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RESEARCH METHODS FOR DIAGNOSING IKE COVID - 19 ON THE BACKGROUND OF PNEUMONIAAND

Safoev B.B., Turdiev H.K., Yarikulov Sh.Sh., Ubaidullaev B.B.
Bukhara State Medical Institute

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Abstract:

Relevance. The COVID-19 viral infection, to which the WHO has assigned the category of a pandemic, is caused by a representative of a group of coronaviruses, which, in turn, belong to the family of seasonal SARS. The disease SARS-CoV-2, called COVID-19, was officially declared a pandemic by the World Health Organization on March 11, 2020. SARS-CoV-2 contains a single-stranded RNA genome with a positive meaning, surrounded by an extracellular membrane containing a series of spiked glycoproteins resembling a corona.

An increase in the number of acute lung abscesses, pleural empyema, high disability and lethality necessitate the search for new methods of diagnosis and treatment. Despite advances in the treatment of pulmonary destruction, mortality remains high, and in complicated forms, a large percentage of deaths are observed. Therefore, the search for new approaches to thediagnosis and treatment of purulent-inflammatory diseases of the lungs is relevant today.

Materials and methods of research. The data of examination and treatment of 74 patients with moderate severity of COVID-19, who died from July to August 2020 in a specialized hospital, were analyzed, and an organization was formed for the treatment of patients with COVID-19 by the Bukhara State Medical Institute in the dormitory of the Bukhara Technological Institute. When assessingthe condition and method of treatment, we were guided bythe belt recommendations for the management of patients infected with COVID-19 - No. 7 approved by the Ministry of Health of the Republic of Uzbekistan on 15.08.2020 According to the protocol, patients with COVID -19, depending on the severity of the disease, are divided into 4 groups. The protocol provides specific recommendations on the scope of examination and treatment taking into account the severity of the condition of patients.

Conclusion. When assessing the condition of patients with COVID-19 associated pneumonia, indicators of intoxication, blood coagulation system and SpO2% of blood are of important importance. The main criteria for assessing the state of the coagulogram in COVID-19 are*:* D-dimer; PV; Platelets; Blood Fibrinogen.

Keywords: COVID-19, SARS-CoV-2, covid-19 - associated pneumonia

TOPICALITY. The COVID-19 viral infection, to which the WHO has assigned the category of a pandemic, is caused by a representative of a group of coronaviruses, which, in turn, belong to the family of seasonal SARS. The disease SARS-CoV-2, called COVID-19, was officially declared a pandemic by the World Health Organization on March 11, 2020. SARS-CoV-2 contains a single-stranded positive-sense RNA genome surrounded by an extracellular membrane containing a series of spiked glycoproteins resembling a corona.[2,3]

An increase in the number of acute lung abscesses, pleural empyema, high disability and lethality necessitate the search for new methods of diagnosis and treatment.

Imaging techniques such as a simple chest X-ray and computed tomography (CT) scans are important tools in evaluating patients with chronic obstructive pulmonary disease (COPD) of any etiology. These methods facilitate the differential diagnosis and evaluation of individual lung pathologies, such asemphysema, bulla, or fibrosis [4,8].

COVID-19 induced hypercoagulation is explained by dysfunction of endothelial cells, which in turn leads to excessive thrombin formation and a decrease inthe activity of fibrinolysis [4]. The ability of coronaviruses to

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penetrate directly into the bone marrow, andto destroy the processes of hematopoiesis [5] is not excluded.

Violations of coagulation lead to thrombotic complications, which are clinically significant. The resulting microthrombosis, disrupting microcirculation, can significantly aggravate the course of acute respiratory failure in patients with COVID-19. Therefore, the treatment of COVID-19 must necessarily include measures aimed at correcting violations ofge mostaz [6,8].

An analysis of the literature shows that the COVID-19 pandemic has complicated the treatment of lung diseases. There is currently insufficient evidence that any existing antiviral drugs can effectively treat COVID-19 pneumonia [1,7].

Despite advances in the treatment of pulmonary destruction, mortality remains high, and with waspsof false forms, a higherpercentage of deaths is observed. Therefore, the search for newways to diagnose and treat purulent-inflammatory lung diseases is relevant today.

MATERIALS AND METHODS.

The data of examination and treatment of 74 patients with moderate severity of COVID-19,who died from July to August 2020 in a specialized hospital, were analyzed, and an organization was formed for the treatment of patients with COVID-19 by the Bukhara State Medical Institute in the dormitory of the Bukhara Technological Institute. When assessingthe condition and method of treatment, we were guided bythe belt recommendations for the management of patients infected with COVID-19 - No. 7 approved by the Ministry of Health of the Republic of Uzbekistan on 15.08.2020 According to the protocol, patients with COVID -19, depending on the severity of the disease, are divided into 4 groups. The recommendations give specific recommendations on the scope of the examination and treatment, taking into account the severity of the patient's condition.

