



EFFECT OF COVID-19 INFECTION ON CARDIOVASCULAR DISEASE

Abdushukurova Komila Rustamovna

Senior Lecturer, Department of Internal Medicine No.1, Samarkand State Medical University, Samarkand, Uzbekistan.

Mail: kamilaterapevt1983@gmail.com

ORCID: 0000-0002-9555-8095

Abdullaeva Guzal Maksudovna

student of Samarkand State Medical University, Samarkand, Uzbekistan.

Article history:

Received: March 11th 2024
Accepted: April 10th 2024

Abstract:

The coronavirus pandemic has had a drastic negative impact on global health indicators. To date, about 62 million cases of coronavirus infection have been identified around the world. According to WHO data, complications of the coronavirus disease with cardiovascular system diseases vary from 2.9% to 35.2% in different regions of the world. According to statistics, when complicated with cardiovascular diseases, 23.7% of patients with COVID-19 become seriously ill, and 10.7% of patients die. Patients suffering from coronavirus disease have a high risk of developing myocardial infarction on the 2-7th day of the disease, and it has been found that many patients do not have clinical symptoms characteristic of infarction.

When studying 40 patients treated in September and October 2022 in the Therapy Department of the 1st clinic of Samarkand State Medical University, 2 patients with a background of coronavirus and 7 patients with myocardial infarction after a coronavirus disease were recorded. The specificity of the clinical course of coronavirus-associated myocardial infarction has not been studied in the territory of Uzbekistan and is of great scientific and practical importance.

Keywords: coronavirus, myocardial infarction, angiotensin-converting enzyme inhibitor, post-infarction atherosclerosis, coronary artery, heart failure (YY).

Coronavirus infection was first identified in the Chinese province of Wuhan, Hubei province. The World Health Organization (WHO) officially declared the SARS-CoV-2 epidemic an emergency of international concern on January 30, 2020, and a global pandemic on March 11, 2020. WHO called on countries to implement measures to prevent the spread of the virus and protect public health, introducing strict social distancing and quarantine [1].

Despite international efforts, SARS-CoV-2 has spread to 213 countries, resulting in more than 5 million cases and nearly 400,000 deaths since its official identification in Wuhan, China, in December 2019 [2]. As of November 7, 2022, 244,739 cases of coronavirus disease and 1,637 deaths (0.7%) were registered in Uzbekistan [3]. The disease caused by the new coronavirus infection has been named by WHO as "Covid-19" ("Coronavirus disease, 2019"). This name was chosen to avoid confusion regarding the origin,

population, geography, and association of the disease with animals.

On February 11, 2020, the International Committee for the Study of the Coronavirus announced the official name for the new virus: severe acute respiratory syndrome coronavirus (SARS-CoV-2). Nevertheless, in many cases, the acronym COVID-19 is used [WHO, 2020]. Reports have detailed various cardiac pathologies associated with COVID-19, including heart failure, myocarditis, and acute coronary syndrome [4]. It is hypothesized that COVID-19 may cause myocardial injury through several pathways, including direct infection-induced damage to myocardial cells and blood vessels, inflammation, thromboembolism, and virus-associated cytokine release. situations [5].

For the first time, in 1965, human coronavirus infection (HCoV) was detected in embryonic tracheal tissue culture, and until 2002, the virus was considered not to be highly pathogenic. These views changed in 2002 after the spread of the infection in the form of atypical



pneumonia in China. After 10 years, Middle East Respiratory Syndrome (MERS) was detected in Saudi Arabia [6]. Although the above outbreaks were caused by different strains of the virus (SARS-CoV and MERS-CoV, respectively), both viruses that caused the pandemic belong to the β -coronavirus group [7]. SARS-CoV and MERS-CoV viruses were first identified in bats, and currently these creatures are considered the natural reservoir of the pathogen. All over the world, organisms genetically similar to the SARS-CoV and MERS-CoV viruses detected in bats have been identified [8].

