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CLINICAL AND LABORATORY FEATURES OF COVID 19 IN PEOPLE

Berdiyarova Shokhida Shukurullayevna
Assistant at the Department of Clinical and Laboratory Diagnostics With a Course of Clinical and Laboratory Diagnostics at the Faculty of Postgraduate Education,

Eshnazarova Ruxshona Olimjon kizi
Xolmatova Sevinchoy Umid qizi
Muhammadiyeva Muxlisabonu Zokir qizi
Students of the Faculty of Pediatrics Samarkand State Medical University,
Uzbekistan, Samarkand

Abstract
Clinical and laboratory parameters were evaluated in young patients hospitalized in an infectious disease hospital with a diagnosis of COVID-19. The study included 89 patients diagnosed with COVID-19 coronavirus infection aged 18 to 44 years, the average age was 35.8 ± 1.6 years: 59 (66.3%) men and 30 (33.7%) women. The clinical picture of the disease in most patients was characterized by the presence of bilateral viral pneumonia in 97% of cases. Concomitant diseases occurred in 32 patients (36%), most often in the group from 35 to 40 years old, while the proportion of cardiovascular diseases and obesity was 51%. Mild severity was registered in 3 (3.4%) patients, the average in 86 (96.6%) patients. In men, compared with women, symptoms of intoxication (50.6% vs. 28.2%) and shortness of breath (28.2% vs. 10.1%), dry cough, dysgeusia and loss of appetite were more common. 73% of patients had varying degrees of respiratory failure (DN), a quarter (26%) had no signs of DN. Keywords: coronavirus, COVID-19, SARS-CoV-2, young people, pneumonia, respiratory failure, computed tomography.

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Introduction

The coronavirus infection caused by the new SARS-CoV-2 betacoronavirus appeared in China in 2019 and spread rapidly around the world, posing the world health care with the most difficult problem of combating a new infectious agent. The COVID-19 pandemic has put a tremendous strain on health systems and caused a global economic crisis around the world. Currently, the total number of infected people on the planet has exceeded 75 million people, and more than 1.5 million deaths have been registered. The situation in the Russian Federation remains extremely tense. The number of infected is about 2 million, of which we have lost over 50,000 of our citizens. In January 2021, the daily increase in cases remained at the level of 20 thousand and above [1-3]. According to the National Health Service, 45% of COVID-19 patients have significantly reduced quality of life after discharge from the hospital and patients need constant medical care and rehabilitation for quite a long time. Large-scale studies to determine the age groups most at risk of coronavirus

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infection show that people can become infected at any age and no group has antibodies against the new coronavirus, since humanity first encountered this pathogen. About one in five people in the world is at risk of getting COVID-19 in severe form.

At the same time, 22% of the world's population (1.7 billion people) have increased risks associated with the presence of background diseases, and another 350 million people (4% of the world's population), even in the absence of background diseases, are at risk of severe COVID-19 with subsequent hospitalization [4]. The probability of dying from a new coronavirus infection depends on age, which follows from global statistics. Thus, the average age of a deceased person in the world is 60 years old, about 80% of deaths in all countries occur in the elderly. More than 60% of the dead had serious chronic diseases during their lifetime in the form of pathology of the cardiovascular and bronchopulmonary systems, diabetes mellitus (DM) and pronounced manifestations of metabolic syndrome. People who have been addicted to nicotine for a long time are also at risk. The average mortality rate in the world is about 3%, and these are patients with pneumonia, and lesions of other organs are not so great. However, statistics may differ significantly from country to country. So, in China, at the very beginning of the COVID19 outbreak, it was noted that among the hospitalized patients there were up to 0.5% of patients under 50 years old, and most of the patients were elderly. During the height of the pandemic, the number of young people began to increase and reached about 20%. In the United States, young and middle–aged people (up to 55 years old) are more likely to get sick, about 31% of those who get sick are over 65 years old, they also accounted for 80% of deaths. In Italy, the data are similar – most of the cases are indeed elderly, and about half of the fatal patients were over 60 years old. At the same time, doctors from South Korea reported that a large number of people over the age of 20 with severe symptoms are admitted to hospitals. In Russia, the percentage of deaths from coronavirus varies by age in different regions, but more than 40% of people admitted to intensive care with complications are under 40 years old. According to official data, the average age of patients in the country is 41 years, and the maximum number of deaths falls on the age group over 65 years [5]. A study of COVID-19 risk factors based on data from 17 million patients [6] revealed that people over 60 with concomitant diseases such as diabetes, hypertension and cardiovascular diseases (CVD) are at high risk of critical conditions and mortality. Some authors note that with an increase in the number of children and young adults examined, the proportion of patients with asymptomatic and mild COVID-19 increases [7].

