Case Report

Journal Homepage: http://crcp.tums.ac.ir

Late Presentations of Acute Coronary Syndromes in Coronavirus Era: A Case Series

Mohammad Mostafa Ansari Ramandi[1,2], Hossein Yarmohammadi[3], Niloufar Samiei[2]*

1. Research Center of Cardiovascular , Birjand University of Medical Sciences, Birjand, Iran.
2. Heart Valve Disease Research Center, Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences, Tehran, Iran.
3. Medical Students Research Committee, Shahed University, Tehran, Iran.

Use your device to scan and read the article online

Citation: Ansari Ramandi MM, Yarmohammadi H, Samiei N. Late Presentations of Acute Coronary Syndromes in Coronavirus Era: A Case Series. Case Reports in Clinical Practice .2020; 5(Special Issue on Covid-19):3-8.

Running Title: STEMI in Coronavirus Era

Article info:

Received: 26 September 2020

Revised: 12 October 2020

Accepted: 23 November 2020

Keywords:

Cardiovascular disorders; Emergency medicine; Patient Education; Coronavirus

ABSTRACT

Although people with less critical symptoms should not visit hospitals in order to reduce exposure during a pandemic, it is of utmost importance that those experiencing risky symptoms visit in early stages to prevent delayed consequences. In this article, we reported three ST-segment Elevation Myocardial Infarction (STEMI) patients who would have benefited from visiting the hospital earlier while they were experiencing low threshold angina.

Introduction

The pandemic of Coronavirus Disease 2019 (COVID-19) is currently the most crucial health issue and has imposed an enormous psychological burden since its outset in China. Anxiety and depression are a concern among the general public, which should be addressed, especially in the elderly, people with comorbidities, and other populations at risk [1]. Underlying cardiovascular diseases lead to an increased mortality rate in cases with COVID-19. Likewise, COVID-19 can end in severe cardiovascular consequences. Furthermore, the global outbreak of COVID-19 has necessitated the allocation of intensive care unit and related healthcare equipment and staff to new hospital admissions for probable Coronavirus, affecting healthcare delivery to cardiovascular patients [2].

*** Corresponding Author:**
Niloufar Samiei, MD.
Address: *Heart Valve Disease Research Center, Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences, Tehran, Iran.*
E-mail: *drnsamiei@gmail.com, samiei@rhc.ac.ir*

This anxiety and fear of patients regarding hospitals and doctors as an integral part in the face of Coronavirus and shortage in healthcare facilities for cardiovascular patients with no COVID-19 symptoms may result in neglecting these patients and delayed visits and the corresponding repercussions. During the past months, with an increasing rise in the number of COVID-19 patients around the world, many physicians have noticed a substantial decrease in the turnover of the outpatient cardiovascular clinic and emergency ward visits by cardiovascular disease patients. The Figures 1-4 reveal that our hospital has admitted 8 ST-segment Elevation Myocardial Infarction (STEMI) patients in the past 2 months, presenting late, despite suffering from a low threshold of angina prior to the admission, while we only had 2 admissions for STEMI in the course of 8 months preceding the COVID-19 outbreak from the small population of people in Boshruyeh, Iran. However, the number of unstable angina patients visiting the emergency ward has decreased significantly. In this article, we reported three of these patients who would have benefited from visiting the hospital earlier while they were experiencing low threshold angina.

Cases Presentation

Case history 1

A 77-year-old lady complaining of respiratory distress, suffering from hypertension and diabetes mellitus for the past 6 years, in the absence of any other history of diseases, was admitted to the emergency ward. She had been in home self-quarantine for 1 month and experienced nausea and epigastric pain since 4 days before admission. She was treated with anti-emetics and proton pump inhibitors at home, and although her family suspected potential heart disease, she did not acquiesce to be examined at the hospital because of the fear of getting COVID-19.

In a physical examination, she had cold extremities, a blood pressure of 80/60mmHg, and bilateral rales in her lungs. She did not have any murmurs in heart auscultation and no remarkable finding was observed. Electrocardiography (ECG) was done, which showed Q wave formation and ST elevation in precordial leads (Figure 1). Concerning laboratory data, she had a potassium level of 6 mEq/L and creatinine of 2.8 mg/dl. Her troponin level was also elevated and she had metabolic acidosis with a PH of 7.28. Echocardiography was done for the patient, which revealed severely reduced Left Ventricular Ejection Fraction (LVEF) of 20% with regional wall motion abnormality in the anterior circulation and mild mitral regurgitation with no pericardial effusion or cardiac complication.