Men over 65 years of age are at risk of contracting the virus. Smoking is also one of the important risk factors (XO) [9]. A multicenter study was conducted in order to dynamically evaluate the health and psychosomatic condition of patients with chronic non-infectious diseases (NCDs) during the quarantine/isolation period. According to the results, physical activity decreased in 38% of patients in quarantine and isolation, and on the contrary, increased physical activity was observed in 13%. An increase in food intake was observed in 40% of patients, and this led to an increase in body mass and body mass index of up to 15%. Before the pandemic, 33% of patients consumed alcohol, and after the pandemic, this figure increased to 3%. In the pre-pandemic period, 12% of patients smoked, and during the quarantine period, this indicator increased by 1.5 times. During isolation, 53% of patients suffered from mild stress, 40% from moderate stress, and 6.5% from severe stress. 46% of patients with SNIK suffered from mild anxiety/depression, while 5.4% of patients had severe anxiety/depression. Among SNIK, hypertensive disease was common (in 67% of patients), hypertensive crisis was observed in 22% of patients during the quarantine period, and the dose of antihypertensive drugs was required to be increased in 19% of patients. The 2nd place in terms of frequency is I III functional class angina pectoris (32%), only in 2% of cases was the worsening of the patient's condition [10]. Patients with cardiovascular or cardiovascular risk factors (older age, male gender, AG, QD, obesity) along with coronavirus disease are characterized by a severe course of COVID-19 and high hospital lethality [11].

According to these available data, the frequency of cardiovascular diseases (CVD) in hospitalized patients with COVID-19 is high, and the level of risk is even higher in them. Arterial hypertension (AG) is a common comorbidity in patients with CKD hospitalized with COVID-19. In this case, it was determined that the result of the assessment also depends on the region where the research was conducted and the age of the patients [12]. When the results of 31 studies involving

77,314 patients suffering from COVID-19 were meta-analyzed, it was found that the presence of CKD in the patient's anamnesis is a predictor of high risk of CKD complications and cardiovascular complications (CVD) [13]. At the same time, during the inpatient treatment of patients with coronavirus, the occurrence of SEVERE was observed in an average of 14% of patients, and this condition is also a predictor of a lethal outcome. In addition, YUQTA can be monitored even after the patient is discharged from the hospital. In a study of 47,780 patients with coronavirus, analyzed a median of 140 days after hospital discharge, major CHD (heart failure, myocardial infarction (MI), stroke, and cardiac arrhythmias) compared with a control group it was found to be 3 times more frequent in comparison [14]. The ARIC prospective cohort observational study showed that approximately 90 days after myocardial infarction, patients have an increased risk of developing CVD and stroke [15].

A high concentration of D-dimer in the blood, which is a marker of activation of the blood clotting system, is also associated with a high risk of bleeding. Taking into account the role of thrombosis in the pathogenesis of COVID-19, we can understand the importance of D-dimer in determining the severity of COVID-19 [16]. In addition to elevated D-dimer levels, blood levels of cardiac troponin (which correlates well with levels of S-reactive protein (SRO), a marker of inflammation) and brain natriuretic peptide (N-N) are important predictors of COVID-19 severity and prognosis. fragment (NT-proBNP) (determining the degree of myocardial damage - correlated with the level of cardiac troponin) is also important [17]. According to the data, the course and complications of the coronavirus disease are relatively more severe in patients with CKD. In a retrospective analysis of data from 99 patients with coronavirus disease, pneumonia, and known outcomes in the first 14 days after hospitalization, 55 patients with HF (chronic heart failure (CHF)) in inpatients in the city of Brescia, Northern Italy, Creatinine, NT proBNP, cardiac troponin, and procalcitonin levels were found to be high in patients with atrial fibrillation (AF) or AF. It is known from the anamnesis of these patients that they received renin angiotensin-aldosterone system (RAAT) blockers, anticoagulants and statins.