All patients, depending on sex and age, were divided into groups according to the classification adopted at the regional seminar by the World Health Organization.

Of the 74 patients examined, 68 (66.6%) were men, 34 (33.4%) were female, aged 17 to 76 years (average age was 48.42.1 years). All patients examined on the day of admission were urgently started complex therapy for the treatment of ± COVID-19, drugs based on Protocol No. 7 recommended by the Ministry of Health of the Republic of Uzbekistan.

From the moment of admission, all patients were measured body temperature, respiratory rate, an objective study of the lungs (auscultation, percussion), pulse oximetry, X-ray examination of the lungs, and, if necessary, MSCT of the chest. When collecting anamnesis, attention was focused on determining the duration of the disease and contact of patients with COVID-19 patients.

To determine the level of oxygen saturation of the capillary blood of the body, the $SpO_{of\ 2}$% was studied using a pulse oximeter apparatus by fixing the device on the end of the phalanx of the patient's hand.

All admitted patients from the day of hospitalization and in dynamics were determined indicators of body temperature and blood intoxication: Leukocytes of the blood, LII, MSM, ESR of blood. Indicators of D - dimer are studied; Prothrombin time; Platelets; Blood fibrinogen.

RESULTS AND DISCUSSIONS.

All patients examined were admitted with COVID-19 associated pneumonia, which was confirmed on X-ray radiological examination.

As noted above, patients on the day of admission began conservative therapy on an emergency basis in thebelt recommendations for the management of patients infected with COVID-19 No. 7. From the moment of admission, all patients were given a nasopharyngeal swab to verify the diagnosis using the polymerase chain reaction (PCR) method for COVID-19, regardless of clinical manifestations, the detection of specific antibodies in the blood (IgA; IgM and/or IgG) to SARS-CoV-2, thermometry, measured respiratory rate. An objective study of the lungs (auscultation, percussion), pulse oximetry, X-ray examination of the lungs, and, if necessary, MSCT of the chest were carried out. Taking into account the results of clinical and X-ray radiological studies, all patients, if necessary, were given oxygen therapy using the CPAP or Bobrov apparatus.

The effectiveness of treatment was assessed by the dynamics of the results of clinical and X-ray radiological studies (X-ray, MSCT). The condition of the lung tissue and the assessment of the degree of lung damage were assessed by conducting MSCT or X-ray studies. The main criterion for the treatment of COVID-19 was the results of a PCR study from the nasopharynx for COVID-19 and the detection of antibodies to SARS-CoV-2 in the blood. Important indicators for assessing the condition of the patient were the results of the study of the indicatorof blood intoxication: blood leukocytes, LII, MSM, blood ESR, indicators of D -dimer; PV; Platelets; Blood Fibrinogen, and MSCT of the lung in dynamics.

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Analysis of laboratory indicators of intoxication of the body in the examined patients revealed the following changes (Table 1). As shown in the table, on the first day of treatment, the body temperature of patients averaged 38.01±0.30. The content of leukocytes of blood was an average of 8.21 0.11 x 10±^{9} / l. The volume of MSM 0.1780.017±units. Similarly, an increase in FRI and ESR was noted.

Table 1 Resource requirements by component
Dynamics of intoxication rates in surveyed patients with COVID-19 associated pneumonia (n = 74).

Indicators	Observation time			
	Day of admission	Day 3	Day 7	Day 14
t^{0} тела	38,01±0,30	37,25±0,17***	36,9±0,14***	36,700,21±
L крови ×10^{9}/l	8,21±0,11	7,18±0,17***	6,37±0,32*	7,78±0,18*
MSM units	0,178±0,017	0,152±0,09	0,14±0,023**	0,131±0,003*
LII units	1,69±0,12	1,28±0,05	1,00,03**±	1,00,03±
ESR mm/h	52,71±2,50	44,43±1,14	35,65±2,18*	26,21±2,14***

Note: * - reliability of the difference inrelation to the data of the previous day значимы (* - P<0.05, ** - P<0.01, *** - P<0.001).

On the third day of treatment, there is a slight decrease in body temperature to 37.25±0.17, the number of blood leukocytes decreased to an average of 7.18±0.17×10^{9} / L. The volume of average molecules averaged 0.152±0.09units. There was a decrease in LII and ESR to 1.28±0.05 and 44.43 ±1.14 respectively.

By the seventh day of treatment, the examined patients retained a slight febrilitude (36.9 0.1±4). At the same time, according to all laboratory indicators of intoxication of the body: L, MSM, LII and blood ESR, their further decrease was noted, that is, there was a tendency to normalization - 6.37±0.32×10^{9}; 0.140±0.023; 1.00.03; 3±5.65±2.18, respectively. By the fourteenth day of treatment, these indicators, although they tended to further normalize, remained above normal.

