EDITORIAL

COVID-19 Pandemic and Cardiovascular Challenges

Theodora Benedek

“George Emil Palade” University of Medicine, Pharmacy, Sciences and Technology, Târgu Mureș, Romania

The recent COVID-19 pandemic impacts different levels of modern society on an unprecedented level. From the perspective of cardiovascular medicine, the recent outbreak of the new coronavirus infection is associated with several major challenges that may influence our practice of medicine on a short or even longer term.

Analysis of COVID-19 fatality rates in countries with a high number of infections indicate that people with cardiovascular diseases are most exposed to the risk of death following infection with the new coronavirus. For instance, analysis of a group of 355 COVID-19 patients who have died in Italy showed that 30% of them had ischemic heart disease, 35% had diabetes, 24.5% had atrial fibrillation, and 9.6% had stroke as pre-existing comorbidities.¹ This is in line with the already documented link between cardiovascular comorbidities and fatality rates in infections with coronaviruses, and indicates that in the setting of a viral pandemic, cardiac patients represent a high-risk group that requires special attention and dedicated treatment strategies.²

Over the last decades, in the attempt to provide the most effective life-saving therapy for cardiac patients, international scientific societies have released many guidelines for the treatment of various heart diseases, which have been implemented in clinical practice on a large scale. However, adherence to guidelines in the COVID era may represent a serious challenge for cardiology practitioners, and failure to provide the most effective recommended therapy could be reflected in a significant increase of cardiovascular mortality in a very close future.

One of the most surprising findings observed in all the countries facing the COVID pandemic is that the

number of presentations with ST-segment elevation acute myocardial infarction (STEMI) has been reduced by 50–70%. The same is true for all the other types of cardiovascular emergencies (acute heart failure, hypertensive emergencies, pulmonary embolism etc.). This does not mean that the risk of heart attacks was reduced or that the population has cured from cardiovascular diseases. Moreover, it is well known that any infection, leading to increased systemic inflammation, is associated with a higher risk of acute cardiovascular events in people with underlying atherosclerosis. The significant reduction in cardiovascular emergencies presentations can be explained only by the fact that patients are scared to present to the hospital, which they consider to be a dangerous place. As a consequence, a significant proportion of patients with chest pain prefer to remain at home, and many of them will die at home or will develop post-infarction heart failure, with significant reduction in their quality of life and increased costs for their healthcare, on a long term.

At the same time, as the outbreak appeared unexpectedly, there are no current guidelines released by scientific societies on how to manage STEMI or NSTEMI cases in the COVID areas. No network-based protocols for patient transfer and urgent admission to the cath lab seem to effectively function in COVID-affected regions, and there are even some suggestions to return to thrombolysis in order to protect both patients and physicians from infection. It is indeed sad that after spending three decades and a huge amount of resources for implementing network-based protocols for life-saving treatment in acute myocardial infarction, now we have to ignore guideline

recommendations and return to a treatment that we have tried so hard to replace.

Another big challenge is the one related to treatment with ACE inhibitors, which has been suggested to increase the risk of developing a severe form of COVID-19 pneumonia.^{3,4} The reason behind this hypothesis relies on the fact that the new coronavirus utilizes ACE2 as receptor for cell entry. Therefore, upregulation of ACE2 receptors, as encountered in people taking ACE inhibitors or AGT II receptor inhibitors, may favor the action of the virus and increase the susceptibility of the heart to SARS-CoV-2 infection. At the same time, it has been demonstrated that patients with heart failure may present a higher risk of heart attack and develop a severe condition after infection, as a result of the overexpression of ACE2 receptors in their hearts.^{3,4} A huge proportion of patients with cardiovascular diseases are taking ACE inhibitors or AGT II blockers, this group representing one of the most frequently prescribed drugs in cardiovascular medicine. Since there are no current data to demonstrate the cause-effect relationship between this treatment and COVID-19 mortality, the current recommendation of the scientific societies is to not interrupt the administration of ACE inhibitor therapy, which has been demonstrated to save lives. Many expert groups say that stopping ACE inhibitors may cause more deaths than the new coronavirus. However, the population of high-risk cardiac patients, scared by the possibility to be infected and to develop a severe form of COVID-19 pneumonia, may have difficulties to follow this recommendation.

Another significant challenge is associated with the current development of clinical trials. The fact that recruitment has been temporary stopped because of the pandemic is only a minor issue compared to the one resulting from the increased risk of death in the cardiovascular population, caused by COVID-19. Since most of the clinical studies in the cardiovascular field have mortality as endpoint, the increased rate of death among cardiovascular patients infected with SARS-CoV-2 virus leads to a major bias that cannot be ignored in the statistical analysis of all clinical trials testing cardiovascular drugs. This could significantly delay the finalization of the trials and

the consequent release of new and effective medications on the market.

Since the end of 2019, many countries have introduced severe measures to restrict the circulation of the population, in an attempt to reduce infection rates. Isolation and social distancing, together with the natural fear and stress of the general population exposed to this devastating disease, may result in serious alteration of the psychological status of cardiovascular patients. This, together with the unavoidable economic impact, will increase the risk of anxiety and depression in the cardiovascular population, which will further augment the risk of acute heart attacks.

Where will all these lead in the post-COVID era? We do not know yet. The cardiology community faces one of the most critical moments of its history, when the life of cardiac patients is at a higher risk than ever. In the current circumstances, we have to dedicate our efforts, time, and resources to identify new drugs, new management models, and new treatment strategies, adapted to a new society that will not be the same.

CONFLICT OF INTEREST

Nothing to declare.

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