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RADIATION DIAGNOSIS OF COVID-19 ASSOCIATED WITH PNEUMONIA

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Relevance. The year 2020 was marked by important events in the field of public health for all mankind: on January 30, at the second meeting of the WHO Emergency Committee, the epidemic caused by the SARS-CoV-2 coronavirus was recognized as an "emergency of international importance" [1; 3].

The pandemic has attracted the attention of specialists all over the world, since earlier coronavirus infections in humans did not go beyond the permissible level of biological risk, but the consequences of mutations of these viruses indicate that the transformations of the latter can lead to unforeseen consequences. Thus, today the question of the need for timely high-precision diagnosis of coronavirus infection is becoming more and more urgent [4].

The widespread detection and determination of diagnostic and radiological signs in COVID-19 diseases will not only clarify the epidemiological situation, but also form a holistic view of the main pathogenetic links of the disease, as well as improve the quality of therapeutic and preventive measures. Coronaviruses, which got their name due to some morphological features, are members of a large range of Riboviria RNA viruses. According to modern nomenclature, they are included in the order Nidovirales, the suborder Cornidovirinneae, the family Coronaviridae, the subfamily Orthocoronavirinnae [2,4].

The purpose of the study: to study the X-ray radiological features of patients with an average degree of COVID-19.

Material and methods

The article presents an analysis of the results of X-ray radiological studies of 102 patients with COVID-19 of moderate severity who received treatment at the peak of the July-August 2020 pandemic in the COVID-19 specialized hospital at the dormitory of the Technological Institute in the city of Bukhara.

It should be noted that 326 patients with COVID-19 received inpatient treatment in the hospital during this period. The method of treatment was carried out according to protocol No. 6, on the recommendation approved by the Ministry of Health of the Republic.Uzbekistan on the examination and treatment of COVID - 19 from 31.07.2020. According to the protocol, patients with COVID - 19, depending on the severity of the disease, are conditionally divided into 3 groups. And specific recommendations are given on the scope of research and treatment, taking into account the severity of patients.

Of the 326 patients with COVID-19, 102 (31.2%) had moderate lung damage, 224 (68.7%) patients had severe lung damage with COVID-19.

This article provides an analysis of the radiological data of the studied patients with moderate severity of lung damage.

Of the 102 examined patients with covid pneumonia, 61 (59.8%) were male and 51 (41.2%) women aged 17 to 85 years. The average age was 52.6±1.8 years.

The main complaints at admission in patients were - an increase in body temperature (up to 90%); Dry cough or with a small amount of sputum (72.3% of cases); Shortness of breath (28%); Fatigue (47.8%); A feeling of congestion in the chest (20.2%);

Sore throat (11.6%); runny nose (57.0%), decreased sense of smell and taste (82.8%); signs of conjunctivitis (22.0%) of cases.

All the examined patients had complications of pneumonia, which was confirmed by X-ray radiological examination.

Out of 102 patients, in most cases (95.1%), bilateral covid pneumonia was observed with predominant middle (32.8%) and lower (62.3%), unilateral pneumonia was observed in (5.8%) patients, of which right-sided pneumonia was in (3.7%), and left-sided COVID-19 pneumonia was in (2.1%) patients.

To accurately establish the diagnosis of COVID - 19, all patients underwent a PCR study from the nasopharynx. It should be noted that 2% of patients at the time of admission had confirmed PCR results on their hands. The rest of all patients from the moment of admission were carried out in a PCR study in the hospital. According to the results of the PCR study, 45% of patients had suspected coronavirus, 55% of patients had confirmed PCR tests for coronavirus. Taking into account the presence of clinical signs such as: anosmia, headaches, an increase in body temperature, in the anamnesis of patients to whom the PCR study showed suspicion of coronavirus, a diagnosis of COVD -19 was established. All of them had a history of having had contact with patients with CVD -19 during the last 14 days, before the admission of patients. 70% of patients in the family had patients with confirmed COVID - 19.

