International Journal of
Health Systems and Medical Science

ISSN: 2833-7433
Volume 1 | No 4 | Oct-2022

General and Castle Views On Pneumonia Caused by Coronavirus Infection in the Lungs

Jonibekov Jasurbek Jonibekovich [1]

[1,] Bukhara State Medical Institute

Relevance: As of December 2019, the severe respiratory syndrome pandemic caused by the COVID-19 coronavirus is spreading worldwide. As the cause of this outbreak, a new RNA containing a virus called 2019-nCoV belonging to the Coronaviridae family was identified, which is officially known as “severe acute respiratory syndrome coronavirus (SARS-CoV-2)”, which will later be called new? "Coronavirus disease 2019" (COVID-19). As the incidence is growing rapidly worldwide, on March 11, 2020, WHO announced the beginning of the COVID-19 pandemic. The main source of infection is a sick person, including during the incubation period of the disease. The leading pathway of SARS-CoV-2 transmission is airborne, mainly when coughing, sneezing and talking at close range (less than 2 m).

There are various theories about the pathophysiology of the process occurring in the lung tissue in COVID-19. We are more inclined to the leading theory, which is that the SARS-CoV-2 virus interacts with body tissues through the receptors of the ACE-2 angiotensin converting enzyme found in various tissues, mainly in the lung parenchyma. In the pulmonary alveoli and bronchi, as well as in the nasopharynx, heart and blood vessels. Currently, it is known about the circulation among the population of four coronaviruses (HCo-229e, -OC43, -NL63, -HCU1), which are constantly present in the composition of ARVI pathogens and most often cause respiratory viruses. damage to the tract from mild to moderate severity. This virus belongs to the II group of pathogenicity. The entrance gates of the pathogen are the epithelium of the upper respiratory tract and epithelial cells of the stomach and intestines. The pathogenesis is based on the process of increasing the permeability of cell membranes and increasing the penetration of albumin-rich fluid into the alveolar cavity under the action of the virus. As a result, the destruction of the surfactant leads to the destruction of the alveoli and the development of acute respiratory distress syndrome. The concomitant immunosuppressive status of the patient contributes to the development of opportunistic bacterial and mycotic infections of the respiratory tract [1.3.5.7.9.11].

The clinical spectrum of COVID-19 is quite wide and includes asymptomatic forms, mild forms affecting the upper respiratory tract, as well as severe pneumonia, which can lead to respiratory disorders. COVID-19 is characterized by the presence of clinical symptoms of acute respiratory viral infection, such as fever, cough (dry or with less sputum), shortness of breath, fatigue, and discomfort in the chest. Abdominal and diarrhea syndromes can also be observed. Most patients have an asymptomatic, mild, or moderate course of the disease, but in 5-10% of cases, pneumonia accompanied by hypoxia, acute respiratory distress syndrome, and multiple organ failure develop [3.4].

Comprehensive diagnosis of COVID-19 is carried out with a concentrated epidemiological history, clinical picture, beam diagnosis and results of laboratory studies [3]. Disease testing implies obtaining a positive laboratory test of the material obtained by taking nucleic acid in a tampon from the nasopharynx and/or oropharynx for the presence of SARS-CoV-2 RNA using specific methods [5]. Modern clinical practice cannot be imagined without diagnostic methods, including CT, X-ray

and ultrasound methods of the lungs. Computed tomography (CT) provides more information, is a high-precision method that allows you to fully visualize the organs of the chest and determine the stage of the process. This is the second stage of diagnosis and more accurate diagnosis after a chest X-ray [11.14]. Despite the presence of generally accepted diagnostic protocols, if a new coronavirus infection is suspected, in a number of cases it is increasingly difficult to detect changes in lung tissue in time in the regard.

