Revista Portuguesa de Cardiologia 40 (2021) 929–931

Revista Portuguesa de
Cardiologia
Portuguese Journal of Cardiology
www.revportcardiol.org

EDITORIAL COMMENT

A fresh future forged in fear and failure

Um novo futuro forjado no medo e no fracasso

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Available online 27 October 2021

Early in the Covid-19 pandemic, evidence emerged suggesting that adults with cardiovascular disease (CVD) may be at higher risk of in-hospital mortality from Covid-19. SARS-CoV-19 not only causes viral pneumonia, but also has major implications for the cardiovascular (CV) system. Patients with CV risk factors as well as patients with established CVD are a vulnerable population. Moreover, a considerable proportion of patients may develop cardiac injury in the context of Covid-19, which portends an increased risk of in-hospital mortality.

In the current issue of the Portuguese Journal of Cardiology,[1] Queirós et al. present a retrospective analysis of the experience of a cardiologist team working in a Covid-19 dedicated intensive care unit (ICU) over one month, in the early stage of the pandemic.

The authors report on a cohort of 35 relatively young ICU patients admitted with Covid-19, with a high prevalence of cardiovascular risk factors. These results corroborate previous studies, for which there may be several explanations.[2,3] However, despite having performed echocardiography in all patients, prevalence of heart failure (HF) and cardiovascular disease was relatively low. In this cohort, mortality was 25%, in line with early reported results from the Covid-19 pandemic.[4,5]

Underlying CVD was already associated with a higher risk of severe Covid-19 infection. In a retrospective cohort study of 72 314 cases in China,[4] patients with CV comorbidities had a fivefold higher mortality risk (10.5%). Metra et al.[5] also reported an increased rate of adverse clinical outcomes (57% vs. 21%) among patients with pre-existing cardiac disease. One in three patients with cardiac disease and Covid-19 died in hospital, 2.5 times higher than those without cardiac disease.

Recent evidence from an umbrella review of systematic reviews[6] suggests CVD, hypertension, diabetes, renal disease, and previous smoking are associated with severe Covid-19 and mortality. Current smoking correlates with a higher risk of severe Covid-19, but not mortality; the opposite occurred with obesity.

The higher proportion of adverse outcomes in Covid-19 patients with CVD or cardiovascular risk factors may be due to underlying changes these risk factors have caused on inflammatory pathways, immunity, coagulation and/or lung function.

In this Portuguese study, authors reported high prevalence (62.9%) of myocardial injury and N-terminal pro b-type natriuretic peptide (NT-pro-BNP) levels. Several studies have already shown that biomarkers of myocardial injury (troponin) or stress (NT-pro-BNP) were often elevated in patients with Covid-19 and high baseline levels or their progressive rise identified those more likely to die.[7–9]

Brain natriuretic peptide/NT-pro-BNP are markers of hemodynamic stress and HF and their levels should be seen as the combination of the presence/extent of pre-existing cardiac disease and acute hemodynamic stress related to COVID-19. They are frequently elevated among Covid-19 patients,[8] a result in line with the current paper,

DOI of original article: https://doi.org/10.1016/j.repc.2021.01.011

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https://doi.org/10.1016/j.repc.2021.09.009

where higher NT-pro-BNP levels were associated with higher mortality.

A recently published study[10] showed that myocardial injury was a common finding in Covid-19 patients (32.3%), with acute injury (78.5%) being significantly more common than chronic (21.5%). In this paper, no serial troponin values were obtained, but as the reported rate of previous CVD was low, myocardial injury was probably mainly acute.

The same study also showed that both chronic and acute myocardial injury were strongly associated with impaired survival at six months. Overall, risk of death is similar in patients presenting with acute and chronic myocardial injury, with worse prognosis for acute myocardial injury in younger patients and in those without coronary artery disease, as occurred in this cohort.

Patients with chronic myocardial injury usually have a higher proportion of comorbidities, while acute myocardial injury is associated with a more pronounced inflammatory status, possibly related to ischemic causes but also non-ischemic conditions, such as myocarditis, pulmonary embolism and Takotsubo syndrome.

As many of the conditions and risk factors associated with adverse outcomes in Covid-19 are potentially preventable or modifiable, primary and secondary prevention strategies may improve outcomes for Covid-19 patients.

However, the lessons provided by the Covid-19 pandemic go far beyond the identification of risk factors and disease mechanisms and should trigger a serious reflection on current medical standards and healthcare organization, so that we can improve our practices and patient outcomes.

