Volume 4, Issue 5, May 2026 ISSN (E): 2938-3765

ASSESSMENT OF 6-MONTH CLINICAL OUTCOMES AND RESIDUAL RISK AFTER MYOCARDIAL INFARCTION IN ELDERLY PATIENTS WITH PRIOR COVID-19 INFECTION

Muminov Solikhon Dzhalilovich
Center for Professional Development of Medical Workers of the Republic of Uzbekistan, Tashkent, Uzbekistan

Abstract
The COVID-19 pandemic is increasingly recognized not only as a respiratory infection but also as a condition associated with long-term cardiovascular complications. In elderly patients, previous COVID-19 infection may enhance inflammatory and thrombotic processes, thereby increasing residual cardiovascular risk after myocardial infarction. The aim of this study was to evaluate 6-month clinical outcomes and residual risk after myocardial infarction in elderly patients with prior COVID-19 infection. The study included 105 elderly patients hospitalized with myocardial infarction in the post-COVID period at the Namangan regional branch of the Scientific and Practical Cardiology Center. Clinical examination, electrocardiography, Holter monitoring, echocardiography, laboratory tests, and coronary angiography were used for assessment. Patients were followed for six months, and mortality, rehospitalizations, recurrent myocardial infarction, arrhythmias, progression of chronic heart failure, and coronary revascularization were recorded. During follow-up, overall survival was 96.7%, while mortality reached 3.3%. Rehospitalizations occurred in 24.1% of patients, recurrent myocardial infarction in 5.2%, clinically significant arrhythmias in 20.7%, and progression of chronic heart failure in 17.2%. MACE-free survival was 75.9%, indicating persistent residual cardiovascular risk. These findings suggest that elderly patients with myocardial infarction after COVID-19 infection require careful outpatient monitoring and individualized secondary prevention.

Keywords: Myocardial infarction, COVID-19, elderly patients, residual cardiovascular risk, MACE, chronic heart failure.

Introduction

Relevance of the problem

The COVID-19 pandemic is currently considered not only as an acute respiratory infection but also as a factor with long-term effects on the cardiovascular system. According to scientific evidence, COVID-19 enhances inflammatory responses, endothelial dysfunction, and hypercoagulability, thereby increasing the risk of myocardial infarction [1,2]. In addition, it has been reported that cardiovascular complications in the post-infection period, including thrombotic events and heart failure, may persist for a long time [3]. Myocardial infarction itself leads to myocardial remodeling, neurohumoral activation, and the development of chronic heart failure [4,5]. Particularly in elderly

Licensed under a Creative Commons Attribution 4.0 International License.

patients, residual cardiovascular risk remains high due to the presence of comorbidities, reduced endothelial function, and a predisposition to cardiac rhythm disorders.

In patients who experienced COVID-19 infection and myocardial infarction simultaneously or within a short interval, inflammatory and thrombotic mechanisms may potentiate each other. This condition may lead to an increased incidence of recurrent ischemic events, progression of chronic heart failure, clinically significant arrhythmias, and repeated hospitalizations. However, the issues of 6-month residual risk, MACE-free survival, and clinical stability in elderly patients who suffered myocardial infarction during the post-COVID period remain insufficiently studied. Therefore, evaluating 6-month clinical outcomes after myocardial infarction in elderly patients with prior COVID-19 infection, determining residual cardiovascular risk, and identifying high-risk groups are of significant scientific and practical importance.

Aim of the study

To comprehensively evaluate 6-month clinical outcomes after myocardial infarction in elderly patients with prior COVID-19 infection, including residual cardiovascular risk, MACE incidence, frequency of rehospitalizations, and the dynamics of chronic heart failure; as well as to identify high-risk patient groups and improve effective secondary prevention strategies at the outpatient stage.

