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THE SPREAD OF CORONAVIRUS INFECTION AROUND THE WORLD

Bukhara State Medical Institute
Mirzoyeva Mehriniso Rizoyevna
Sadulloyeva Rushana Sadullayevna

Abstract On January 30, 2020, the World Health Organization (WHO) recognized the outbreak of coronavirus infection in China as a public health emergency of international importance. WHO Director General Tedros Adhanom Ghebreyesus said after a meeting of the emergency committee in Geneva, "I declare an international public health emergency due to the global outbreak of coronavirus." The article presents the current epidemiological indicators of COVID-19 for the territory of Primorsky Krai. The levels of morbidity and incidence of COVID-19 in the CPC, RF for the period from April 14, 2020 to May 14, 2020 have been determined. The etiology and pathogenesis of coronavirus infection are described. Clinical manifestations and risk factors of this infection have been noted. A review of the literature on the current situation in the world has been conducted.

Keywords: incidence of COVID-19; incidence of SARSCoV-2; Etiology of COVID-19; Pathogenesis of COVID-19; coronavirus pandemic; clinical manifestations of coronavirus infection; the situation in the world.

Coronaviruses (lat. Coronaviridae) is a family of viruses that includes, as of January 2020, 40 species of RNA–containing viruses combined into two subfamilies capable of infecting humans and some animals. In humans, coronaviruses can cause a number of diseases – from mild forms of acute respiratory infection to severe acute respiratory syndrome [1]. Coronaviruses pathogenic to humans are HCoV-229E, HCoV-OC43, HCoV-NL63, HCoV-HKU 1, they cause symptoms of ARVI. The pathogens of severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) include viruses of the SARS-CoV and MERS-CoV species. At the end of December 2019, a new coronavirus 2019-nCoV was discovered in China. The infection spread rapidly outside the PRC. According to the World Health Organization, 4.4 million people were infected worldwide on May 14 (+87,572 people per day), 1.6 million recovered, and deaths amounted to 297 thousand people (+5,193 people per day). As of May 14, 252 thousand cases of infection were registered in Russia, 53 thousand people recovered (+5527 people per day), 2305 people died (+93 people per day). The leading region is the Moscow Region, in particular the city of Moscow with 130,588 confirmed cases of infection. Scientific and educational magazine for students and teachers "StudNet" No. 7/2020 On the territory of Primorsky Krai on May 14,

1,057 cases of infection were registered (+49 people per day), which is 0.41% of the number of infected in Russia. Of these, 307 people recovered (+27 people per day), 12 died (+0 people per day) (Fig. 1). The first 2 cases of infection were registered on March 24 [6]. Statistics on morbidity, recovery and mortality from COVID-19 in Primorsky Krai, the United States remains the leader in the number of confirmed cases, according to Hopkins University, where the number of infected exceeded 1.42 million people. Russia is in second place. The UK ranks third with 230,000 infected Spain is in fourth place (230 thousand people). Italy ranks fifth with 222 thousand cases [4]. According to her, such conclusions were made after the start of immunity studies among medical workers in Moscow — the number of people examined by the domestic test system amounted to more than 3.2 thousand people. SARS-CoV-2 coronavirus infection was found in 271 employees of the Federal Penitentiary Service (FSIN). Among the accused and convicted, the disease was laboratory confirmed in 40 people. As told in the Federal Penitentiary Service, there are no patients among them "who have a severe form of the disease." by a person coughing or sneezing, or by airborne droplets when inhaling drops of saliva or secretions from the patient's nose.

Etiology. Coronavirus infection is caused by RNA genomic viruses of the genus Coronavirus. The coronavirus is surrounded by a supercapsid, which is riddled with sparsely spaced spikes having the structure of thin necks and spherical heads located on them, which resembles a crown in appearance. Respiratory and intestinal coronaviruses are pathogenic to humans. The most common type of respiratory disease is usually diagnosed as an acute respiratory viral infection. Some animals (monkeys, birds, snakes, and others) may also be the source of the coronavirus. The source of the new type of pathogen (2019-nCoV) was presumably bats. At the same time, there is currently no evidence that pets (such as dogs or cats) can carry the 2019-nCoV coronavirus.People are very susceptible to coronavirus, and all age groups are susceptible to the disease. The antigenic heterogeneity of viruses causes a significant frequency of re-infection with pathogens of other serological types. Viruses are unstable in the external environment. They instantly die at temperatures above 56 degrees, are destroyed by the action of chloroform, formalin, ethyl alcohol or ether. Coronavirus tolerates freezing well [3]. The new coronavirus infection is especially dangerous, and can be fatal, for the elderly and/or people with concomitant diseases. In particular, people over the age of 65 are more at risk of getting sick and dying from a new coronavirus infection than younger people. People suffering from diabetes, cardiovascular diseases, lung diseases, kidney diseases, liver diseases, hypertension, cancer, people with weakened immune systems are also more vulnerable to this infection. Combining several factors (age + one or more concomitant diseases) leads to a significant increase in risks. Pathogenesis. To date, the pathogenetic mechanisms of the development of coronavirus infection have not been sufficiently studied. The

entrance gate for infection is the mucous membrane of the respiratory tract, diffuse damage to alveolocytes.

Viral pneumonia develops, while the virus causes an increase in the permeability of cell membranes and increased transport of albumin–rich fluid into the interstitial lung tissue and the lumen of the alveoli - interstitial and alveolar edema develops. At the same time, the surfactant is destroyed, which leads to the collapse of the alveoli, as a result of a sharp violation of gas exchange, acute respiratory distress syndrome develops (40% mortality). With the fecal-oral transmission mechanism, the disease manifests itself as a lesion of the gastrointestinal tract, the virus multiplies in intestinal enterocytes. The disease is accompanied by the synthesis of antibodies that do not guarantee protection against re-infection.

Clinical manifestations. For most coronavirus infections, the incubation period is limited to 2-3 days. However, for the 2019-nCoV coronavirus, this period can range from 1 to 14 days (an average of 10 days). Throughout this period, a person can infect others. The disease occurs, most often, as a common flu, parainfluenza or any other acute respiratory infection with all their characteristic signs. Assessment of the situation in the world. About 150 changes have occurred in China since the outbreak began, according to an article published by a group of Chinese scientists in the journal National Science Review.

Scientists analyzed 103 publicly available SARS-CoV 2 (Covid-19) genomes and have already found 149 changes in the strain. Most of them have happened recently. As the study showed, the coronavirus has already distinguished itself into two subtypes: the most common L (70 percent) and S, which accounts for 30%. Scientists note that subtype L was more common in the early stages of the outbreak in Wuhan, but by early January its frequency had decreased. According to the authors of the report, human intervention has exerted strong selective pressure on this subtype, which can be more aggressive and spreads faster. On the other hand, the comparative prevalence of subtype S, which is evolutionarily older and less aggressive, probably increased due to weaker selective pressure. "Our analysis suggests that subtype S is most likely the original version of SARS-CoV-2. The results of our research also support the theory that subtype L is more aggressive than subtype S, as well as that human intervention changed the relative prevalence of subtypes L and S shortly after the outbreak," the article says.

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