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THE INCIDENCE OF AIDS, THE DEFINITION AND CAUSES OF THE DISEASE

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Acquired immunodeficiency syndrome or AIDS (acquired immunodeficiency syndrome, AIDS) is a life-threatening condition of the immune system in which severe infections and tumors develop.

The term AIDS originated in 1981-1982 at the Centers for Disease Control and Prevention in the United States after the development and description of several cases of pneumocystis pneumonia and Kaposi's sarcoma (multiple malignant neoplasms on the skin). The cause of this condition was HIV, which appeared around the 70-80 years.

Causes of AIDS

Almost all cases of AIDS are caused by HIV infection, which is why this term is used to describe the terminal stage of HIV. When the human immunodeficiency virus is present, the immune system cannot adequately respond to emerging external and internal threats.

Other causes of severe immunodeficiency can be harmful radiation, genetic mutations, taking antitumor drugs and much more.

Features of the pathogen

In 1983, Luc Montagnier (Pasteur Institute, France) and Robert Gallo (National Cancer Institute, USA) almost simultaneously discovered the human immunodeficiency virus. The outer shell of the virus, which has a spherical shape with a diameter of up to 120 Nm (0.00012 mm), is represented by a two-layer lipid membrane, into which glycoproteins are embedded, which help to attach and hold on the surface of target cells, and then penetrate them. The inner shell of the virus contains its "heart" - two strands of viral RNA and important enzymes involved in all chemical reactions and internal processes. Just one virus contains several thousand different molecules.

The RNA of the virus contains several genes responsible for replicating new viruses, separating them from an infected cell and evading an immune attack.

HIV-19 has a subtype that is contagious and dangerous only to humans. Initially, it was assumed that the virus was transmitted from chimpanzees.

HIV multiplies only in the human body and dies when exposed to:

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* any disinfectants and antiseptics;
* sunlight and ultraviolet light (from several to ten minutes);
* dirt and sweat;
* sea water and soda.

It also loses activity when heated above 56°C and in an alkaline and acidic environment (for example, soapy water, baking soda, lemon juice, Coca-Cola or beer).

When dried at room temperature without direct sunlight, the virus survives for 7 days. HIV persists in blood syringes for about the same amount of time if its temperature does not exceed 40 ℃ (survival time, amount of virus, temperature, humidity), and at a temperature of about 4 ℃ in dried blood. For two weeks, the virus remains viable in corpses at room temperature.

Despite instability outside the human body, under favorable conditions (conservation), the virus can persist in blood and transfusion components for years. It can also live for 10 years in a frozen state, but dies immediately after defrosting[5][7][8][9].

According to the joint United Nations programme on HIV/AIDS, in the 30 years since the outbreak of the epidemic, 80 million people have become infected with HIV, and at least 36 million have died of AIDS.

According to 2020 data, there are about 37 million people living with HIV in the world (more than half of whom may not know about their diagnosis) — most of those infected live in sub-Saharan Africa. There are more than 1 million registered in Russia. About 388 thousand people were infected with HIV (the real number may be twice as many) and died.

In 2020, 1.5 million people were infected with HIV and 680,000 died of AIDS. At the same time, the number of new HIV infections decreased by 52% compared to 1997, when the largest number of new cases were registered. In addition, the number of deaths from AIDS decreased by 64% (the largest) compared to 2004 [3].

How to get infected with HIV and AIDS

The virus is found in various tissues and cells, but in quantities sufficient to transmit the pathogen, it accumulates only in blood, breast milk, semen and vaginal secretions.

Anyone can get HIV. There are about 1-2% of people with genetic resistance to the virus (CCR5 gene), but it is transmitted only sexually (possibly due to insufficient amounts of the transmitted virus) and is ineffective in substance abuse and blood transfusion.

