

# Management of patients with acute coronary syndrome during the emergency COVID-19 pandemic: Italian association of hospital cardiologists experience

## Abstract

The COVID-19 pandemic has become a global health emergency. In Italy, the number of people infected by SARS-COVID-2 is rapidly increasing and what emerges from the current data is that the majority do not present any symptoms or only minor flu-like symptoms. In a patient presenting with ST elevation (STEMI) myocardial infarction or STEMI-like, if positive to COVID-19, the reperfusion therapeutic strategy depends on the local organization and on the possibility to access without delay a PCI COVID Center, on the basis, obviously, of the risk/benefit assessment of the individual case. However, we advise to try pursuing, in the first instance, the mechanical revascularization strategy, according to the available local possibilities.

**Keywords:** Acute coronary syndrome • STEMI • SARS-COVID 19 • Primary PCI

## Introduction

The COVID-19 pandemic has become a global health emergency [1,2]. In Italy, the number of people infected by SARS-COVID-2 is rapidly increasing and what emerges from the current data is that the majority do not present any symptoms or only minor flu-like symptoms. In about 20% of the patients, the disease progresses towards more complex forms (interstitial pneumonia to acute respiratory distress and multiple organ failure) with the need of hospitalization in CICU and advanced ventilator assistance [3-5]. The transmission of the virus occurs very easily from the symptomatic patients droplets from coughing and sneezing and from direct contact with persons or surfaces. In a patient presenting with ST elevation (STEMI) myocardial infarction or STEMI-like, if positive to COVID-19, the reperfusion therapeutic strategy depends on the local organization and on the possibility to access without delay a PCI COVID Center, on the basis, obviously, of the risk/benefit assessment of the individual case. However, we advise to try pursuing, in the first instance, the mechanical revascularization strategy, according to the available local possibilities.

Among the risk factors associated with increased mortality from COVID-19-besides male gender and age-the following are to be considered risk factors: Hypertension, diabetes mellitus, a history of cardiovascular, and cerebrovascular events [6,7]. The mortality rate for acute myocardial infarction during SARS by coronavirus was 2.6%, on an overall mortality rate linked to the infection of 6.6% [8-10]. In consideration of the epidemiological framework described, we have to consider all the patients that we examine for Acute Coronary Syndrome (ACS) as potential COVID-19.

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This aspect is particularly important for the safety of the other hospitalized patients, of our hospitals and of our healthcare professionals (physicians, nurses, residents, social healthcare workers, and radiology technicians) who are directly involved in the management of the patient. Therefore, the cardiologist must be ready to manage any cardiac emergency by guaranteeing the adequate therapy but at the same time, must protect the healthcare professionals from the risk of infection and optimize the available individual protection resources [11,12].

### Management of Acute Coronary Syndrome

The regional STEMI–NSTEMI network for the management and treatment of COVID-19 or suspect COVID-19 patients should be characterized by the existence of at least 1 HUB COVID Center with two cath labs, one exclusively for COVID-19 or suspect COVID-19 patients and a dedicated zone and an intensive care unit (not necessarily cardiologic) for the isolation and treatment of COVID-19 or suspect COVID-19 patients and in network with a COVID Unit. If the HUB-COVID Center is not available for COVID-19 or suspect COVID-19 patients, the Spoke Center must alert the catheter room of a HUB-NO COVID Center.

In this case, provisions must be made to transfer the patient to a COVID Unit after the procedure; the cath lab and the rooms utilized will obviously have to undergo sanitization before performing any further procedures. In case of a suspect COVID-19 patient who, of his own accord, refers to the ER of a NO-COVID Center with a H24 cath lab, all safety precautions must be activated, both in the catheter room and along the entire patient's route, as per local protocol. Subsequently, the patient must be transferred to a COVID Unit or admitted to a specific therapeutic intensive unit (not necessarily cardiological) dedicated to the isolation and treatment of COVID-19 patients. The COVID-19 patient, who comes from a Spoke Center, must be hospitalized after the procedure and then transferred to a COVID Unit in a specific isolation area of the HUB-COVID Center of reference.

Thrombolysis, after a careful evaluation of the risk/benefit ratio can be considered as an alternative to primary PCI in patients with a STEMI, keeping in mind that thrombolysis in COVID-19 patients could worsen the prognosis by causing an onset of disseminated intravascular coagulopathy. Therefore, this therapy should be taken into consideration only when a primary PCI cannot be performed within the timeline provided by the guidelines. In suspect intermediate-low risk COVID-19 patients with myocardial infarction without ST-segment elevation (NSTEMI) admitted to a Spoke Centre, and when urgent coronagraphy is indicated, a nasopharyngeal swab or other diagnostic methods like

chest radiography, transthoracic computed tomography, must be performed. In case of positive testing for COVID-19, the patient must be transferred to a HUB-COVID Center and subsequently to a COVID-19 Unit. In case of negative testing for COVID-19, the patient can be transferred to a HUB-NO-COVID Center [13].

