Letter to Editor
Eurasian Journal of Critical Care

Complications of SARS-CoV-2 Infection in Geriatrics

Abuzer Ozkan[1], Ibrahim Altunok[1]
[1] Department of Emergency Medicine, University of Health Sciences Umraniye Training and Research Hospital, Istanbul, Turkey

Dear editor,

SARS-CoV-2 was declared a pandemic by the World Health Organization on March 11, 2020, when the first case was seen in Turkey. Since this date, there have been significant changes in the organization of the health system and the health behavior of the society (1). Particularly, the compliance of the elderly from risky groups to vaccination and pandemic measures has been at a high level. Advanced age has been reported as an important risk factor for mortality and poor outcome in SARS-CoV-2 infected patients in the literature (2). In various studies, it has been reported that the symptoms of SARS-CoV-2 infection, especially fever, can be masked in elderly patients, and patients can apply with atypical signs and symptoms (3). This may cause delay in the diagnosis process and the spread of nosocomial disease. SARS-CoV-2 infection generally progresses with a mild clinical picture in people who are not of advanced age and do not have comorbid diseases. However, elderly patients and patients with comorbid diseases have a high risk of progressing with a moderate or severe clinical picture, and these people usually need to be hospitalized in the hospital for diagnosis and treatment processes. Studies have shown that in vitro activities of antiviral drugs such as chloroquine, favipravir and remdesivir, that have been used since the beginning of the pandemic are not as successful as predicted in preventing hospitalizations, intensive care admissions or mortality. Therefore, specific antiviral treatments for SARS-CoV-2, continue to be investigated (4). The data obtained in the treatment of SARS-CoV-2 infection support the importance of the supportive treatments applied and that it is the main treatment approach. Especially in the elderly or those with comorbid diseases, the importance of supportive treatments in the management of clinical conditions and complications increases and has positive effects on survival rates (5).

Many studies show that SARS-CoV-2 infection can progress with complications and mortality rates increase in elderly people and those with comorbid diseases (6,7). Complications in advanced patients were investigated in a study in the literature. In the study of Ramos-Rincon et al., the most common complication was ARDS (43%), followed by acute renal failure (24.6%). Other complications were reported as pneumonia (14.2%), acute heart failure (13.9%), multi-organ failure (10.8%) and sepsis (9.3%). Less common complications were reported as arrhythmia, acute coronary syndrome, venous thromboembolism, myocarditis, intravascular coagulation, seizure, and stroke. Ramos-Rincon et al. reported ARDS and multi-organ failure as cardinal causes regarding mortality and poor outcome in geriatric SARS-CoV-2 infected patients (7). In another study conducted by Zerah et al, it was shown that pulmonary and systemic inflammation findings resulting in multi-organ failure occur more frequently in elderly people infected with SARS-CoV-2 and increase mortality rates (8). The most important complications in this study were ARDS, acute kidney injury, delirium, heart failure, liver dysfunction and lymphopenia. Thrombotic diseases affecting both arterial and venous circulation are reported to develop more frequently in elderly patients with SARS-CoV-2 infection. Zerah et al. reported a higher incidence of advanced inflammation, platelet activation, endothelial dysfunction, stasis, and thrombotic events in older patients as a plausible explanation for complications (8). On the other hand, it was reported that age was not a risk factor for long-term effects in a study in which the six-month effects of SARS-CoV-2 infection were investigated (9).

Infections initiate a complex systemic inflammatory response as part of innate immunity. It activates coagulation following activation of host defense systems. In sepsis, this complex interaction of immune response and coagulation is called thrombo-inflammation or immune-thrombosis. Polyphosphates originating from microorganisms, mast cells, complement system, neutrophil extracellular traps (neutrophil extracellular traps), free DNA, histones are

Corresponding Author: Abuzer Ozkan **e-mail:** abuzerozkan@gmail.com
Received: 07.08.2022 • **Revision:** 16.08.2022 • **Accepted:** 18.08.2022
DOI: 10.55994/ejcc.1158838