HIV cannot be transmitted in the following ways:

* air drops - when coughing, sneezing or talking;
* fecal-oral — with feces and urine, when eating food with blood particles of HIV-infected people and using common utensils;

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* contact - sweat, handshakes, simple kisses, non-penetrating sexual acts, in the communal pool, in the bathroom, etc.;

* at the dentist's appointment -after antiseptics and sterilization, HIV dies;

* when taking blood, the sample is made with disposable instruments, the puncture site is sterilized;

* as a result of blood-sucking insect bites - although in areas with a high population, insects are infected with HIV;

HIV infection is possible if three important conditions are met:

* the source of infection is a sick person who is a carrier of the virus;

* a person is susceptible to infection - any healthy person;

* favorable conditions for the transmission of the virus - damaged skin or mucous membranes, ingestion of contaminated material into the body or its mechanical rubbing. At the same time, the dried biological material (blood, semen) does not pose a danger to humans.

Methods of HIV transmission:

* vaginal sex without a condom - both partners are about equally at risk, but most HIV-infected women are infected in this way;

* Sharing needles, syringes and other cutting tools when using drugs;

* Mother-to-child transmission of HIV is possible during pregnancy, childbirth or breastfeeding, with preventive transmission of about 20%, but if the mother is treated for HIV during and after pregnancy, the risk of infecting the child is less than 1% [7][9];

* transfusion of blood and its components, organ and tissue transplantation is a very rare type of transmission, since all materials are carefully checked, and in this case the infection is usually associated with human error or deliberate actions;

* Tattoos and piercings pose a theoretical risk if manipulations are carried out in unsanitary conditions.

AIDS risk factors:

* risky sexual behavior — sex, sex without a condom;

* alcohol consumption;

* Drug use;

* permanent HIV —infected sexual partner-unprotected sex with a patient who has not undergone special HIV therapy;

* Poverty.

The universal spread of HIV/AIDS, when people were not properly informed about the disease, ways of infection, prevention and treatment, caused a condition called "AIDS phobia" -a condition in which a person is constantly afraid of contracting AIDS, detects imaginary symptoms or associates real signs of another disease with AIDS, not trusting the results of repeated negative tests. HIV [1][3][5][7].

Symptoms of AIDS

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Usually, several years after infection, the incubation period continues, during which a person has no obvious symptoms (except for the acute period of the disease). Only after some time, when the virus significantly weakens the immune system, the last stage of the disease begins, in which symptoms of AIDS appear.

On average, 10 years pass from the moment of HIV infection to the development of AIDS, from the development of AIDS to death — from 6 to 22 months. The life expectancy from the moment of infection to death without treatment ranges from 7.5 to 11.6 years [7].

The conditional limit of the onset of AIDS is a sharp decrease in the number of cells of the immune system fighting infections: the level of CD4+ cells is below 0.2×10*9/l (200 cells/ml).

The main sign of AIDS is the development of secondary lesions that directly threaten the patient's life, which are practically not found in healthy people (for example, opportunistic infections and tumors).

Opportunistic infections are diseases in which pathogens usually do not cause diseases and act on the body only under favorable conditions for them. However, the frequency of such infections varies from country to country depending on the prevalence of infectious agents, the patient population and the level of therapy coverage.

Diseases-indicators of AIDS

* Since AIDS is a condition in which other diseases develop, it is more correct to use the term "AIDS indicator diseases", that is, terms related to AIDS:

* * Pneumocystosis is one of the most common infections that lead to death in AIDS. It is usually localized in the lungs, but it can also affect other organs. It is mainly transmitted from humans through the respiratory tract with sputum and mucus. An intrauterine infection is also present. The disease can develop both after activation of a " dormant" infection and with a new infection. It is characterized by sweating and a slow increase in body temperature (up to 38-40 ° C), the gradual development of weakness, intoxication and shortness of breath: at first it appears only during exercise, then it manifests itself more and more and does not go away even in a calm state. At first, the cough looks like an allergy with a feeling of itching behind the sternum, then it descends and intensifies, sputum is not released. Patients look pale, with the development of shortness of breath, the nasolabial triangle turns blue, the frequency of respiratory movements increases from 20 to 60 times per minute, breathing becomes shallow and harsh, wheezing is rarely heard. The pulse also increases, respiratory and cardiovascular insufficiency increases, and pronounced anxiety appears. Chest pain and pneumothorax may develop. If the disease is not treated, the process can be fatal. Among other organ lesions, retinitis, thyroiditis, hepatitis and skin lesions are the most common.