Trying to answer the question of who statistically dies more often from coronavirus, scientists take into account not only age, but also gender. Men get sick and die one and a half times more often than women (2.8 versus 1.7%, respectively). In South Korea, the statistics were slightly different: women were more often admitted to hospitals, but male patients suffered more from the disease. Scientists believe that gender differences are due to the peculiarities of the spread of nicotine addiction in the population. Where there are more male smokers, they get sick more often and suffer the disease more severely [8]. The high mortality rate and the enormous socio-economic consequences of the COVID-19 epidemic require an analysis of available observations and the development of methods for effective therapy and prevention of complications. It is known that age and concomitant pathology can be risk factors for severe COVID-19, and the influence of comorbid conditions in the risk group has been studied in particular detail. So, it primarily includes the elderly or people with chronic diseases, but young people without chronic diseases can also have potentially fatal complications, such as lightning myocarditis and disseminated intravascular

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coagulopathy (DIC syndrome) [9, 10]. According to Rospotrebnadzor in Russia, the disease is asymptomatic in 23% of patients, 63% of patients have manifestations of acute upper respiratory tract infection, and 14% of patients have viral pneumonia. According to the data available in the world, people aged 60 years and older, as well as people with concomitant diseases, are at risk of severe COVID-19. It is in this group with the risk of developing a severe course that the mortality rate reaches from 50% to 80% according to official statistics from different countries. We must not forget that the risk of infection and severe disease or death affects everyone and is present in all age groups. Research is needed to determine the features of the course of the new coronavirus infection in various age groups. According to the WHO 2020 age classification, young people include people aged 18-44 years. It is assumed that the disease occurs easily in young people, but COVID-19 can occur unpredictably and cause complications in a person of any age. According to CT scans, lung tissue damage of varying degrees was observed in 88% of patients at the time of hospitalization. In dynamics, most patients showed a decrease in the degree of lung damage, but in 30% of cases there was no regression of lung damage at the end of the hospitalization period. It has been established that COVID-19 in young patients proceeds with a high probability of developing complications in the form of pneumonia, the course of which is benign. The absence of regression of viral pneumonia in more than a third of patients requires dispensary monitoring of all patients who have been ill and monitoring of laboratory parameters in dynamics to identify and assess the consequences of a coronavirus infection, as well as the need for further in-depth study of the clinical and immunological features of the course of COVID-19 in various age groups. The purpose of the study. To summarize and systematize the results of studies on the prevalence, diagnosis, clinical picture, vaccination and treatment of children with the new coronavirus infection COVID-19.

Research Materials and Methods

A simple descriptive study based on the analysis of electronic medical records of patients containing complete information about the course of the disease and data from standard laboratory and instrumental examination methods in a hospital setting. The study also includes a physical examination and assessment of vital signs, pulse oximetry with measurement of blood saturation (SP2), assessment of the patient's condition on an ordinal scale of clinical improvement. Specific research methods included: examination of nasopharyngeal and oropharyngeal smears for PCR on SARS-CoV-2 RNA in dynamics; computed tomography of the chest organs (CT OGK); at the entire stage, the patient's status was monitored in dynamics. The study included 89 patients aged 18 to 44 years who were hospitalized in an infectious diseases hospital (GKB No. 40 "Kommunarka"). Upon admission to the hospital, all patients signed an informed voluntary consent to the processing of personal data and medical intervention. Inclusion criteria: age from 18 to 44 years; laboratory-confirmed COVID-19 in the patient; informed consent to the processing of personal data and medical intervention. Criteria for exclusion: age under 18 and over 45 years; pregnancy; absence of a confirmed diagnosis of COVID-19 in the patient and informed voluntary consent to the processing of personal data and medical intervention.

