Asian Pacific Journal of Environment and Cancer
Vol 4 No S1 (2021): Global Challenges and Population's Health International Conference, 19-20 Vov. 2021, Nukus, Uzbekistan, 23-25
Original Research

Clinical and Laboratory Features of Covid-19 in Population of the Aral Sea Region

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The article summarizes the results of a study of a new coronovirus infection and their clinical and laboratory features of the course among patients in the southern Aral Sea region. Anamnestic, general clinical, laboratory-instrumental, statistical, diagnostic-visual and analytical research methods were used. An analysis was made of 97 case histories of patients aged 21 to 83 who were hospitalized in a repurposed hospital for the treatment of patients with coronavirus infection, located in Nukus (Republic of Karakalpakstan), during the period of the maximum peak of the epidemic (from September to November 2020). The prevalence of middle-aged and elderly patients with severe pneumonia (79%), cough - 76.3% and shortness of breath - 69.1% of cases; the disease was accompanied in 58% of cases by an increase in temperature and in 72.2% of cases by a decrease in the level of oxygen in the blood; increase in ESR, glucose, C-reactive protein; also a positive PCR test for coronovirus infection. The data of clinical laboratory and instrumental studies, the detection of COVID-19 inflammation biomarkers indicated damage to the lung tissue

Introduction

In the context of the global spread of coronavirus infection, Uzbekistan has taken priority comprehensive response measures to the sanitary and epidemiological situation to prevent the spread of COVID-19, in addition, in order to provide timely qualified medical care to infected patients or patients with suspected coronavirus infection, temporary centers were promptly erected, and sports complexes and exhibition halls have been converted into hospitals [1-3].

In accordance with analytical reviews of foreign experts and temporary recommendations of scientists from the Russian Federation, the diagnosis of the new COVID-19 virus is based both on the generalized data of the epidemiological history and clinical examination, and on the results of laboratory tests [1, 4, 5, 6]. For the purpose of timely diagnosis, the determination of relevant biomarkers is of particular importance [4]. Depending on the severity of the course of the disease, an appropriate routine blood test is performed to manage the patient and promptly respond to changes in his condition [7, 8]. In critically ill patients, the following is observed: an increased content of markers of inflammatory processes in the blood plasma; the presence of virus RNA in the patient’s blood; elevated blood lactate, D-dimer and lymphopenia; in addition, the severity of the disease is determined based on the degree of saturation of arterial blood with oxygen and respiratory rate (in the absence of sepsis) [3, 7, 6, 9, 10].

Despite the WHO recommendations and the widespread introduction of proven PCR diagnostic tests for COVID-19, in practice, in 20% of cases, a false negative test result was reported, which may be due to the unsatisfactory quality of the test sample (when taken independently), violations of the conditions of transportation to the laboratory, as well as the presence of gaps at the analytical stage of the study [3, 11]. In this regard, conducting research to identify the clinical and diagnostic features of the course of a new coronovirus infection is an urgent task of practical healthcare.

The purpose of the research

To identify the clinical and laboratory features of the course of the disease with a new coronovirus infection among patients living in the southern Aral Sea region.

Materials and Methods

An analysis was made of 97 case histories of patients aged 21 to 83 years who were hospitalized in a youth sports complex, repurposed to treat patients with coronavirus infection (hereinafter referred to as the Center), located in Nukus (Republic of Karakalpakstan) , during the period of the maximum height of the epidemic (from September to November 2020).

The study used anamnestic, general clinical, laboratory- instrumental, statistical, diagnostic-visual and analytical methods using modern equipment. Thus, the determination of the parameters of clinical blood biochemistry was carried out on a biochemical analyzer Mindray BA-88A; the number of leukocytes using a hematological analyzer Siemens-600. Diagnostic visualization of the respiratory organs was carried out using modern digital equipment: Siemens Somatom Emotion 16 - multislice computed tomography (MSCT) and Toshiba Plessart Vivo - X-ray.