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* * Candidiasis is more common than others. Various manifestations of the disease are possible: from superficial candidiasis to systemic candidiasis with damage to internal organs. With superficial candidiasis, red fluffy blisters or ulcers appear on the skin (most often in the groin, armpits and under the chest), nail damage is possible. Vulvovaginitis often develops. In almost all patients, oral candidiasis manifests itself in various forms and combinations: white plaque in the form of plaque, red and white spots, inflammation of the mucous membrane of the lips and skin, accompanied by burning, change or disappearance of taste. Esophageal candidiasis is characterized by difficulty swallowing, in which the patient experiences pain behind the sternum. Symptoms of damage to the stomach, small intestine and colon, such as nausea, heartburn, discomfort and abdominal pain, stool disorders, weight loss, may also be included, but these symptoms are non-specific. When the respiratory tract is affected, patients experience sore throat, hoarseness of voice, worry about coughing, lung damage may occur (cough with sputum, with development — an increase in body temperature, increased cough with an abundance of sputum and an admixture of blood). There is a risk of candidal meningitis and meningoencephalitis (without specific symptoms).

* Cryptococcosis - usually the infection passes through the lungs and from there spreads to other organs. The nervous system is most often affected (meningitis is a slow increase in fever and headache, accompanied by nausea and vomiting, which do not bring relief). Without treatment, he goes into a coma and dies. The lungs, intracoracic lymph nodes, liver, kidneys, joints, etc. may be damaged.

* Aspergillosis is a very aggressive infection with a major lung lesion. The disease is characterized by an increase in body temperature, fever, cough with shortness of breath, hemoptysis, purulent sputum and chest pain. Most often, lung damage is accompanied by impaired cerebral circulation, the formation of brain abscesses, and sometimes heart abscesses. Bone destruction, sinusitis and oropharyngeal ulcer may develop, accompanied by destruction of soft palate tissues and severe pain.

* Toxoplasmosis is the most common cause of damage to the central nervous system in patients with AIDS (cerebral toxoplasmosis). It usually develops from a "Dormant" form of the parasite. Among the symptoms: fever (may appear suddenly or develop within two months), body temperature up to 38-40 ° C, weakness, memory and attention disorders, pronounced drowsiness. Then there are severe headaches, epileptic seizures, seizures, disorientation, loss of muscle strength and speech. In case of complications (brain tumors), a person may die. In some cases, the disease affects several organs, the main of which are the lungs (dry cough, shortness of breath, decreased blood pressure, impaired blood clotting) and the eyes (blurred vision and the appearance of mosquitoes in front of the eyes).

Cryptosporidiosis is characterized by primary damage to the gastrointestinal tract with dehydration. It is usually transmitted through food and water. In patients with AIDS, cryptosporidiosis is usually considered chronic. It is characterized by frequent (in severe cases up to 90 times a day) watery stools and severe weight loss. In some cases, nausea, vomiting, pain in the right hypochondrium, jaundice, cough and shortness of breath are added.

* Dermatological diseases-rubrophytia (a fungal disease affecting legs, arms and large folds of skin), pityriasis (spots, papules and plaques on the skin), contagious mollusc (many elements of rashes, including on the face), telangiectasia (capillary dilation), glossophytia (darkening of the back of the tongue), hairiness leukoplakia (tongue on the sides), xerosis (dry skin), ichthyosis (thick scales on the skin), papillomas (most often found in the perineum, anal and inguinal zones, itching, burning, may be accompanied by damage to the oropharynx and the development of an oncoprocess).

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