Research Results and Discussion

The results of the study and discussion At the 37th week of work of GKB No. 40 in the status of covid hospital (11/13/20), 15,135 patients were hospitalized, of them with confirmed COVID-19

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– 10 169 a man. 954 patients were treated, 242 of them in the ICU: on ventilator – 46, NIVL – 32, HFO2 – 32, ECMO – 2 people [11]. The mortality rate from the number of infected was 9.1%. Of the total number of hospitalized patients aged 18 to 44 years with confirmed SARS-CoV-2 infection, there were 577 people at the beginning of September 2020. Mortality in this age group was 2.95% (17 patients) [11]. We analyzed 89 case histories of patients aged 18 to 44 years with an average severity of COVID-19. The average age of the patients was 35.8 ± 0.6 years. The majority of the hospitalized patients in this age group were men – 59 people (66.3%) and 30 patients (33.7%) were women. The age distribution in the observation group is shown in Fig. 1. Thus, there were 3 patients aged 18 to 24 years, 7 patients in the 25-29 year old group, 22 people from 30 to 34 years old, and the maximum number were aged 35 to 39 years – 33 patients, from 40 to 44 years inclusive there were 24 patients. Less than half of the patients had concomitant diseases (32 people, 22 of them men, 10 women). Among the concomitant diseases, pathology of the cardiovascular (11), respiratory (7) and digestive systems (6) prevailed, as well as obesity (6) and diabetes (4). There have also been isolated cases of concomitant chronic viral hepatitis C, lung sarcoidosis, and autoimmune thyroiditis. Concomitant pathology was not registered in the group of patients aged 18-24 years. The group of patients aged 35 to 40 years was the most burdened by comorbidity (Fig. 2). Patients often had a combined concomitant pathology. The frequency of registration of concomitant pathology, depending on the age group, is presented. In the initial period of the disease, the most common symptoms were fever (83-98%), dry cough (59-76%), shortness of breath (31-55%), weakness and fatigue (44%). Intoxication syndrome, dry cough, shortness of breath, anosmia, dysgeusia, loss of appetite were registered in men more often than in women. Less common symptoms at the onset of the disease were myalgia (3.3%), headache (16%), nausea or vomiting (23.3%), but more common in women than in men, sore throat (5%), rhinorrhea (4%), and gustatory or olfactory disorders could be in 53% of cases.

Upon admission, the most common hematological change was lymphopenia, observed in 67% of patients, the most pronounced decrease in the number of lymphocytes was observed on 7-9 days from the onset of the disease and returned to normal as they recovered. There was also moderate thrombocytopenia in 17%, leukopenia in 24% of patients; an increase in the level of C-reactive protein (CRP) to 63%; less common disorders were elevated levels of ALT, AST, creatine kinase and D-dimer. The shifts in coagulogram activity were moderate. A smaller proportion of patients had hypercoagulation in terms of activated partial thromboplastin and prothrombin time, and discoagulation was more common. Prolongation of prothrombin time was detected in 26%, and hyperfibrinogenemia was noted in 34% of patients. Thrombocytopenia is described in 5-42% of cases, on average, according to meta-analysis, it is observed in 36% of patients. Given the involvement of platelets in antiviral protection, this is a natural dynamic of the process. Thrombocytopenia (below 100 × 109/l) was observed in 5% of patients. In a meta-analysis of 9 publications containing data on 1,779 COVID-19 patients, mild thrombocytopenia (140 × 109/l, an average decrease of -31 × 109/l) was observed in patients with a more severe course and was associated with a risk of mortality and severe complications with a fivefold relative risk (OR 5.1) [8-17]. It has also been noted by many researchers that a higher temperature, the number of leukocytes and neutrophils in the blood, the level of CRP and D-dimer, the activity of ALT, AST, lactate dehydrogenase and creatine kinase may indicate a severe course of the disease [17-19]. Neutrophilia, elevated levels of D-dimer and lactate dehydrogenase were noted as risk factors for the development of ARDS in the analysis of data from 201 Chinese patients [2-3], which indicates

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the interest of the mechanisms of excessive coagulation and hemolysis in the development of this process. It is known that one of the most common complications of COVID19 is the development of community–acquired polysegmental pneumonia. During the examination of patients by computed tomography of the chest organs, 87 out of 90 of all hospitalized patients had visualization of typical bilateral multiple sites of alveolar infiltration, of medium and high intensity, with a wide base adjacent to the costal pleura or having a drain character; localized mainly in the peripheral parts

Conclusion

The frequency of positive SARS-CoV-2 test results throughout the peak of the pandemic in children was low compared to adults, including those with acute respiratory infection. Children are not only less likely to get infected with the virus, but also carry the infection more easily than adults. The mortality rate in children with COVID-19 was < 0.5%.

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