According to the results of the study, the incidence of lethality and septic shock was higher in patients with CKD (36% and 15%, $r=0.02$ and 11% vs. 0, $r=0.02$, respectively), and acute the tendency to respiratory distress syndrome, venous and arterial thrombosis was determined. In combination with the age factor, it was found that the mortality rate was reliably higher in patients with SYY, YIK, QD, SBK and high NTproBNP



index [18]. In a retrospective study of 671 patients hospitalized with severe COVID-19 at a university clinic in Wuhan, China, higher cardiac troponin was associated with older patient age, higher AG, YIK, SYY, and ECHT. was determined [19]. It was found that high troponin level, as well as high values of MV fraction of creatine phosphokinase and NTproBNP, are also independent predictors of in-hospital mortality. In addition, according to the results of the multifactorial regression analysis, YIK and SYY are predictors of the outcome of death. In 5257 patients with acute hypoxemic respiratory failure examined in New York City, it was found that the presence of independent predictors of death in hospital conditions was age, IHC and SYY [20].

All of the above indicators indicate a more severe course of the disease, myocardial damage, dysfunction, and several reasons can be given for this:

- a) damage to the cardiovascular system caused by COVID-19;
- b) treatment modification due to the development of COVID-19;
- c) Cardiotoxic effects of drugs used for the prevention and treatment of COVID-19;
- d) insufficient resources of the health system to provide drugs used in the treatment of cardiovascular disease due to the increase in the number of cases of COVID-19;
- e) due to continuous stress as a result of being kept in quarantine for a long time during the COVID-19 pandemic, failure to contact a medical facility in time due to the risk of contracting the coronavirus disease;
- f) Increased frequency of sudden death in the pre-hospitalization phase [21].

It is noted that when diseases of the cardiovascular system are accompanied by high levels of cardiac troponin, the probability of a bad prognosis is high.

N.S. Hendren et al introduced a new concept to describe the cardiological manifestations of COVID-19: acute COVID-19-associated cardiovascular syndrome. This concept includes cardiovascular and thromboembolic complications that may occur under the influence of coronavirus infection [22]. Acute covid-19 associated cardiovascular syndrome arrhythmias (ventricular fibrillation, ventricular tachycardia and ventricular fibrillation), acute myocardial injury, fulminant myocarditis (important in the development of heart failure), pericarditis, cardiac tamponade, acute coronary Arterial and venous thrombotic disorders, stroke, pulmonary embolism (PET), deep vein thrombosis, manifested in the form of syndrome (OCS). It was found that during the KVI pandemic, the number of in-hospital deaths in patients with ST segment

elevation myocardial infarction increased [23]. It was also found that the combination of YY and YIK increases the risk of death in hospitalized patients with CVI [24].

LIST OF REFERENCES USED

1. World Health Organization. 2020. WHO Announces COVID-19 Outbreak a Pandemic.
2. Hiscott J, Alexandridi M, Muscolini M, Tassone E, Palermo E, Soultioti M, Zevini A. The global impact of the coronavirus pandemic. *Cytokine Growth Factor Rev.* 2020 Jun; 53:1-9. doi: 10.1016/j.cytogfr.2020.05.010. Epub 2020 May 28. PMID: 32487439; PMCID: PMC7254014.
3. <https://www.worldometers.info/coronavirus/country/uzbekistan/>
4. Escher F, Pietsch H, Aleshcheva G, et al Detection of viral SARS-CoV-2 genomes and histopathological changes in endomyocardial biopsies. *ESC Heart Fail* 2020;7: 24407. doi:10.1002/ehf2.12805 pmid: <http://www.ncbi.nlm.nih.gov/pubmed/32529795> PubMed Google Scholar.
5. Shi S, Qin M, Shen B, et al Association of cardiac injury with mortality in hospitalized patients with COVID-19 in Wuhan, China. *JAMA Cardiol* 2020;5:8020. doi:10.1001/jamacardio.2020.0950 pmid: <http://www.ncbi.nlm.nih.gov/pubmed/32211816> PubMedGoogle Scholar
6. To K-W, Hung IF-N, Ip JD, Chu AW-H, Chan WM, Tam AR, et al. COVID19 re-infection by a phylogenetically distinct SARS-coronavirus-2 strain confirmed by whole genome sequencing. *Clin infect dis.* 2020; Aug 25; ciaa1275. PMID: 32840608 <https://doi.org/10.1093/cid/ciaa1275> Online ahead of print.
7. Corman VM, Lienau J, Witzenzrath M. Coronaviruses as the cause of respiratory infections. *Der Internist.* 2019;60(11):1136–1145. <https://doi.org/10.1007/s00108-019-00671-5>
8. Petrikov S.S., Ivannikov A.A., Vasilchenko M.K., Esaulenko A.N., Alidzhanova K.G. COVID-19 and Cardiovascular System: Pathophysiology, Pathomorphology, Complications, Long-Term Prognosis. *Russian Sklifosovsky Journal "Emergency Medical Care"*. 2021;10(1):14-26. <https://doi.org/10.23934/2223-9022-2021-10-1-14-26>
9. Williamson E, Walker AJ, Bhaskaran K, et al.; The OpenSAFELY Collaborative. OpenSAFELY: factors associated with COVID19-related hospital death in the linked electronic health records of 17 million adult NHS patients. doi:10.1101/2020.05.06.20092999
10. Мамедов М. Н., Родионова Ю. и соавт. Коронавирусная инфекция с точки зрения междисциплинарного подхода. Круглый стол