Results

Of the total number of patients undergoing inpatient treatment at the Center, 50.5% (49 people) were females, and 49.4% (48 people) were males. The mean age of the patients was 57.9±1.40 years. All patients who underwent coronavirus infection were distributed according to age: from 20 to 30 years old - 4.9%, from 31 to 44 years old - 17.5%, from 45 to 60 years old - 31.9%, from 61 to 74 years old - 38.1% and over 75 years old - 8.2%. From the data presented, it can be concluded that the Center most often received patients in middle and old age.

The results of assessing the condition according to the severity of the course of the disease indicated that patients with moderate severity accounted for 2.1%, with a severe degree - 79.9%, while with an extremely severe degree - 18.6%.

Assessment of clinical manifestations among patients of the Center showed that subfebrile temperature (from 37 to 38˚) was observed in 17.5% of patients, febrile (from 38.1 to 39˚) - in 32.9%, hectic (more than 39 ˚) - in 8.2%, and in the rest of the patients, the body temperature was within normal limits; patients complained of fever - 58%, cough - 76.3% and shortness of breath in 69.1% of cases; respiratory rate within the normal range (16-20) was observed in 36.08%, increased (more than 20) in 63.92% of cases, and the blood oxygen saturation (saturation) in 27.8% of cases remained within the normal range, and in 72.2% of cases it decreased due to developing respiratory failure in pneumonia.

The results of general and biochemical blood tests among patients with coronovirus infection indicated an increase in the following indicators: the number of leukocytes - in 4.1% of cases and the erythrocyte sedimentation rate (ESR) - in 51.5% of cases, which indicates the activity of the inflammatory process; glucose - in 37.1%, which confirms the data of foreign authors on damage to pancreatic tissues in COVID-19 [12]; fibrinogen - in 17.5% of cases, which indicates the systemic nature of the inflammatory process [13], C-reactive protein - in 100% of cases, which is one of the main laboratory markers of the activity of the pathological process in the lungs during coronavirus infection [2, 14]. Of all admitted patients, the results of a PCR test for coronavirus infection in 96.9% of patients were positive, and only 3.1% were negative, which in turn is possibly associated with an error in collection, transportation and / or diagnosis (late delivery biomaterial, etc.).

The results of X-ray and MSCT studies of the lungs of the Center’s patients indicated damage of the

lung tissue in the form of: pneumonia 90.7%, while bilateral polysegmental pneumonia was mainly observed (94.3% of cases), and in other cases unilateral and focal (4.6 and 1.1% of cases, respectively); chronic bronchitis - in 5.2% of cases, bronchopneumonia - in 2.1% of cases. Thus, in almost all patients who were hospitalized at the Center, COVID-2019 disease was accompanied by damage to both lobes of the lungs.

Thus, when identifying the features of the clinical course of the disease with a new coronovirus infection among the hospitalized patients of the Aral Sea Center, men and women almost made up an equal number; out of the total number of admitted patients, middle-aged and elderly patients with a severe degree of severity prevailed; the disease was accompanied in most cases by an increase in temperature and a decrease in the level of oxygen in the blood; the most significant changes in blood biochemical parameters included: an increase in ESR, glucose, C-reactive protein; also a positive PCR test for coronovirus infection. In addition, the data of X-ray and MSCT studies indicated damage of the lung tissue.

In conclusion, the results of the analysis allow us to make conclusion that the incidence of a new coronovirus infection among people living in the Aral Sea region did not depend on gender, i.e. both males and females were equally affected; however, the development of the disease depended on age, where the high-risk group consisted of middle-aged and elderly people; the most frequently observed severe course, which was characterized by bilateral pneumonia. The results of laboratory and instrumental studies made it possible, first of all, to monitor the monitoring of hemostasis system disorders, and the detection of biomarkers and mediators of COVID-19 inflammation made it possible to establish an accurate diagnosis. The presented material will serve as the basis for taking timely and adequate measures to identify, treat and rehabilitate patients with a new coronovirus infection.

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