

Resilience with the crisis: cardiology department experience to cope with the corona virus disease 2019 pandemic

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Rationale

During the coronavirus disease (COVID-19) pandemic, there were many challenges facing practices in different medical specialties.

Objectives

Maintain medical and educational services provided by Cardiology Department at the required standards amid the COVID-19 pandemic.

Methods

We described our experience in restructuring various strategies and activities and developing adaptive measures to cope with the crisis.

Results and Conclusion

Multiple considerations and self-adjusting adaptations are mandated in challenging situations like the COVID-19 crisis. Exchanging experiences is needed to improve performance in similar future situations.

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Corona virus disease 2019 (COVID-19) caused by SARS-CoV-2 has rapidly posed a huge burden on health care systems worldwide. The substantially high human-to-human transmissibility compared with its predecessors (SARS and MERS outbreaks), rapidly qualified SARS-CoV-2 as a global pandemic [1].

Although respiratory system is the main target of corona virus family, SARS-CoV-2 was distinguished for multiple extrapulmonary manifestations and complications. Not infrequently, these extrapulmonary findings are the prevailing manifestations, and if complicated, can be the direct cause of death in advanced cases [2]. Accordingly, COVID-19 disease became a multisystem disease and mandated cooperation and interaction of all medical disciplines. Evidence of a strong association linking COVID-19 and cardiovascular disease had been ascertained. Patients with cardiovascular disease are more susceptible to contract infection and to have more severe illness and worse prognosis [3]. Numerous reports have emerged on acute myocardial infarction (AMI) presentations, with no or minimal pulmonary symptoms, which upon completion of the workup indicate that they had SARS-CoV-2 infection that precipitated or caused AMI [4,5]. This significantly affected the clinical practice of cardiovascular medicine. Thereby, Cardiology Department in Cairo University restructured tailored protocols and strategies to cope with the crisis, essentially in

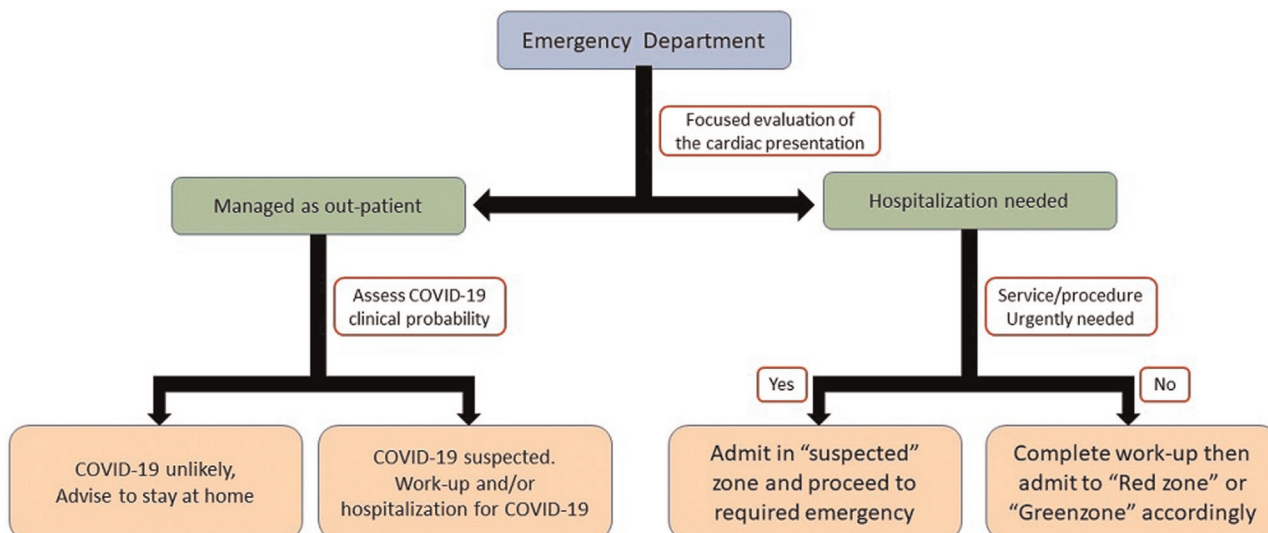
patients' services, yet in education and research as well.