The guidelines for the Russian society of Radiology and the Russian Association of specialists in ultrasound diagnostics in medicine provide a list of radiological methods for lung diseases in which COVID-19 is used for coronavirus infection (chest X-ray, Computed Tomography of the lungs and constitute a lung ultrasound, diagnostic algorithm. Instructions X-ray departments of a health institution offer recommendations on working models, the procedure for conducting an examination, the provision of a description and assessment of changes. Schemes of X-ray and CT protocols are presented in the evaluation of existing or suspected COVID-19-related pneumonia in the lungs and chest, as well as preliminary examination and changes. A chest X-ray has a low sensitivity to detect initial changes in the early days of this disease and is not recommended for early diagnosis. Mobile radiography is an important tool in the diagnosis of pulmonary pathology in intensive care units. CT is the most sensitive way to detect lung changes typical of covid-19-related pneumonia. In patients with severe and progressive forms of the disease, it is recommended to use CT for a preliminary assessment of the chest organs, as well as differential diagnosis and observation. Lung UTT-suspicious / known may look good in patients with covid-19-related pneumonia. UTT has become an additional imaging method that does not replace or exclude X-ray and CT. If the correct imaging, the correct indications are selected and there are trained medical personnel, this research method is very sensitive in detecting interstitial changes and consolidation processes in the lung tissue, but can only correct the difficulty in their subplebral location. According to the data of some scientists, it does not allow to accurately determine the causes of changes in lung tissue and/or the actual size of the lungs. When describing information about the possibility of COVID-19 pneumonia and its aggressiveness, it is necessary to use its instructions (CT and X-ray). Observation using a CT or X-ray method depends on clinical indications that require dynamic evaluation. In patients who do not have significant changes in their clinical condition outside the intensive care unit, the recommended frequency of repetition of CT and X-ray is no more than once every 5-7 days. An objective assessment of pathological changes in dynamics can only be used when comparing data from studies of the same type[2.4.6.8.10.12.14.16.18].

The X-ray (RG) method of standard examinations has low sensitivity to detect initial changes in the early days of the disease and is not available for early diagnosis. The importance of RG makes it possible to distinguish in periods of severe course of pneumonia. Mobile X-ray is the main method of radiological diagnostics of the pathology of the chest organs in intensive care units using hardware devices. The use of its portable apparatus provides convenient opportunities during an epidemic. An important advantage of RG compared to CT is its high permeability and less effort for anti-epidemic measures. The method allows us to reliably identify pneumonia of various degrees and severe forms of pulmonary edema, requiring hospitalization, including referral to an intensive care unit.

As you know, similar lung syndromes are caused by other strains of the family. The most notable examples are severe acute respiratory syndrome (SARS) and Middle Eastern respiratory syndrome (MERS). The emergence of atypical disease pneumonia (SARS) has been discontinued and there have been no reports of infection in humans since 2003. Reports of minor MERS epidemics continue. X-ray diagnostic methods are the most important component of the examination. With this method, there is an opportunity to monitor the clinical condition of patients, the development of the disease and determine the treatment strategy for lung syndromes associated with coronavirus infection. In the acute and chronic stages of SARS and MERS,X-ray imaging is variable and nonspecific [5.7.8.9].

Scientific studies carried out by Wong Hyf show that as a result of retrospective analysis in 64 patients, changes can only be seen in the initial period in 69% of cases on X-rays in cases where COVID-19 has been confirmed. Lee E and hamuallifs noted in scientific research that in patients

who underwent X-rays and CT scans, 40% of X-rays did not detect changes but were recorded in CT scans. Lung X-ray examination has a low sensitivity and cannot distinguish foci of the "pale window" type, which are considered the first changes in COVID-19. For this reason, American College of Radiology did not recommend the use of the X-ray method in the early diagnosis of COVID-19 and as a screening method.