Кардиоваскулярная терапия и профилактика 2021;20(3):2849.

11. Абдушукурова К. Р., Нусратова Ш. Ф. ГЕРИАТРИЧЕСКИЕ ОСОБЕННОСТИ РЕВМАТОИДНОГО АРТРИТА //Евразийский журнал медицинских и естественных наук. – 2024. – Т. 4. – №. 4. – С. 156-163.

12. В. Н. Ларина, М. Г. Головки, В. Г. Ларин Влияние коронавирусной инфекции (сovid-19) на сердечно-сосудистую систему, ОБЗОР ВИРУСОЛОГИЯ-2020, DOI: 10.24075/vrgtmu.2020.020

13. Абдушукурова К., Шоимова О. ИММУНОПАТОГЕНЕТИЧЕСКИЕ ОСНОВЫ РЕВМАТОИДНОГО АРТРИТА: ОБЗОР ЛИТЕРАТУРЫ //Евразийский журнал медицинских и естественных наук. – 2024. – Т. 4. – №. 4. – С. 58-70.

14. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. *Lancet* 2020;395(10223):470–473. pmid:31986257

15. Sabatino J, De Rosa S, Di Salvo G, Indolfi C. Impact of cardiovascular risk profile on COVID-19 outcome. A metaanalysis. *PLoS ONE*. 2020;15(8):e0237131. doi:10.1371/journal.pone.0237131

16. Абдушукурова К. Р., Хамраева Н. А. Особенности Лечения Параклинических Проявлений Ревматоидного Артрит //Central Asian Journal of Medical and Natural Science. – 2023. – Т. 4. – №. 6. – С. 256-262.

17. Абдушукурова К. ДИАГНОСТИКА ОСТЕОПОРОЗА ПРИ РЕВМАТОИДНОМ АРТРИТЕ //Журнал вестник врача. – 2020. – Т. 1. – №. 1. – С. 9-11.

18. Guo T, Fan Y, Chen M, et al. Cardiovascular Implications of Fatal Outcomes of Patients With Coronavirus Disease 2019 (COVID-19). *JAMA Cardiol*. 2020;5(7):811-8. doi:10.1001/jamacardio.2020.1017.

19. Guan W.J., Ni Z.Y., Hu Y., Liang W., Ou Ch., He J. et al. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med*. 2020; 2020 Feb 28. doi: 10.1056/NEJMoa2002032

20. Абдушукурова К., Исламова К. ВЗАИМОСВЯЗЬ НЕРВНО-ЭНДОКРИННЫХ НАРУШЕНИЙ У БОЛЬНЫХ РЕВМАТОИДНЫМ АРТРИТОМ //International Bulletin of Medical Sciences and Clinical Research. – 2023. – Т. 3. – №. 11. – С. 16-20.

21. Исламова К. А. и др. ЭФФЕКТИВНОСТЬ ВНУТРИСУСТАВНОГО ВВЕДЕНИЯ ГИАЛУРОМ ХОНДРО ПРИ РАННЕМ ОСТЕОАРТРОЗЕ //IQRO. – 2023. – Т. 2. – №. 2. – С. 186-193.