With further treatment and observation by the seventh day, all analyzed indicators of intoxication, except for blood ESR, were within the reference values.

In the following, the compositionof patients was studied according to pulse oximetry indicators - SpO$_2$%. Upon admissionand in patients, a slight deviation of SpO$_{\text{indicators of 2}}$% from normal values was observed, that is, - 9 2.62±0.08% (Table 2. 2)

Table 2 Resource requirements by component
Dynamics of pulse oximetry indicators of the examined patients (n = 74)

Показатель SpO$_2$ %				Normal SpO values $_{of\ 2}$% according to WHO (2009). SpO$_2$ - 95% or higher
Day of admission	3 overnights	7 overnights	14 overnights	
92,62±0,08	93,74±0,13	94,24±0,32	96,10±0,36*	

Note: * - reliability of the difference inrelation to the data of the previous day значимы (* - P<0.05, ** - P<0.01, *** - P<0.001).

Against the background of the therapy, the pulse oximetry indicators of SpO$_2$% slowly tended to normalize. By the thirdday of treatment, the dynamic growth curveof the SpO$_2$% indicator was insignificant. By the 6-7 days of treatment, there was a positive dynamics of the SpO 2% indicator, reaching 94.24±0.32, which corresponds to the lower limit of the norm. On average, the increase in the oxygen

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saturation of tissues at this time reached up to 0.5% of the initial one. In the future, with dynamic increase by the 14th day - up to 96.10±0.36, which significantly differs from the initial indicators by an average of 2.14%.

To verify the diagnosis of COVID -19 as mentioned above, all patients underwent a PCR test from the nasopharynx. It should be noted that 2% of patients at the time of admission had confirmed results of a PCR test for COVID-19. The rest of all patients with a PCR test for COVID-19 were performed on the day of admission. According to the results of the PCR study, 45% of patients had a false positive result of the coronavirus test, 55% of patients had positive PCR tests. Given the presence of clinical signs such as: anosmia, headaches, fever, patients whose PCR test showed a false negative or negative result, were diagnosed with COVID - 19. All of these patients anamnestically had contact with COVID - 19 patients within the last 14 days, before admission. 70% of patients in the family had patients with confirmed tests for COVID-19.

A dynamic study of hemostasis indicators of the examined patients revealed the following indicators: D-dimer on the day of admission were higher than normal, which averaged 1544 ng / ml; The indicator of thrombosed time was - 14 seconds; Platelets and Fibrinogen were above normal 222 * 10 ^ 9 / l, and 4.4 g / l, respectively. Table 3

Table 3 Resource requirements by component

Indicators of hemostasis in the examined patients (n = 74)

Index	Indicator in dynamics				
	Day of admission	3 overnights	7 overnights	14 overnights	reference values
D-димер	1544 ng/ml	958 ng/ml	554 ng/ml	325 ng/ml	0-500 ng/ml
PV	15 sec	13 sec	12sec	12 sec	11-16 seconds
Platelets	222 *10^9/L	186 *10^9/L	177 *10^9/L	172 *10^9/L	150 - 400 *10^9/l
Fibrinogen	4,4 g/l	4,2 g/l	4,1 g/l	4,1 g/l	2—4 g/l

Note: * - reliability of the difference inrelation to the data of the previous day значимы (* - P<0.05, ** - P<0.01, *** - P<0.001).

Against the background of complex treatment with the use of heparin anticoagulants and low molecular weight heparins (clexane, enoxyparin), all these indicators gradually normalized in dynamics by the 7-8th day of treatment.

The main radiological signs of COVID-19 associated pneumonia in the examined patients were the following symptoms: numerous compactions of the lung tissue of the "frosted glass" type, with the involvement of the lung parenchyma up to 25-40%, occurred in 68 (66.6%) patients, similar to foggy compaction of the lungs, while preserving the contours of the bronchi and blood vessels.

Less often on the CT scan there were signs: areas of consolidation, perilobular seals in 19 (18.6%) patients; symptom of air bronchogram, traction bronchiectasis in 7 (6.8%) ; pleural effusion, hydrothorax in 2 (1.9%) bilateral, prevails on the left. All these signs were mainly determined on the 6-10th day of the disease.

In the process of complex treatment synchronously with the improvement of the general condition and clinical and laboratory data of the examined CT patients, the

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picture also had a positive trend. By 7-8 days of treatment, in most cases, the patients examined had normal CT pictures, it should be noted that in 20-25% of patients at this stage of treatment with CT examination, residual phenomena of the X-ray picture were noted.

FINDINGS:

1. When assessing the condition of patients with COVID-19 associated pneumonia, the MSCT picture, intoxication rates and SpOof 2% of the blood are important.
2. The main criteria for assessing the state of the coagulogram in COVID-19 are*:* D-dimer; PV; Platelets; Blood Fibrinogen.

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