Considering the LVEF, low blood pressure, and cold extremities, cardiogenic shock was the primary diagnosis for the patient and ionotropic agents were administered. She was also administered dual antiplatelet therapy with anticoagulation. Based on her previous laboratory data, her kidney function had deteriorated in comparison with the past and she also had acute renal failure. Due to the unavailability of the catheterization laboratory in the vicinity (considering the nearest laboratory to be 400 Km far) and her unstable cardiac and renal condition, coronary angiography could not be done for reperfusion. Similarly, there was no possibility for an intra-aortic balloon pump placement or mechanical circulatory support.

She had diuresis and her potassium level decreased to 5.7 mEq/L, yet unfortunately, she experienced cardiac arrest within 3 hours of admission and did not respond to Cardiopulmonary Resuscitation (CPR).

Case history 2

A 58-year-old male patient with a history of hypertension, experiencing typical low threshold angina during a 10-day period before admission, was hospitalized due to chest pain at rest. There were no other accompanying symptoms. Although he knew the symptoms were important and related to his heart, he restrained himself from visiting the hospital, due to the fear of getting a COVID-19 infection.

Physical examination showed that he had stable vital signs and no remarkable finding was obtained. ECG revealed ST-segment elevation in lateral precordial and I and aVL leads (Figure 2). On echocardiographic evaluation, he had LVEF of 45% and hypokinesia of the lateral wall of the LV. There was no access to primary percutaneous coronary intervention within guideline-directed time limits. He did not have any contraindications of thrombolytics and was treated with reteplase at two doses, 30 minutes apart.

His chest pain and ST elevation were resolved. He did not consent to be referred to a tertiary center for early angiography and was discharged in a good condition after 4 days of hospital stay. He is doing well on dual antiplatelet, beta-blockers, angiotensin-converting enzyme inhibitor, and statin therapy one month after discharge and has not done any further evaluation.

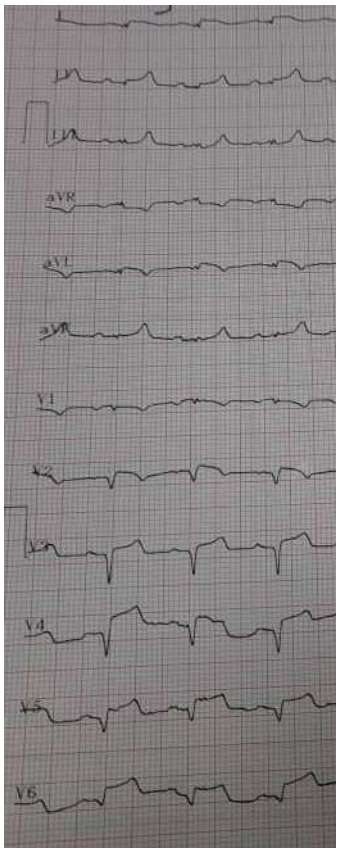

Figure 1. Electrocardiographic presentation of case 1

Showing Q wave formation and ST-segment elevation in precordial leads

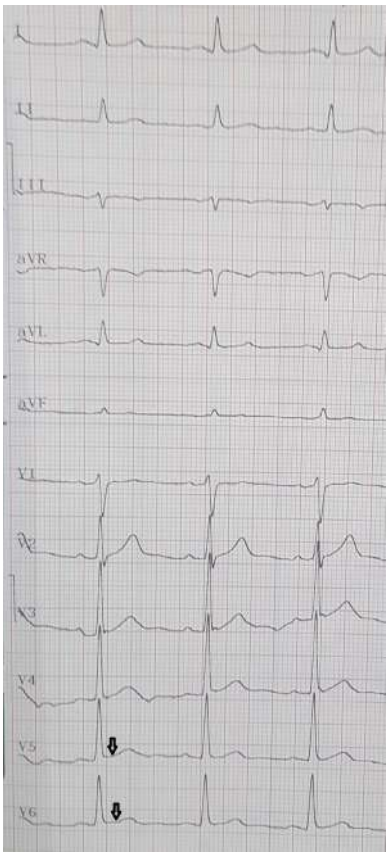

Figure 2. Electrocardiographic presentation of case 2

Showing ST-segment elevation in lateral precordial leads (black arrows)

Case history 3

A 56-year-old male with a history of opium addiction was admitted to our hospital because of severe angina at rest. He had no history of hypertension or diabetes mellitus. He had a normal echocardiography 7 months before admission, due to the symptom of dyspnea. He reported low threshold angina 20 days before admission, and although he was aware of an imminent heart attack, he had taken nitrates from his wife's medications and avoided visiting the doctor because of fear of getting a COVID-19 infection.