Patient service

With the peaking of COVID-19 infection rates in Egypt, the cardiology department – as part of Cairo University Hospitals strategy – foresaw to limit nonurgent clinical visits and admissions, aiming to minimize the crowd and limit chances of spreading infection among the attending/hospitalized patients. Thus, restructuring initial triaging and stratification of patients in emergency departments was fundamental. On the contrary, the high rate of undiagnosed COVID-19 cases in the community represented an overwhelming challenge to any health system. Accordingly, a quick and effective emergency department protocol was developed to standardize a focused evaluation of presenting patients dictating further management (Fig. 1). The focused evaluation encompassed assessment of the cardiac complaint stratifying the need for hospitalization and/or urgent medical or interventional service, in addition to assessment of clinical probability of COVID-19 disease.

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Figure 1



Focused evaluation and stratification for emergency department attendees.

Stable nonurgent conditions had medical adjustment and then discharged and managed as outpatient service. The probability of COVID-19 infection, after revision with chest specialists, would direct for further investigations, home isolation, or hospitalization. Conversely, if the patient is indicated for hospitalization for a nonurgent procedure, complete screening and work-up for COVID-19 were completed to decide the inpatient locality ('red zones' isolation wards for COVID-19 positive, or 'green zones' for negative cases). Patients in need for urgent or emergent procedures (like AMI requiring revascularization) were immediately admitted to a designated 'suspected cases' zone to receive the required service promptly, deferring completion of COVID-19 workup after stabilization. The detailed protocol of management of acute coronary syndrome (ACS) cases developed by Cardiology Department of Cairo University hospitals to cope with the crisis was published in *European Heart Journal* [6]. Figures 2 and 3 brief the tailored algorithms for ACS management. Protection of the health team and rigorous measures to limit chances of patient-to-patient transmission were a priority, and to be detailed in a separate section.

Cardiopulmonary resuscitation in the era of corona virus disease 2019 pandemic

Being an aerosol-generating procedure, cardiopulmonary resuscitation (CPR) for suspected cases required critical modifications to minimize risks of spreading the infection. The department issued a scientific statement on CPR during the COVID-19 era, highlighting the necessary modifications. Multiple webinars and virtual

meetings were held to raise physicians' awareness about appropriate practices to ensure provision and appropriate CPR to cardiac arrest victims without compromising safety of the rescuers.