Research Materials and Methods

The research was conducted at the Namangan regional branch of the Scientific and Practical Cardiology Center. A total of 105 elderly patients hospitalized with a diagnosis of myocardial infarction in the post-COVID period were selected for the study (39 (37%) women and 66 (63%) men).Inclusion of patients according to age criteria was performed based on the WHO age classification (2016). According to this classification young age 18–44 years, middle age 45–59 years, elderly 60–74 years, old age 75–90 years, and long-livers over 90 years. To assess 6-month clinical outcomes and residual risk after myocardial infarction in elderly patients with prior COVID-19 infection the following examination methods were used. Clinical assessment included collection of medical history, identification of comorbid conditions and evaluation of functional status according to the NYHA classification. Electrocardiography (ECG) was performed to detect ischemic changes and rhythm disturbances. Holter monitoring was used to record clinically significant arrhythmias. Echocardiography was applied to evaluate left ventricular ejection fraction (LVEF), chamber geometry and signs of myocardial remodeling. Laboratory investigations included troponin, C-reactive protein (CRP), lipid profile, creatinine and coagulation parameters including D-dimer. Coronary angiography was performed when indicated in order to detect hemodynamically significant stenoses and determine the need for revascularization. A 6-month dynamic follow-up was carried out during which rehospitalization, recurrent myocardial infarction, clinically significant arrhythmias and revascularization events were recorded. Statistical analysis was performed with results expressed as n and %, while overall survival and MACE-free survival were evaluated using the Kaplan–Meier method.

Licensed under a Creative Commons Attribution 4.0 International License.

Volume 4, Issue 5, May 2026 ISSN (E): 2938-3765

Results

A total of 60 patients who had experienced myocardial infarction and COVID-19 infection were included in the 6-month dynamic follow-up. During the observation period 2 patients (3.3%) died, and by the end of the 6-month follow-up 58 patients (96.7%) remained alive. Further analysis was therefore carried out based on this group of patients (Table 1). The deaths recorded during the follow-up period were associated with clinically justified causes. In one patient the cause of death was cardiogenic shock that developed as a result of recurrent myocardial infarction. In another patient death occurred due to severe decompensated chronic heart failure accompanied by progressive rhythm disturbances.

Table 1 Clinical events during the 6-month follow-up (n = 60)

No	Clinical event	Number of patients (n)	Percentage (%)
1	Death	2	3.3%
2	Surviving patients	58	96.7%
3	Rehospitalization	14	24.1%
4	Recurrent myocardial infarction	3	5.2%
5	Clinically significant arrhythmias (total)	12	20.7%
5.1	Atrial fibrillation	7	12.1%
5.2	Sinus tachycardia	3	5.2%
5.3	Ventricular extrasystole	2	3.4%
6	Progression of chronic heart failure	10	17.2%
7	Percutaneous coronary intervention (PCI)	4	6.9%
8	Coronary artery bypass grafting (CABG)	–	–

These conditions, as emphasized in the literature, are among the main factors determining the mid-term prognosis in patients who have experienced myocardial infarction and COVID-19 infection simultaneously. During the 6-month follow-up period, 14 of the 58 surviving patients (24.1%) were rehospitalized due to various clinical causes. The most common reason for rehospitalization was exacerbation of chronic heart failure, which was observed in 8 patients. In addition, 4 patients required inpatient treatment due to recurrent ischemic complaints, including persistence or worsening of anginal syndrome. In 2 patients, rehospitalization was associated with the development of clinically significant arrhythmias. Analysis of the dynamics of chronic heart failure showed that during the 6-month follow-up, 10 patients (17.2%) experienced progression of chronic heart failure. In particular, in 7 patients the NYHA functional class increased from class II to class III, while in 3 patients it progressed from class III to class IV. In these patients there was a need to intensify diuretic therapy and to reconsider the doses of neurohumoral blocking agents.