Upon admission, he had severe resting chest pain, and just after taking his baseline ECG (Figure 3A), he had ventricular fibrillation and loss of consciousness. Cardiopulmonary resuscitation was carried out for 50 minutes according to the protocol, during which he had multiple episodes of ventricular tachycardia and fibrillation. He was administered with a total dose of 450 mg amiodarone and 90 mg of lidocaine. His initial laboratory measurements showed hypokalemia with a potassium concentration of 2.8 mg/dl and he was administered with normal saline with potassium chloride. After receiving anti-arrhythmic medications and correcting his potassium level, he became hemodynamically stable. His ECG just after CPR is shown in Figure 3B. After partial stabilization of the patient, echocardiography was performed, showing an LVEF of 30% with mild mitral regurgitation and no cardiac complications. As we were not certain about his neurologic status, we decided to keep him a few hours to make sure he has no neurologic deficit before having catheterization done. Fortunately, having an in-hospital cardiac arrest and proper CPR, he did not face any neurologic complications and could be extubated in less than 8 hours. Considering the hemodynamic instability he had and the contraindication for thrombolytic, he was a candidate for primary Percutaneous Coronary Intervention (PCI), which was not available in our hospital. Two hours after extubation, he had normal blood gases and stable hemodynamics and was stable enough to be transferred by an ambulance for 400 km to a tertiary center for coronary angiography.

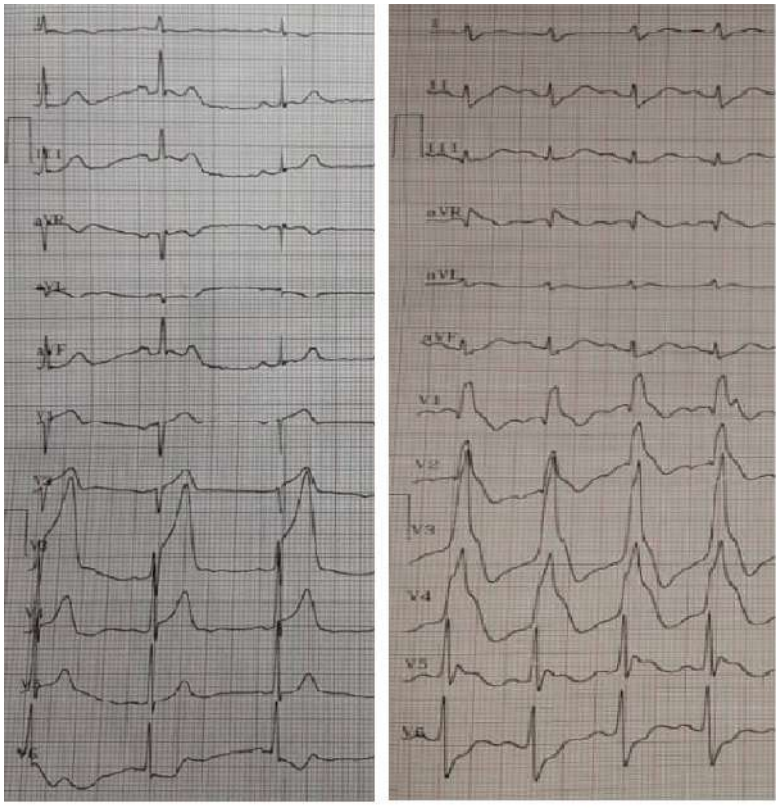

Figure 3. A: Electrocardiographic presentation of case 3

A: Showing ST-segment elevation in V1-V4. B: Electrocardiography after cardiopulmonary resuscitation showing Tombstone pattern

During coronary angiography, he had an occluded Left Anterior Descending (LAD) artery proximal to mid-portion, and PCI was done successfully without any complication (Figure 4A, B). He is doing well after PCI and has had no angina symptoms for a month.

Discussion

The patients presented are real practical examples in a single hospital during the COVID-19 outbreak. Many patients are afraid of visiting hospitals with the impression of getting infected at these sites [3]. Statistics in differ-

Figure 4. A: Right anterior oblique angiographic view with caudal angulation showing occluded Left Anterior Descending (LAD) artery in proximal to mid part (black arrow). B: Right anterior oblique angiographic view with caudal angulation showing the wiring and percutaneous coronary intervention of LAD

ent countries indicate that fewer patients are admitted into hospitals and receive treatments [4]. Management of STEMI patients during the COVID-19 outbreak seems to be challenging due to the lack of time for coronavirus screening tests; however, current guidelines of the American College of Cardiology and European Society of Cardiology have indicated that each of these patients has to be assessed based on COVID-19 manifestations and PCI remains to be the standard treatment. To save those with low cardiovascular risk and also cases at high risk for COVID-19 or confirmed COVID-19 cases, treatment with fibrinolytic can be performed [2, 5].