About 20%-30% of patients positive for COVID-19 suffer from myocardial damage with an increase of troponin, indicating a Type 2 myocardial infarction. Specifically, respiratory distress, multi-organ impairment, and the patient's age, associated with an increase of troponin. Therefore, in these patients, the risk/benefit ratio of an invasive procedure must be appropriately assessed-especially in patients who do not present haemodynamic instability. In this case, an optimal drug therapy is a reasonable choice, deferring the indication of a coronary angiography to a later stage [14,15].

The Territorial Emergency System personnel provides the results of the electrocardiogram, collects and communicates a detailed anamnesis on any potential contact with persons suffering from COVID-19 and on any suspect symptomatology (cough, cold, fever, dyspnoea, etc.) that the patient has had during the 14 days prior to hospitalization. The same screening must be performed on patients who refer to the ER or are admitted from other centres. All patients must be provided with surgical masks until the diagnosis is determined.

### References

1. Grasselli G, Pesenti A, Cecconi M. Critical care utilization for the COVID-19 outbreak in Lombardy, Italy: Early experience and forecast during an emergency response. *JAMA*. 323(16): 1545 (2020).
2. Spina S, Marrazzo F, Migliari M, et al. The response of Milan's emergency medical system to the COVID-19 outbreak in Italy. *Lancet*. 395: e49-e50 (2020).
3. Guan W-J, Ni Z, Hu Y, et al. China medical treatment expert group for Covid-19. Clinical characteristics of coronavirus disease 2019 in China. *N Engl J Med*. 382: 1708-1720 (2020).
4. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 395: 497-506 (2020).
5. Wu C, Chen X, Cai Y, et al. Risk factors associated with acute respiratory distress syndrome and death in patients with coronavirus disease 2019 pneumonia in Wuhan, China. *JAMA Intern Med*. 180(7): 934-943 (2020).
6. Chen C, Chen C, Yan JT, et al. Analysis of myocardial injury in patients with COVID-19 and association between concomitant cardiovascular diseases and severity of COVID-19. 48(7): E008 (2020).
7. Madjid M, Safavi-Naeini P, Solomon SD, et al. Potential effects of coronaviruses on the cardiovascular system: A review. *JAMA Cardiol*. 5(7): 831 (2020).
8. Peiris JSM, Chu CM, Cheng VCC, et al. Clinical progression and viral load in a community outbreak of coronavirus associated SARS pneumonia: A prospective study. *Lancet*. 361: 1767-1772 (2003).

## Commentary

9. Chong PY, Chui P, Ling AE, et al. Analysis of deaths during the severe acute respiratory syndrome (SARS) epidemic in Singapore: Challenges in determining a SARS diagnosis. *Arch Pathol Lab Med.* 128: 195-204 (2004).
10. 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.* 5(7): 802 (2020).
11. Zeng J, Huang J, Pan L. How to balance acute myocardial infarction and COVID-19: The protocols from sichuan provincial people's hospital. *Intensive Care Med.* 46: 1111–1113 (2020).
12. Welt FG, Shah PB, Aronow HD, et al. American college of cardiology's (ACC) interventional council and the society of cardiovascular angiography and intervention (SCAI). Catheterization laboratory considerations during the corona-virus (COVID-19) pandemic: From ACC's Interventional Council and SCAI. *J Am Coll Cardiol.* 75: 2372–2375 (2020).
13. Scotto di Uccio F, Valente S, Colivicchi F, et al. Anmco position paper: Network Organization for the Treatment of Acute Coronary Syndrome Patients during the Emergency COVID-19 Pandemic. *Eur Heart J. Supplements.* 22(SG): G223–G227 (2020).
14. Zeng J, Huang J, Pan L. How to balance acute myocardial infarction and COVID-19: the protocols from Sichuan Provincial People's Hospital. *Intensive Care Med.* 46: 1111–1113 (2020).
15. Welt FG, Shah PB, Aronow HD, et al. American College of Cardiology's (ACC) Interventional Council and the Society of Cardiovascular Angiography and Intervention (SCAI). Catheterization laboratory considerations during the corona-virus (COVID-19) pandemic: from ACC's Interventional Council and SCAI. *J Am Coll Cardiol.* 75: 2372–2375 (2020).