Due to deterioration of the clinical condition and persistence of ischemic symptoms, 6 patients (10.3%) required coronary revascularization. Among them, 4 patients underwent percutaneous coronary intervention with coronary stent implantation, while 2 patients underwent coronary artery bypass grafting (CABG) due to multivessel coronary artery disease. These events were considered clinically significant outcomes and were included in the MACE composite endpoint.Thus, the results of the 6-month follow-up demonstrated that in patients who had experienced myocardial infarction and COVID-19 infection, rehospitalizations, progression of chronic heart failure, the need for

Licensed under a Creative Commons Attribution 4.0 International License.

interventional procedures, and mortality accounted for a certain proportion of clinical outcomes. The obtained data support the need to consider these patients as a high-risk group and to strengthen outpatient follow-up and secondary prevention strategies in this patient population.

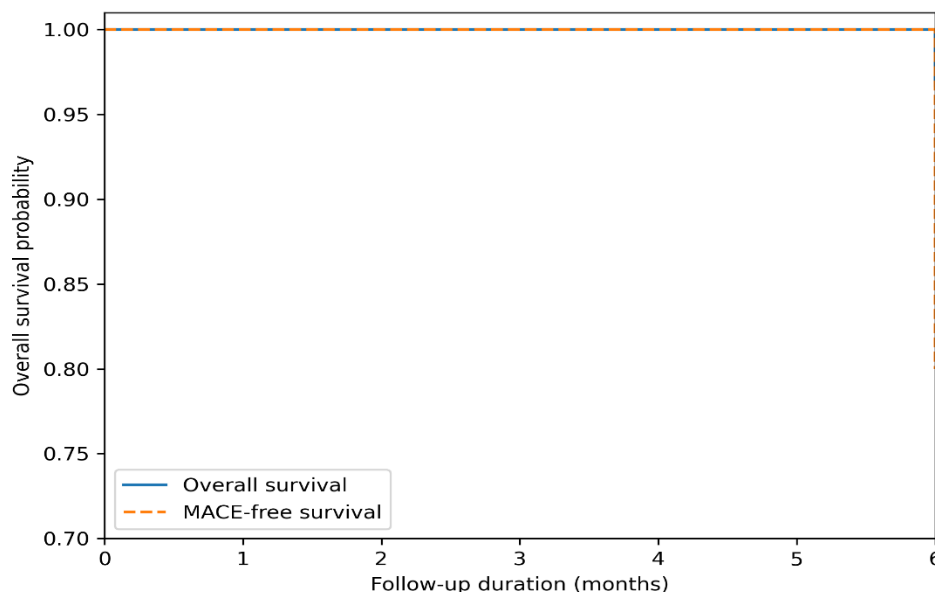

Figure 1. Survival rates during the 6-month follow-up

When analyzing the results of the 6-month follow-up in patients who experienced myocardial infarction and COVID-19 infection simultaneously, it is important to evaluate survival not only from a biological perspective but also in relation to clinically significant complications. For this purpose, in the present study, in addition to overall survival, MACE-free survival was also analyzed using the Kaplan–Meier method (Figure 1). According to the obtained results, the overall survival rate during the 6-month follow-up was 96.7%. Although this value appears relatively high, it should be interpreted cautiously from a clinical perspective. In patients with myocardial infarction who previously had COVID-19 infection, mortality may remain relatively low in the short- and mid-term periods; however, due to pathogenetic mechanisms such as inflammation, endothelial dysfunction, hypercoagulability, and neurohumoral imbalance, the risk of clinical complications persists. Therefore, when clinically significant adverse cardiovascular events were taken into account, the MACE-free survival rate was 75.9%. This difference clearly demonstrates that survival assessment should not be limited only to life preservation but must also include clinical stability, complication-free course, and the patient's functional status.

Rehospitalizations, recurrent myocardial infarction, clinically significant arrhythmias, and the need for coronary revascularization, which were included in the MACE composite endpoint, confirm the persistence of high residual risk in patients who experienced myocardial infarction associated with COVID-19 infection. In particular, exacerbation of chronic heart failure and rhythm disturbances can be considered the main factors contributing to the reduction of MACE-free survival. The obtained data indicate that after myocardial infarction occurring in the setting of COVID-19 infection, treatment strategies at the outpatient stage should not be limited to standard pharmacological therapy.