Pulmonary ultrasound is a very accurate imaging method to detect damage to the lungs and pleura. There is a need for a quick assessment of the condition of the lungs in patients with suspected COVID-19 during pregnancy. High incidence of infectious diseases of the population in the territory of the Republic of Uzbekistan (20.07.20. 113,072 cases have been recorded) [4] and as a result of this, the development of additional rational algorithms for diagnosing pneumonia becomes relevant, given that a large load on the health system is falling. Nevertheless, in this situation, Temporary Recommendations have been developed on the feasibility of conducting an ultrasound scan to diagnose pneumonia in the conditions of COVID-19 . Lung ultrasound has greater sensitivity than 90% and specificity above 95% as a diagnostic tool, including the possibility of transmission in pregnant women.

It should be noted that performing an ultrasound examination of the lungs does not cancel a CT or X-ray examination and at the same time does not replace it, since it allows only to assess subplebral changes. The results of the conducted study largely depend on the qualifications of the specialist. Ultrasound of the lungs in pregnant women is recommended for an urgent preliminary assessment of the presence/absence of lung tissue damage, as well as severity levels. The advantage of this method is that it is possible to do it directly in the patient's room, or in the presence of the possibility that the patient is in bed. This is important with repeated repetition of the method over and over again and the absence of radiation. The main thing is UTT ease of disinfection of the device. Due to the significant decrease in ultrasound due to the presence of air in the alveoli, it is unreasonable to conduct an ultrasound method to assess the condition of the pulmonary parenchyma. However, this method provides Uzi-specific opportunities for the lungs. However, in pathologies, for example, pulmonary edema and when the resistance of lung tissue changes, the UTT method is important, therefore, with the help of ultrasound, it is possible to obtain information about the presence of openings for the appearance of the described characteristic structures [6]. The first work on the visualization of lung tissue in pneumonia began fifty years ago Yu.N. Started by the Bogin Scientist [17].

At that time, it was possible to visually check the chest cavity only when the sensors were applied along the standard lines. Ecographic changes in pneumonia have been recorded as heterogeneous foci of edema in lung tissue [7]. In modern conditions, it makes it possible to easily distinguish between tissues and fluid structures, which are shown as "solid shade" during ultrasound and X-ray examination. Ultrasound diagnostics makes it possible to identify the following clinically important issues: the presence of pleural fluid, its quantity, determination of fluid level and topography in relation to the chest wall, the choice of the optimal anotomic point for puncturing pleural fluid; determination of pleural empyema localization, size; detection of pneumonia (localization of the pneumonia site, determination of length, structure; identification of possible complications; ; dynamic control of diseases of the lungs and pleura and assessment of the effectiveness of therapy; conducting differential diagnostics between malignant and benign formations of the lungs and pleura; monitoring the condition of the pleural cavity, the degree of expansion of the lungs, the formation of fibrotorax after surgical interventions in the lungs and pleura, and assessing the effectiveness of surgical treatment [8]. The main method of ultrasound diagnosis of pneumonia is the BLUE protocol. The name consists of an abbreviation of the following words: B – bed mode, L - lung, U - ultrasound, E - shoshilich. In fact, this method was introduced in 2008 by D.In emergency situations proposed by a Liechtenstein; an ultrasound examination of the lungs in the bed mode case is the most convenient option. The purpose of this protocol was diagnostic screening of the causes of acute respiratory failure in patients in rush cases. There is an opportunity to do it in 3 minutes. This allows the identification and differentiation of the following pathological conditions: pneumothorax, pulmonary edema, pulmonary embolism, pneumonia, chronic obstructive pulmonary disease, bronchial asthma [6]. In order to see the pathologically altered lung tissue on ultrasound, it is

necessary to have a clear picture of the normal ultrasound image of the lungs. Doctors of ultrasound diagnostics, anesthesiologist-resuscitator, ambulance doctor, cardiologist have the right to use this method [9.12].