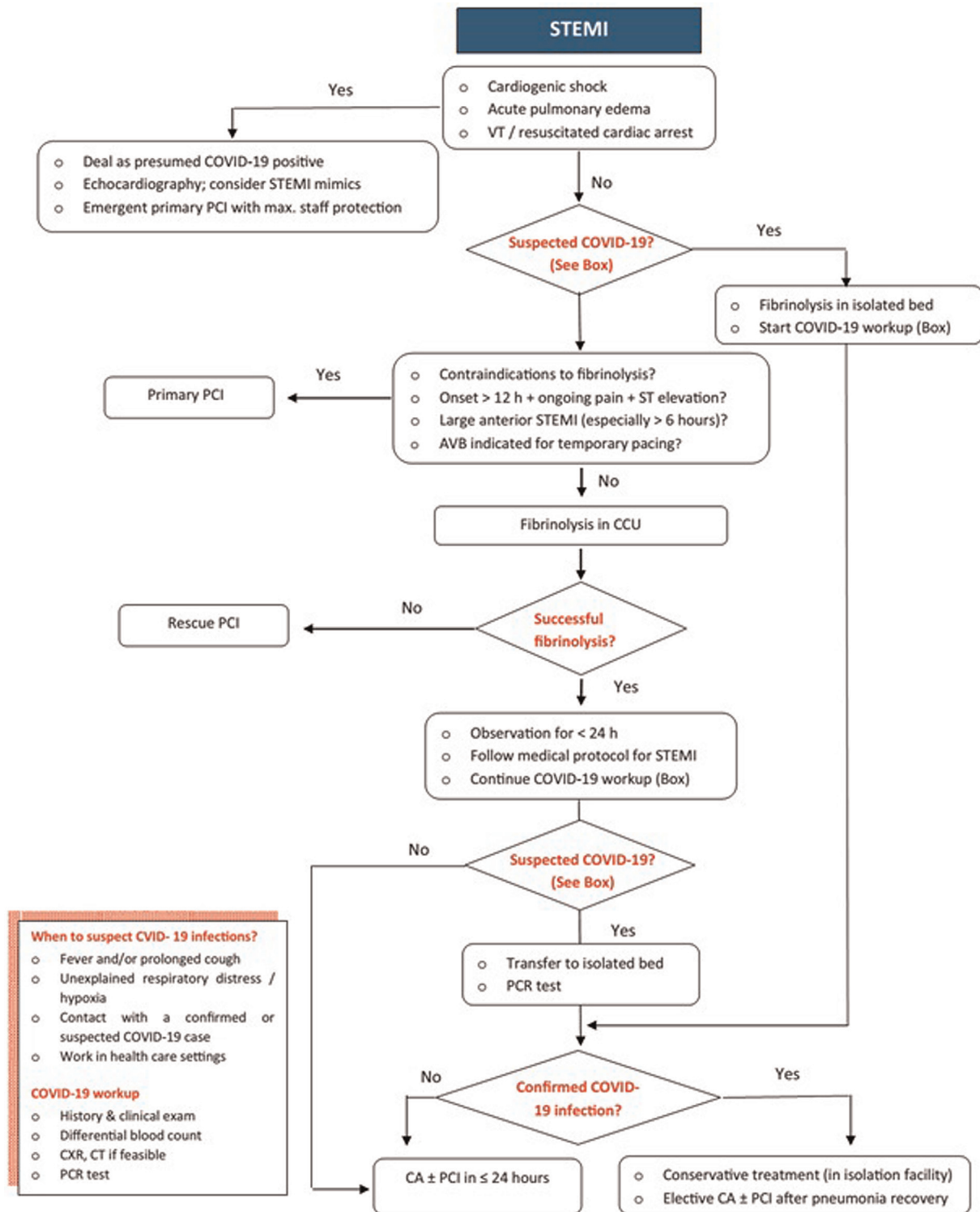
Medical staff protection strategies

A comprehensive strategy for protection of exposed medical staff was considered a priority during the pandemic. Health education and awareness were critical pillars to ensure self-safety while considering the limited resources and the shortage of personal protective equipment (PPE). Physicians in the emergency department were equipped with full PPE (N95 mask, face shield or eye goggles, long sleeve gown, and gloves). All attending patients were provided face masks if they do not have one. In the inpatient wards, only one doctor and one nurse with full PPE were assigned to care for a suspected case. Cases were isolated in separate rooms with strict measures to limit spread of infection. Confirmed positive cases were comanaged with chest specialty. Diagnosis of COVID-19 was confirmed by PCR testing of a nasopharyngeal swab. Nasopharyngeal swab is to be repeated if the result is negative while the clinical suspicion remains high, and PPE remains activated till a second negative PCR result come up. The whole team was kept updated with any renewal or modification of 'suspected' definition, as well as diagnostic and therapeutic strategies.

Educational activities

Traditionally, daily scientific activities are regularly held by the Cardiology Department with contribution of the eminent academic staff and occasionally with

