

Considerations on Cardiac Patients During Covid-19 Outbreak

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Abstract

SARS-CoV-2 not only causes viral pneumonia but has major implications for the cardiovascular system. Nevertheless, we assisted to a drastic reduction in the number of ACS during this period. Telemedicine and telecardiology, intended as integration to the traditional management appear precious tools especially in Covid-19 era. Given the decrease in new Covid-19 cases worldwide²⁰, now we are approaching the so-called “Phase 2” challenge of a gradual return to pre-Covid-19 life. The epidemiological and clinical situation is rapidly evolving and practice patterns with policies depend on institutions and local availability.

The ongoing coronavirus disease (Covid-19) pandemic have challenged globalized societies to cope with the adoption of revolutionary health care measures for the world survival. The severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), not only causes viral pneumonia but also acute myocardial injury and chronic damage to the cardiovascular system¹. In this time, the healthcare of patients with cardiovascular disease (CVD) needs to be guaranteed, albeit with changes in the modalities. A network of “*hub*” and “*spoke*” centers based on a system of specialized Covid-19 referral hospitals has been rearranged in order to guarantee optimal medical care to patients with cardiac emergencies. In Lombardy, Italy (the epicenter of the European outbreak), the regional network for ST-elevation myocardial infarction (STEMI) management has been reorganized, reducing by more than 75% the number of previous referral centers with 24 hours/7 days a week capacity to perform a primary percutaneous coronary intervention, according to local medical and logistic resources, with 13 hospitals acting as “hubs” and other 42 acting as “spokes”². Generally, we have witnessed a drastic reduction of patients referring non-Covid-19 related symptoms to the Emergency Department. The fear of contagion has caused a significant drop of improper access to the hospital facilities. In particular, national and international registries have reported a significant decrease in the number of admissions for acute coronary syndromes (ACS). In Northern Italy a significant decrease in ACS-related hospitalization rates was reported. Realistically, more and more people with ACS have not sought for medical attention and have been left untreated, as it is confirmed by the increase in delayed presentation of the ACS treated in hospital and their higher mortality. Therefore, an alarming increase in worse outcomes are expected in the near future.

The problem is furtherly amplified by the uncertain trend of this pandemic and the not clearly predictable duration of the isolation. Hence, the limited mobility measures and the weak integration between hospitals and territorial medicine, especially in high-risk areas, constitutes an additional issue. The most vulnerable cardiac Covid-19-free subjects, such as patients with chronic cardiac disorders (i.e. heart failure), are set away from the hospital facilities. A rapid reorganization of cardiac services and practical guidance on how to manage chronic patients are needed in the shortest time. Telemedicine and telecardiology, integrated to the traditional management, appear to be precious tools for this emergent medical model, focused on the interplay of social, economic, environmental and clinical factors. The flexible use of telematic devices, now available for teleconsultation and/or remote monitoring, allows the creation of integrated and personalized

management programs, that are effective and efficient for patients. Indeed, in order to minimize risks of in-hospital SARS-CoV-2 spreading, telemedicine should be adopted whenever possible, especially for frail and older patients. Telemedicine is crucial in handling this viral outbreak containment, preventing patient health from deteriorating because of mistreated CVD while coping with the high infectious risks³. Also, telerehabilitation should be considered as an option for patients discharged from hospitals after an ischemic event and healthcare providers should be aware of the potential for innovative program delivery models.

Both European and American Societies have shown to be up to the challenge, providing statements and recommendations on how to manage cardiac patients in this critical period^{4,5}, and, more importantly, encouraging the rapid sharing of clinical experience and knowledge through any available sources (e.g. webinars, free on-line access to mostly all medical resources). One of the most burning issues has been the appropriate use of cardiovascular imaging in diagnosis and management of both Covid-19 and non-Covid-19 patients. It has become widely accepted that traditional cardiovascular risk factors, particularly older age, previous CVD, diabetes, and hypertension increase significantly the risk of mortality in Covid-19 patients¹. Therefore, indications and recommended procedures to assess cardiovascular function in suspected or confirmed Covid-19 cases needed to be standardized. The shared principles at the base of cardiovascular imaging has been the appropriateness of indication and the selection of the exam that is most likely to substantially change patient management, with the shortest duration and the safest for healthcare providers. Transthoracic echocardiography could be very useful in this setting, since it allows a bedside cardiac and respiratory assessment and remote interpretive assistance if needed, but unfortunately requires close contact to the patient. Therefore, Focused Cardiac Ultrasound Study (FoCUS), Ultrasound Assisted Physical Examination (UAPE) and Point Of Care Cardiac Ultrasound (POCUS) are recommending, according to American Society of Echocardiography, to reduce the duration of exposure and to limit the use of additional resources. Special attention has been dedicated to personal protective equipment, which should be adequate to the risk level of the patient with regard to Covid-19 (low/minimal: not suspected; moderate: suspected; high: confirmed), evaluated before the exam. Therefore, careful planning and review of medical history of the patient are crucial to obtain diagnostic views but should also be comprehensive enough to avoid the need to return for additional images. Because of the high risk of aerosolization, transesophageal echocardiography should be replaced by alternative imaging modalities whenever possible. Computed tomography (CT) has gained attention, not only for its crucial role in confirming Covid-19 pneumonia, but also for the possible synergies and opportunities in evaluating cardiac morphology. Coronary CT has been shown to be accurate in the evaluation of both chronic and ACS, and thus can non-invasively provide information to solve doubtful situations, e.g. unexplained elevation of cardiac troponins, that is frequently encountered in Covid-19 patients. Cardiac magnetic resonance (CMR) should be provided for urgent care to patients who have no known active Covid-19. When necessary, performing CMR on patients with confirmed or suspected SARS-CoV-2 infections should focus on the specific clinical question with an emphasis on myocardial function and tissue characterization while optimizing patients and staff safety. At this time CMR have had marginal role so far, due to long duration of exams and the limited availability. Nevertheless, in patients with confirmed SARS-CoV-2 infections and underlying CVD or developing ischemic or inflammatory injury, indications for CMR may arise. Being the gold standard for evaluation of cardiac function and tissue characterization, CMR may offer an effective choice to obtain critical information for clinical decision-making. If cardiovascular imaging in Covid-19 patients could be challenging, the management of non-Covid patients may be even more complicated. Both American and European Societies of Cardiology recommend the deferral or even the cancellation of elective non-urgent and routine follow-up visits, encouraging the use of telemedicine, in order to avoid SARS-CoV-2 spreading and to protect healthcare workers. However, the triage of patients with CVD is seldom black or white: many patients could overlook signs and symptoms of clinical worsening when reporting to physicians. Moreover, SARS-CoV-2 infections share symptoms, like shortness of breath, fatigue, weakness and sometimes chest pain, which are in common with ACS, pulmonary embolism and acute heart failure.

CONCLUSIONS

SARS-CoV-2 has major implications for the cardiovascular system. Given the decrease in new Covid-19 cases

worldwide, now we are approaching the so-called “Phase 2” challenge of a gradual return to pre-Covid-19 life. The epidemiological and clinical situation is rapidly evolving and practice patterns with policies depend on institutions and local availability. We expect a continue and progressive update of the recommendations, which serve as general framework in cardiac patients.

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