurs. With high indoor air humidity, insufficient ventilation and other violations of sanitary and hygienic rules, pathogens persist in the external environment longer.

During natural disasters and major catastrophes, people usually gather, norms and rules of community life are violated, which leads to widespread incidence of influenza, diphtheria, sore throat, and meningitis.

Flu. His virus can infect a significant number of people within a short time. It is resistant to freezing, but quickly dies when heated, dried, under the influence of disinfectants, or ultraviolet irradiation. The incubation period lasts from 12 hours to 7 days. Characteristic signs of the disease are chills, fever, weakness, severe headache, cough, sore throat, runny nose, soreness behind the sternum, hoarse voice. In severe cases, complications are possible - pneumonia , inflammation of the brain and its membranes [19-24].

Diphtheria is characterized by an inflammatory process in the pharynx and toxic damage to the cardiovascular and nervous systems. The causative agent of the disease is diphtheria bacillus. The entry points for infection are most often the mucous membranes of the pharynx, larynx and nose. Transmitted by airborne droplets.

The incubation period is from 5 to 10 days. The most characteristic manifestation of the disease is the formation of films in the upper respiratory tract. Toxic damage to the patient's body by the poisons of diphtheria bacilli poses a danger to life. When they spread, breathing problems may occur.

Cholera, dysentery, typhoid fever, salmonellosis, infectious hepatitis - all these acute intestinal infections take second place after airborne infections . In this group of diseases, pathogenic microorganisms enter the body through ingested food or water.

The destruction of water supply and sewer networks, poor sanitary standards, carelessness and imprudence in the use of open water bodies lead to the occurrence of these epidemics.

Acute bacterial dysentery. The causative agents are dysentery bacteria that are excreted in the patient's stool. In the external environment they persist for 30-45 days. The incubation period is up to 7 days (usually 2-3 days). The disease is accompanied by fever, chills, fever, general weakness, and headache. It begins with cramping pain in the abdomen, with frequent loose stools, in severe cases - with an admixture of mucus and blood. Sometimes there is vomiting.

Typhoid fever. The source of infection is patients or bacteria carriers . The typhoid and paratyphoid bacillus is excreted in feces and urine. They can survive in soil and water for up to four months, in feces for up to 25 days, and on wet laundry for up to two weeks. The incubation period lasts from one to three weeks. The disease develops gradually: well-being worsens, sleep is disturbed, and the temperature rises. On the 7-8th day, a rash appears on the skin of the abdomen and chest. The disease lasts 2-3 weeks and can be complicated by intestinal bleeding or perforation of the intestine at the site of one of the many ulcers formed.

Infectious diseases arise under three main factors: the presence of a source of infection, favorable conditions for the spread of pathogens, and a person susceptible to the disease. If you exclude at least one link from this chain, the epidemic process stops. Therefore, the goal of preventive measures is to influence the source of infection in order to reduce contamination of the external environment, localize the spread of microbes, and also increase the population's resistance to diseases.

Since the main source of infection is a sick person or a bacteria carrier , early detection, immediate isolation and hospitalization are necessary. With a mild course of the disease, people, as a rule, go to the doctor late or do not do so at all. Door-to-door visits can help in identifying such patients as quickly as possible.

The premises where the patient is located must be regularly ventilated. Select a separate room for it or fence it off with a screen. Operating personnel must wear protective gauze masks [25-27].

Emergency and specific prevention is important for preventing the development of infectious diseases.

Emergency prevention is carried out when there is a danger of mass diseases, but when the type of pathogen has not yet been precisely determined. It consists of the population taking antibiotics, sulfonamides and other medications. Emergency preventive measures, when used in a timely manner according to predetermined schemes, can significantly prevent infectious diseases, and if they occur, alleviate their course.

Specific prevention - the creation of artificial immunity (non- susceptibility) through protective vaccinations (vaccinations) - is carried out against some diseases (smallpox, diphtheria, tuberculosis, polio, etc.) constantly, and against others - only when there is a danger of their occurrence and spread.