Conservative treatment according to protocol 6 was urgently started for all patients from the moment of admission. From the moment of admission, all patients from the nasopharynx underwent a PCR study on COVID - 19, body temperature, respiratory rate were measured, objective lung examination (auscultation, percussion), lung spirography, pulse oximetry, X-ray examination and, if necessary, chest MSCT. Taking into account the results of clinical and radiological studies, all examined patients, if necessary, underwent oxygen therapy using SPAP devices or Bobrov divice.

Results and discussions

When evaluating X-ray images and MSCT of the chest of patients with COVID - 19, we followed the classification of Russian scientists. S.P. Morozov, D.N. Protsenko, S.V. Smetanina [et al.]. 2020.

The essence of the classification is as follows:

– **CT-0** (norm): norm and absence of CT signs of viral pneumonia against the background of a typical clinical picture and relevant epidemiological history (however, according to CT results, radiological signs of inflammatory lesions may be absent in 18% of patients with mild disease, as well as in the early stages of the disease);

– CT-1 (light): sealing zones of the "frosted glass" type, involvement of the lung parenchyma <25%;

– **CT-2** (medium-heavy): sealing zones of the "frosted glass" type, involvement of the lung parenchyma 25-50%;

– **CT-3** (heavy): areas of "frosted glass" type compaction, consolidation zones, involvement of lung parenchyma 50-75%, increase in lesion volume 50% in 24-48 hours against the background of respiratory disorders, if studies are performed in dynamics;

– **CT-4** (critical): diffuse compaction of lung tissue by the type of "frosted glass" and consolidation in combination with reticular changes, pleural effusion (bilateral, predominant on the left), involvement of lung parenchyma >75%.

It should be noted that out of 102 examined patients of group IA, 38 (37.2%) had a CT-1 form of X-ray radiological picture. 64 (32.8%) had CT-2 form of X-ray radiological picture. Which corresponds to patients with moderate severity COVID - 19.

99 (97.1%) patients had lesions on 2 sides, 3 (2.9%) patients had unilateral lung damage.

The main radiographic signs of lung damage in patients with COVID-19 were the following symptoms of COVID-19 associated pneumonia: numerous "frosted glass" type lung tissue seals, involving lung parenchyma up to 25-50%, were found in 68 (66.6%) patients where areas similar to foggy lung compaction are characteristic, with the preservation of contours bronchi and vessels, the substrate of the pattern is filling of the alveoli with liquid with the formation of a foam–like substance. On CT, seals by the type of frosted glass are defined as delicate alveolar densities, against which the visualization of the vessels of the lungs is preserved, in contrast to consolidation, in which the vascular architecture is not differentiated.

In 22 (32.3%) patients with a CT picture of frosted glass, there were areas of consolidation, thickening of the interlobular interstitium of the "cobblestone pavement" type, peripheral, multilobar localization.

Lung damage was mainly 99 (97.0%) bilateral, which in our opinion is one of the distinguishing features of COVID - 19 associated pneumonia from surgical purulent inflammatory lung diseases.

Infrequent signs of CT examination in patients were:

– areas of consolidation, perilobular seals in 19 (18.6%) patients

– symptom of an air bronchogram, traction bronchiectasis in 7(6.8%);

– 2 (1.9%) patients had bilateral hydrothorax with pleural effusion. All these signs were mainly determined on the 6th-10th day of the disease.

In the process of complex treatment synchronously with the improvement of the general condition and clinical X-ray laboratory data of the examined patients, the CT picture also had a positive trend by 7-8 days of treatment, in most cases they had a normal CT picture. It should be noted that in 20-25% of patients at this time, residual phenomena of the X-ray picture were noted during CT examination.

Conclusions:

1 MSCT diagnostics is a more effective method for establishing the diagnosis of pulmonary complications of COVID – 19

2 The radiological picture of COVID – 19 associated pneumonia has some similar radiological data with pneumonia and lung abscess of bacteriololgic etiology. What

dictates the need for additional scientific research on differential diagnosis by X-ray picture in these pathologies.

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