22. Явелов Игорь Семенович Covid-19 и сердечно-сосудистые заболевания // Международный журнал сердца и сосудистых заболеваний. 2020. №27.

23. Amrillaevich A. I., Rustamovna A. K. REVMATOID ARTRIT VA YURAK ISHEMIK KASALLIGI BO 'LGAN BEMORLARDA ASPIRIN QO 'LLANILISHI //Journal of cardiorespiratory research. – 2020. – Т. 1. – №. 3. – С. 49-51.

24. Arentz M, Yim E, Klaff L, Lokhandwala S, Riedo FX, Chong M, Lee M.. Characteristics and outcomes of 21 critically ill patients with COVID-19 in Washington State. *JAMA* 2020;doi: 10.1001/jama.2020. - PMC - PubMed

25. Абдушукурова К. Р. и др. Сустановой Синдром При Хронических Воспалительных И Дистрофических Заболеваниях Суставов //Miasto Przyszłości. – 2023. – Т. 33. – С. 209-214.

26. Amrillaevich A. I., Rustamovna A. K. REVMATOID ARTRIT VA YURAK ISHEMIK KASALLIGI BO 'LGAN BEMORLARDA ASPIRIN QO 'LLANILISHI //Journal of cardiorespiratory research. – 2020. – Т. 1. – №. 3. – С. 49-51.

27. Inciardi R.M., Adamo M., Lupi L. et al. Characteristics and outcomes of patients hospitalized for COVID-19 and cardiac disease in Northern Italy. *Eur. Heart J*. 2020; 41 (19): 1821– 1829. DOI: 10.1093/eurheartj/ehaa388.

28. Hendren N.S., Drazner M.H., Bozkurt B., Cooper L.T. Description and proposed management of the acute COVID-19 cardiovascular syndrome. *Circulation*. 2020; 141 (23): 1903–1914. DOI: 10.1161/CIRCULATIONAHA.120.047349.

29. Абдушукурова, К. Р., & Хамраева, Н. А. (2023). РЕВМАТОИД АРТРИТ КАСАЛЛИГИДА АРТЕРИАЛ ГИПЕРТЕНЗИЯ ФЕНОТИПЛАРИНИНГ СУТКАЛИК БУЗИЛИШЛАРИ. " XALQ TABOVATI VA ZAMONAVIY TIBBIYOT, YANGI YONDASHUVLAR VA DOLZARB TADQIQOTLAR", 8, 1-5.

30. Абдушукурова К. Р., Эргашова М. М. ЭКГ ИЗМЕНЕНИЯ У БОЛЬНЫХ ПРИ РЕВМАТОИДНОМ АРТРИТЕ С АНЕМИЕЙ //Молодежь и медицинская наука в XXI веке. – 2014. – С. 160-161.

31. Абдушукурова, К. (2020). ПРИМЕНЕНИЕ АСПИРИНА У БОЛЬНЫХ РЕВМАТОИДНЫМ АРТРИТОМ В СОЧЕТАНИИ С ИШЕМИЧЕСКОЙ БОЛЕЗНЬЮ СЕРДЦА. *Журнал кардиореспираторных исследований*, 1(3), 49-51.

32. Абдушукурова, К. Р., & Ташинова, Л. Х. (2019). Лечение параклинических проявлений ревматоидного артрита. In *Актуальные вопросы современной медицинской науки и здравоохранения: сборник статей IV Международной научно-практической конференции молодых учёных и студентов, IV Всероссийского форума медицинских и фармацевтических вузов «За качественное образование»*, (Екатеринбург, 10-12 апреля 2019): в 3-х т.-Екатеринбург: УГМУ, CD-ROM..



World Bulletin of Public Health (WBPH)

Available Online at: <https://www.scholarexpress.net>

Volume-34, May 2024

ISSN: 2749-3644

Федеральное государственное бюджетное образовательное учреждение высшего образования «Уральский государственный медицинский университет» Министерства здравоохранения Российской Федерации.