It might be ostensibly wise to avoid hospitals as long as it does not make high-risk patients neglect the importance of their symptoms. All 3 cases presented suffered from low threshold angina and knew that the pain was caused by their heart. They would have benefited if they had visited the doctor in the early stages of their symptoms.

To solve this issue, we believe that it is important to make patients with previous cardiovascular diseases informed about the importance of new symptoms or the corresponding changes, such as chest pain. This education should not only be limited to previously diagnosed cardiovascular patients but also the general public to know when to visit hospitals or other healthcare facilities. Academic professionals can also help in this respect by raising awareness in social media concerning the important cardiovascular signs and symptoms that need attention and a hospital visit.

Telemedicine is now an opportunity that is conspicuous by its absence more than before for patients' follow-up and even screening individuals with cardiovascular risks and deciding whether they should be visited in the hospital or not [6]. Using telemedicine, at least it is possible to prevent neglecting important symptoms and missing acute conditions, such as STEMI during COVID-19 pandemic, with minimum exposure. While telemedicine has proved successful in areas where it has already been established or there are sufficient capacities, unfortunately, in some rural regions with less access to the internet or other ways of communication, its usage is not feasible.

Taking into account the national and regional potentials of healthcare systems could be helpful. For example, in Iran and especially in its rural regions that have fewer facilities and equipment, the national rural family physician programs are an important part of health care delivery [7]. Local general practitioners can be in touch with the people of that region and facilitate the management of acute cardiovascular conditions during the COVID-19 pandemic. Therefore, all these opportunities should be considered by physicians and healthcare stakeholders to take measures to optimize the healthcare delivery to those patients in need of urgent medical intervention, yet afraid of COVID-19 infection risk in hospitals.

Apart from telemedicine, we also suggest that some hospital facilities, such as outpatient clinics of specialists who rarely visit infectious disease patients should be separated from the internal medicine and infectious disease clinics, to assure the safety of these places for those visiting. There should also be a fair distribution of resources and diagnostic tools nationwide, to help manage these patients in their cities to obviate the need for further referral.

We emphasize the fact that COVID-19's shadow should not make the healthcare workforce or the general public neglect other diseases and think that they have gone on holiday leave. Taking cardiovascular signs and symptoms seriously and taking timely actions can prevent late presentations of acute coronary syndromes and the extra burden on the healthcare system in this era.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles are considered in this article. The participants were informed of the purpose of the research and its implementation stages. They were also assured about the confidentiality of their information.

Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

Conflict of interest

The authors declared no conflict of interest.

Acknowledgements

We would like to acknowledge the help provided by Mr. Amirabbas Qassemi for editing and revising the language of the manuscript.

References

[1] Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. International Journal of Environmental Research and Public Health. 2020; 17(5):1729. [DOI:10.3390/ijerph17051729] [PMID] [PMCID]

[2] Driggin E, Madhavan MV, Bikdeli B, Chuich T, Laracy J, Biondi-Zoccai G, et al. Cardiovascular considerations for patients, health care workers, and health systems during the COVID-19 pandemic. Journal of the American College of Cardiology. 2020; 75(18):2352-71. [DOI:10.1016/j.jacc.2020.03.031] [PMID] [PMCID]

[3] Tam CC, Cheung KS, Lam S, Wong A, Yung A, Sze M, et al. Impact of coronavirus disease 2019 (COVID-19) outbreak on ST-segment Elevation Myocardial Infarction care in Hong Kong, China. Circulation: Cardiovascular Quality and Outcomes. 2020; 13(4):e006631. [DOI:10.1161/CIRCOUTCOMES.120.006631] [PMID] [PMCID]

[4] Huet F, Prieur C, Schurtz G, Gerbaud E, Manzo-Silberman S, Vanzetto G, et al. One train may hide another: Acute cardiovascular diseases could be neglected because of the COVID-19 pandemic. Archives of Cardiovascular Diseases. 2020; 113(5):303-7. [DOI:10.1016/j.acvd.2020.04.002] [PMID] [PMCID]

[5] Daniels MJ, Cohen MG, Bavry AA, Kumbhani DJ. Reperfusion of STEMI in the COVID-19 era: Business as usual? Circulation. 2020; 141(24):1948-50. [DOI:10.1161/CIRCULATIONAHA.120.047122] [PMID] [PMCID]

[6] Portnoy J, Waller M, Elliott T. Telemedicine in the era of COVID-19. The Journal of Allergy and Clinical Immunology: In Practice. 2020; 8(5):1489-91. [DOI:10.1016/j.jaip.2020.03.008] [PMID] [PMCID]

[7] Naseriasl M, Janati A, Amini A, Adham D. Referral system in rural Iran: Improvement proposals. Cadernos de Saude Publica. 2018; 34(3):e00198516. [DOI:10.1590/0102-311x00198516] [PMID]