There are three main sensors of the ultrasound method: linear 5-15 MHz up to 10 cm, convex 2-7.5 MHz up to 25 cm. Each of them has a completely different ratio of scan frequency and depth. Convex and sectorial are suitable for viewing deep structures, and linear sensors are suitable for the pleura [13]. Most often, the patient is examined in a supine position (lying on his side, lying on his side). Each lung is divided into three regions (anterior, lateral and posterior), between which it is visible in the parasternal, anterior and posterior axillary and paravertebral lines. Ultrasound sounds appear structures located in the intercostal space. The evaluation begins in each intercostal space from the previous region along the parasternal line from the top to the diaphragm. In the same way, the anterior axils, posterior axils and paravertebral areas are examined. If changes are detected in any intercostal space, then a deeper study is carried out. Thus, this research method replaced auscultation and significantly reduced the risk of infection for the doctor [18]. Peng and other authors conducted a study in 120 patients with COVID-19, describing similar features that manifest themselves in a bilateral and polysegmental way: they cited the appearance of local B-lines as the main early signs, and later, in the advanced process, alveolar interstitial syndrome, and then with the appearance of a-Lines, as a sign of recovery. They noted a rare meeting of pleural fluid. Another preliminary study by Poggiali and others conducted using ultrasound and CT in 12 patients with symptomatic COVID-19 disease. They noted the correlation between B-lines in ultrasound and dim glass in CT. Both methods determined the consolidation of pneumonia in 14 patients. As noted in preliminary clinical observations, in patients with COVID-19, a lung ultrasound scan was able to detect injuries corresponding to computed tomography. Secondly, the nature of the results of ultrasound should be determined, in particular, for several B-lines. If 3 or more B-lines are found in the acoustic window, it is argued that this indicates "interstitial" or "alveolar - interstitial" syndrome. However, if such a picture represents a homogeneous change, this may indicate a cardiogenic nature of the lesion. If we see the heterogeneous nature of the lesion, especially in combination with subpleural consolidation, pleural thickening and decreased lung mobility, it is more compatible with pneumonia and acute respiratory distress syndrome.

In the official report of the British National Health Organization, ultrasound of the lungs is not mentioned among the clinical recommendations for the distribution of patients with coronavirus infection. In this country, X-ray and CT of the lungs are cited as the first diagnostic line in suspected cases [16]. Before clinical symptoms appeared, Chinese experts recommended the use of early chest CT to examine suspicious patients, but the high contagiousness of SARS-CoV-2 and the risk of infection transport of severe patients with hypoxia and hemodynamic insufficiency limited the possibilities of using this method. Despite sufficient study of this method in patients suspected or diagnosed with COVID-19, the use of an ultrasound examination of the lungs was allowed. A comparative study with the participation of 20 patients with COVID-19, conducted using lung ultrasound and CT of the chest organs, showed the peculiarities of syndromology characteristic of CT [15]. Thus, the clinical experience gained in the use of ultrasound of the lungs made it possible to consider it as a very promising and highly informative method that allows you to quickly check for systemic changes.

When assessing the experience of specialists from different countries, the following should be noted. Studies carried out show that the method of ultrasound examination of the lungs has become an important element of the primary diagnosis of lung damage in pneumonia caused by COVID-19: it is affordable, easy to use, moderately informative, helps to reduce the number of increases in the number of sick people. The time of direct contact of medical personnel working in the conditions of COVID 19 panedemia with the patient was reduced to ancha. Of course, more research is needed on the possibilities of using this method in various clinical situations.