It is possible to increase the population's resistance to infectious agents through mass immunization with protective vaccines, the introduction of special serums or gamma globulins . Vaccines are pathogenic microbes that are killed or weakened by special methods, and when introduced into the body of healthy people, they develop a state of immunity to the disease. They are administered in different ways: subcutaneously, cutaneously, intradermally , intramuscularly, through the mouth (into the digestive tract), by inhalation.

To prevent and mitigate infectious diseases in the form of self- help and mutual assistance, it is recommended to use the products contained in the first aid kit of an individual AI-2.

If a source of infectious disease occurs, quarantine or observation is declared in order to prevent the spread of disease.

Quarantine is introduced when particularly dangerous diseases occur (smallpox, plague, cholera, etc.). It can cover the territory of a district, city, or group of settlements.

Quarantine is a system of regime, anti-epidemic and treatment and preventive measures aimed to completely isolate the outbreak and eliminate diseases in it.

The main security measures when establishing quarantine are: protecting the source of an infectious disease, populated areas in it, infectious disease isolation wards and hospitals, and checkpoints. Prohibition of entry and exit of people, entry and exit of animals, as well as removal of property. Prohibition of transit passage of transport, with the exception of rail and water. Separation of the population into small groups and limitation of communication between them. Organization of delivery to apartments (houses) of food, water and basic necessities. Stopping the work of all educational institutions, entertainment institutions, and markets. Termination of production activities of enterprises or their transfer to a special mode of operation.

Anti-epidemic and treatment and preventive measures under quarantine conditions include: the use of medications by the population, for the protection of food and water, disinfection, disinfestation, deratization, sanitization, strict adherence to personal hygiene rules, active identification and hospitalization of infectious patients.

Observation is introduced if the type of pathogen is not particularly dangerous. The purpose of observation is to prevent the spread of infectious diseases and eliminate them. For this purpose, essentially the same treatment and preventive measures are carried out as during quarantine, but during observation, isolation and restrictive measures are less strict.

The period of quarantine and observation is determined by the duration of the maximum incubation period of the disease, calculated from the moment of isolation of the last patient and the end of disinfection in the outbreak.

People located in the area of the outbreak of an infectious disease should use cotton-gauze bandages to protect their respiratory organs. For short-term protection, it is recommended to use a handkerchief, scarf, towel or scarf folded in several layers. Safety glasses won't hurt either. It is advisable to use capes and raincoats made of synthetic and rubberized fabrics, coats, padded jackets, rubber shoes, shoes made of leather or its substitutes, leather or rubber gloves (mittens).

The protection of food and water consists mainly of creating conditions that exclude the possibility of their contact with a contaminated atmosphere. All types of tightly closed containers can be reliable means of protection.

Water from taps and artesian wells can be used freely, but it must be boiled.

At the source of an infectious disease, disinfection, disinsection and deratization cannot be avoided.

Disinfection is carried out with the goal of destroying or removing microbes and other pathogens from environmental objects with which a person may come into contact. For disinfection, solutions of bleach and chloramine, Lysol, formaldehyde, etc. are used. In the absence of these substances, hot water with soap or soda is used.

Disinsection is carried out to destroy insects and ticks - carriers of pathogens of infectious diseases. For this purpose, various methods are used: mechanical (beating, shaking, washing), physical (ironing, boiling), chemical (use of insecticides - chlorophos, thiophos, DDT, etc.), combined. To protect against insect bites, repellents are used, which are applied to the skin of exposed parts of the body.

Deratization is carried out to exterminate rodents that are carriers of infectious disease pathogens. It is most often carried out using mechanical devices and chemicals.

Strict adherence to the rules of personal hygiene plays an important role in the prevention of infectious diseases: washing hands with soap after work and before eating; regular washing of the body in a bathhouse, bath, shower with a change of underwear and bed linen; systematic cleaning and shaking of outerwear and bedding; maintaining clean living and working areas; cleaning from dirt and dust, wiping shoes before entering the room; eating only proven products, boiled water and milk, fruits and vegetables washed with boiled water, thoroughly cooked meat and fish.

The success of eliminating an infectious outbreak is largely determined by the active actions and reasonable behavior of the entire population. Everyone must strictly follow the established regime and rules of behavior at work, on the street and at home, and constantly comply with anti-epidemic and sanitary-hygienic standards.

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