Here are some thoughts to fuel that reflection.

When we first heard about a new virus spreading from East to West, we were all minding our own business, practicing cardiology as we always had done, full of certainties about our skills and time-proved practices. Suddenly, everything changed: our routines, our hospitals, our confidence, our lives. Everything became disrupted, fragile, strange and unknown.

For the very first time in our lives, we were facing a huge challenge in the form of a virus unlike any other virus we having encountered before, a disease different from the diseases we were used to diagnosing and treating.

There was a sense of urgency in everything about the new pandemic, as every day the number of infections, ICU admissions and fatalities kept climbing, as if nothing we previously knew was of any use in this new and mighty challenge.

After the initial panic and chaos, we gradually came to our senses: it would be a long and difficult battle, different from everything we had experienced before, a battle that, to be successfully overcome, would need us to reinvent ourselves and our practices, the way we think, plan and practice.

As often happens, it is in our darkest hour that we can collectively shine and excel and, in many cases, we did.

One of the first lessons we learned was that we needed to completely rethink our hospitals and hospital circuits, and we moved to the creation of dedicated Covid-19 and non-covid areas, both in our ERs, wards and ICUs. But still, even with these new areas and protocols, cases kept increasing and deaths on the Covid wards and ICUs were dishearteningly high, as if the ways we were practicing medicine no longer worked for these specific patients.

We were forced to understand that Covid-19 was not like any other viral respiratory disease and that Covid-19 patients were not our regular ward or ICU patients. As we observed and studied the disease more closely, we also understood that not all Covid-19 patients were born equal and that they represented a new set of challenges that, to be effectively overcome, needed a radically different approach to just about everything, from the isolation protocols to the ventilation technique.

But, even more important, faced with such overwhelming challenges, we needed a disruptive approach not to the virus, but to the patient. Gradually we learned to practice a new science unknown to many cardiologists and physicians at large: cooperation.

In fact, Covid-19 cannot be effectively treated by intensivists or pneumologists or cardiologists or any other given specialty. Moreover, Covid-19 cannot be effectively treated by any given physician or other healthcare professional. A radical new disease called for a radically different approach, one that combined the expertise of a multidisciplinary team and delivered excelled care to these patients, especially high-risk ones.

When we look to the successful experiences of treating Covid-19 around the world, we always find a common denominator: multidisciplinary teams and cooperation. Perhaps we can add a third key aspect: putting the patient first.

On the subject of multidisciplinary and cooperative work, what we saw was the creation of diverse teams, including physicians, nurses and other healthcare professionals with very different backgrounds, each one contributing with something unique to the collective, that extra something that often makes the difference to the patient. These teams were often very young, with many residents and young specialists, working tirelessly on behalf of the patient, thinking differently, without any rigid boundaries between specialties or professions. In these teams, everyone gave their contribution, taught something, learned something, from each other, the successes and failures, applying that knowledge to the following patients. Often the teams also included valuable contributions from non-healthcare professionals, such as engineers and data scientists who helped to reinvent the ventilation circuits and to advance the knowledge from the growing cohort of patients, just to name a few.

Why cardiologists were often included in these teams has already explained. For many (often very young) that embraced this noble task, it was frequently very challenging but also a fantastic and ''once in a lifetime'' opportunity to broaden horizons on ventilation, mechanical support, multiorgan failure, priority management, end of life management and, dare I say it, humility. The humility to understand that we all know very little compared to what we do not know, to ask for help when we cannot manage everything, to acknowledge weaknesses and overcome them, to accept failures and learn from them.

In this process, we all struggle a lot, but also learn a lot, from patients, their families, from other healthcare and non-healthcare professionals. Many of us found strengths that we did not know we had, weaknesses we were unaware

of and ways to overcome them, found new goals, new challenges, new friends, new doubts, new certainties. Many of us rediscovered the patient, that complex and fascinating entity, the paradigm of the fragility, strength and dignity of the human life, even in the most challenging of circumstances.

In conclusion, we can surely say that the Covid-19 pandemic was and still is a (re)defining moment for each one of us, society, medicine as a whole and cardiology in particular.

More than mourning or cheering all that has happened, it is our duty and our responsibility to make sure that we all learn what has to be learned, change what has to be changed, do what has to be done to make sure that we came out of it wiser, stronger, humbler and more engaged in advancing cardiology, medicine and our communities toward a bright new future!

Conflicts of interest

The author has no conflicts of interest to declare.

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