LITERATURE

1. Jonibekov J.J., Ismailova M.Kh. Role of computer tomography in diagnostics of coronaviral etiology of pneumonia // Journal of Hunan University（Natural Sciences）Vol. 48. No. 7. July 2021.
2. Jonibekov J.J. The Role of Computed Tomography in Pneumonia in Patients with Associated Coronavirus Infection // Middle european scientific bulletin, volume 13 june 2021
3. Жонибеков Ж.Ж. Мультимодальная лучевая диагностика пневмонии при новой коронавирусной инфекции (covid-19) // Tibbiyotda yangi kun 2 (34) 2021 г
4. Jonibekov J.J., Ismailova M.Kh. Diagnostic capabilities of ultrasound diagnostics of lung changes in the causative agent of coronavirus infection compared to CT // GCCSA-2021- 6th Global Congress on Contemporary Sciences & Advancements Hosted online from Rome, Italy June 5th, 2021
5. Jonibekov J.J., Ismailova M.Kh. X-RAY examination in pneumonia with the association of covid 19 // GCCSA-2021- 6th Global Congress on Contemporary Sciences & Advancements Hosted online from Rome, Italy June 5th, 2021
6. Jonibekov J.J., Ismailova M.Kh. PREVENTIVE MEASURES ANDMODERN THERAPY OF CORONAVIRUS INFECTION // EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE Vol. 2 No. 1 (2022) EJMMP ISSN: 2795-921X
7. Jonibekov J.J., Ismailova M.Kh. Headache and other Neurological Symptoms in the Structure of the New Clinical Picture Corona Virus Infection (Covid-19) // International Journal of Culture and Modernity ISSN 2697-2131, Volume 12
8. Jonibekov J.J. X-RAY EXAMINATION IN PNEUMONIA WITH THE ASSOCIATION OF COVID 19 // GCCSA-2021- 7th Global Congress on Contemporary Sciences & Advancements Hosted online from, New york, USA www.econferenceglobe.com June 25th, 2021
9. Jonibekov J.J. DIAGNOSTIC CAPABILITIES OF ULTRASOUND DIAGNOSTICS OF LUNG CHANGES IN THE CAUSATIVE // GCCSA-2021- 6th Global Congress on Contemporary Sciences & Advancements Hosted online from Rome, Italy online-conferences.com
10. Ismailova M. X, Jonibekov J. J. PREVENTIVE MEASURES ANDMODERN THERAPY OF CORONAVIRUS INFECTION // EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE Vol. 2 No. 1 (2022) ISSN: 2795-921X. P.31-35
11. Ismailova M. X, Jonibekov J. J. Headache and other Neurological Symptoms in the Structure of the New Clinical Picture Corona Virus Infection (Covid-19) // InternationalJournalof Cultureand Modernity ISSN 2697-2131, Volume 12 P.22-32
12. Ruziyev A.E. Justification of the use of the method of lymphatic therapy to improve the results in the complex treatment of ulcerative colitis // International journal on human computing studies. Volume: 02 Issue: 6 November-December 2020. 28-30.
13. Ruziyev A.E. Advantages of the method of lymphotropic therapy in the treatment of ulcer colitis // Novateur Publications JournalNX- A Multidisciplinary Peer Reviewed Journal. Volume 6, ISSUE 6, June -2020. 112-116.
14. Ruziyev A.E. Indirect analysis of the results of conservative and surgical methods of treatment of non-specific ulcerative colitis // European journal of research development and sustainability. Impact Factor: 7.455 Volumes 2, Issue 2 February, 2021. An open access, peer reviewed multidisciplinary journal Scholarzest.com Calle Nelly, 4, 35 Carrizal de Ingenio, Las Palmas, Spain. Page No.:79-82.
15. Рузиев А.Э. Лимфотропная терапия в комплексе лечения язвенного колита // Материалы международной научно-практической конференции на тему “Актуальные вопросы хирургии толстой кишки”. –Андижан, 2021. -С.67-70.

16. Рузиев А.Э. Электронная программа, изучающая развитие неспецифического язвенного колита в зависимости от состояния лимфатической системы // Свидетельство зарегистрировано в государственном реестре программ для ЭВМ от 21.12.2020, №DGU 2020 2230.
17. Рузиев А.Э., Эгамов Ю.С. Комплексная терапия неспецифического язвенного колита в послеоперационном периоде // Методические рекомендации. - Ташкент, 2020. - 22 с.
18. Рузиев А.Э., Эгамов Ю.С. Способ лимфатической терапии неспецифического язвенного колита // Методические рекомендации. - Ташкент, 2020. - 23 с.