Figure 2

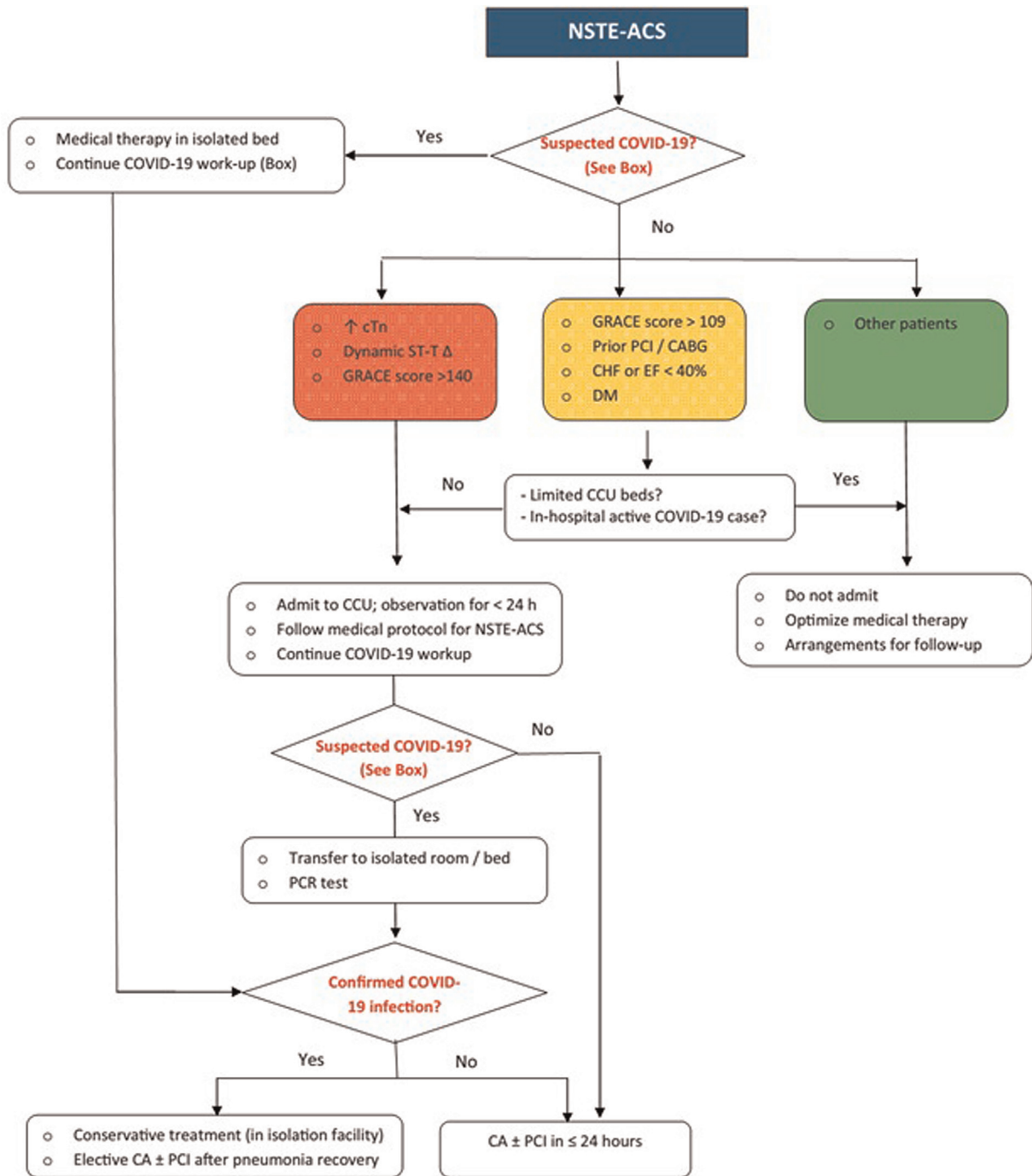


Modified STEMI management protocol. AVB, atrioventricular block; CA, coronary angiography; PCI, percutaneous coronary intervention; VT, ventricular tachycardia.

collaboration with other disciplines from in or outside Cairo University. These activities and sharing experiences contributed strongly in the education and excellence of all generations in Cardiology Department. During the COVID-19 pandemic, all these activities were transformed into virtual meetings and webinars in order not to discontinue the educational activities. The

ease of the electronic platform permitted to expand the activities beyond the Egyptian boundaries, and a bimonthly webinar was conducted in collaboration with a foreign faculty. The virtual meetings were indeed a beneficial trend that allowed to experience an uncommonly utilized trend for continuous medical education.

Figure 3



Modified management protocols for non-ST segment elevation-acute coronary syndromes (NSTE-ACS). CA, coronary angiography; CABG, coronary artery bypass surgery; CHF, congestive heart failure, CTn, cardiac troponin; DM, diabetes mellitus; EF, ejection fraction; GRACE, Global Registry of Acute Coronary Events; PCI, percutaneous coronary intervention.

Research targeting corona virus disease 2019

Despite a globally observed decline in ACS presentations by 30–50%, many concerns were raised questioning if this is a true decline or simply under-reporting owing to patients’ reluctance to present to health care facilities for the fear of contracting COVID-19 infection. Accordingly, since declaring

the COVID-19 as a global pandemic, the Cardiology Department in Cairo University Hospitals launched a registry recruiting all ACS cases, recording and monitoring trends in patients’ presentations, their management, and outcomes. The main target was to continuously evaluate and then to modify and improve ACS management protocols to cope with the COVID-19 pandemic [6].

The (COVID-ACS) registry soon gained interest from other universities and educational institutions and shortly become a multicenter registry involving six large Egyptian centers. Prospective data collection is currently running in each of Cairo University Hospitals, Ain-Shams University Demerdash and Al-Oboor hospitals, Al-Azhar University Bab El-Shaeria and Al-Azhar Damietta hospitals, and National Heart Institute. There are periodic meetings among investigators to exchange experiences and lessons learnt in dealing with ACS cases amid such global crisis. Publication of a final report of the Egyptian multicenter COVID-ACS registry is awaited in the near future.

In summary

Resilience with a global crisis necessitates thoughtful considerations to overcome the challenging situation. Cardiology Department in Cairo University Hospitals utilized a lot of adaptations and restructuring of its services and activities to cope with the COVID-19 pandemic. This self-adjustment was a good experience to accommodate unfortunate events that can be helpful in similar situations.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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