Licensed under a Creative Commons Attribution 4.0 International License.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

They should also include dynamic clinical monitoring, early detection and correction of chronic heart failure, timely treatment of rhythm disturbances, and individualized decision-making regarding coronary revascularization.

Table 2 Clinical trajectories of residual risk over time during the 6-month follow-up in patients with myocardial infarction and prior COVID-19 infection (Enrolled in follow-up: n = 60; alive at 6 months: n = 58)

Clinical trajectory	Definition	Number of patients	Calculation basis
Early residual risk (0–3 months)	First clinical deterioration/complication recorded within 0–3 months	32	n = 60
Late residual risk (3–6 months)	First occurrence of complications during months 3–6	26	n = 60
Transition to compensation	Residual risk present in the early period followed by clinical stabilization	27	n = 60
Fatal trajectory	Death occurring within the 6-month follow-up	2	n = 60

The results of the 6-month follow-up demonstrated that residual risk manifested in patients at different time intervals. Among the 60 patients included in the follow-up, signs of residual risk were recorded within the first 3 months in 32 patients (53.3%). During this early period, exacerbation of chronic heart failure, clinical instability, and the need for repeated medical consultations were most frequently observed, making this group prognostically the most unfavorable. At the same time, in 26 patients (43.3%), despite relatively stable clinical conditions during the initial months, manifestations of residual risk appeared for the first time during the 3–6-month period. This finding indicates that residual risk may also develop later and suggests the possible progression of pathological processes over time. An important observation was that in 27 patients (45.0%), although signs of residual risk were present during the early period, clinical compensation was achieved during subsequent outpatient follow-up through optimization of treatment strategies. This demonstrates that residual risk is not an absolute and irreversible condition but rather a dynamic process that can be modified through appropriate management. During the 6-month follow-up period, death was recorded in 2 patients (3.3%). These deaths occurred against the background of progression of chronic heart failure and hemodynamic instability and were therefore considered part of the fatal trajectory of residual risk.

Conclusion

The results of the 6-month follow-up in elderly patients who had experienced COVID-19 infection showed that despite a relatively high overall survival rate (96.7%) after myocardial infarction, clinically significant residual cardiovascular risk persists. MACE-free survival was 75.9%, indicating that nearly one in four patients experienced complications within 6 months, including rehospitalization, exacerbation of chronic heart failure, arrhythmias, or the need for repeat revascularization. Although residual risk most commonly manifested within the first 3 months, delayed manifestations were also observed during the 3–6-month period in some patients, reflecting prolonged activity of pathogenic mechanisms. At the same time, clinical compensation could be achieved in a number of patients through optimization of treatment strategies. Thus, elderly patients

Licensed under a Creative Commons Attribution 4.0 International License.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

who experience myocardial infarction in the setting of COVID-19 infection represent a high residual-risk group and require dynamic outpatient monitoring, early correction of chronic heart failure, timely treatment of rhythm disorders, and individualized secondary prevention strategies.

References

1. Gupta A., Madhavan M.V., Sehgal K., et al. Extrapulmonary manifestations of COVID-19. *Nature Medicine*. 2020;26(7):1017–1032.
2. Libby P., Lüscher T. COVID-19 is, in the end, an endothelial disease. *European Heart Journal*. 2020;41(32):3038–3044.
3. Xie Y., Xu E., Bowe B., Al-Aly Z. Long-term cardiovascular outcomes of COVID-19. *Nature Medicine*. 2022;28(3):583–590.
4. Ibanez B., James S., Agewall S., et al. 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation. *European Heart Journal*. 2018;39(2):119–177.
5. Collet J.P., Thiele H., Barbato E., et al. 2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. *European Heart Journal*. 2021;42(14):1289–1367.

Licensed under a Creative Commons Attribution 4.0 International License.