Cite this article as: Ozkan A. Altunok I. Complications of SARS-CoV-2 Infection in Geriatrics. Eurasian Journal of Critical Care. 2022;4(3): 114-115

the main components that affect thrombin formation in sepsis. Cytokines that emerge in the inflammatory process also activate vascular endothelial cells and create a prothrombotic state by creating endothelial damage. In addition, the fibrinolytic system is also affected, for example PAI-1 activity increases (10). Since it was determined that a different picture developed in SARS-CoV-2 infection from DIC or sepsis-related DIC, this picture was started to be named as SARS-CoV-2 infection-associated coagulopathy. Coagulopathy seems to be related to the severity of the disease, its pathogenesis is not yet known, but it is thought to occur as a result of a "thrombo-inflammation" picture as described above. Its main features can be listed as follows: Coagulopathy becomes evident with an increase in D-dimer and fibrinogen levels, minimal changes in prothrombin time, activated partial thromboplastin time, and platelet count (11). High D-dimer level at admission is associated with increased mortality (10). The continuation of the D-dimer increase after hospitalization is a harbinger of multiorgan failure and the development of overt DIC. In patients who died, the increase is evident from the 4th day of hospitalization. Bleeding findings are not common despite coagulopathy. geriatric patients are at increased risk for thrombo-inflammation (11).

In conclusion, although the mortality rate of SARS-CoV-2 infection has decreased with new variants, age is still among the most known risk factors. Clinicians should be alert for complications in the management of SARS-CoV-2 infected geriatric patients.

References

1. Özdemir S, Algın A. How will the Health Literacy and Crowded Emergency Room Be Affected After the COVID-19 Pandemic? Phnx Med J. 2021; 3(1): 50.
2. Bonanad C, García-Blas S, Tarazona-Santabalbina F, Sanchis J, Bertomeu-González V, Fácila L, et al. The Effect of Age on Mortality in Patients With COVID-19: A Meta-Analysis With 611,583 Subjects. J Am Med Dir Assoc. 2020 Jul;21(7):915-918.
3. Özdemir S, Akça H, Altunok İ, Algın A, Özkan A, Pala E, et al. Evaluation of the Relationship between Symptoms and Poor Prognosis on Patients Admitted to COVID-19 Outpatient Clinic: Retrospective Cohort Study. Anatolian J Emerg Med. 2021; 4(1): 1-5.
4. Akin L, Gözel MG. Understanding dynamics of pandemics. Turk J Med Sci. 2020 Apr 21;50(SI-1):515-519.
5. Özdemir S, Eroğlu SE, Algın A, Akca HS, Ozkan A, Pala E, et al. Analysis of laboratory parameters in patients with COVID-19: Experiences from a pandemic hospital. Ann Clin Anal Med. 2021;12 (Supp 4):518-23.
6. Akça HŞ, Algın A, Özdemir S, Sevimli H, Kokulu K, Eroğlu SE. Comparison of the efficacy of PSI, CURB-65, CALL and BCRSS in predicting prognosis and mortality in COVID-19 patients. J Exp Clin Med. 2021;38(4):434-9
7. Ramos-Rincon JM, Buonaiuto V, Ricci M, Martín-Carmona J, Paredes-Ruíz D, Calderón-Moreno M, et al; SEMI-COVID-19 Network. Clinical Characteristics and Risk Factors for Mortality in Very Old Patients Hospitalized With COVID-19 in Spain. J Gerontol A Biol Sci Med Sci. 2021 Feb 25;76(3):e28-e37.
8. Zerah L, Baudouin É, Pépin M, Mary M, Krypciak S, Bianco C, et al. Clinical Characteristics and Outcomes of 821 Older Patients With SARS-Cov-2 Infection Admitted to Acute Care Geriatric Wards. J Gerontol A Biol Sci Med Sci. 2021 Feb 25;76(3):e4-e12.
9. Eroglu SE, Ademoglu E, Baslilar S, Aksel G, Eker A, Algın A, et al. Can 1st and 6th month pulmonary function test follow-ups give an idea about the long-term respiratory effects of COVID-19 pneumonia? Rev Assoc Med Bras (1992). 2022 Feb;68(2):183-190.
10. Ranucci M, Ballotta A, Di Dedda U, Bayshnikova E, Dei Poli M, Resta M, et al. The procoagulant pattern of patients with COVID-19 acute respiratory distress syndrome. J Thromb Haemost 2020 Apr 17. doi: 10.1111/jth.14854.
11. Unuvar A. COVID-19 and Coagulopathy. Sağlık Bilimlerinde İleri Araştırmalar Dergisi 2020; 3(Suppl.1): S53-S62. https://doi.org/10.26650/JARHS2020-S1-0007