Lessons Learned by a Multidisciplinary Heart Failure Clinic In The Midst Of A Pandemic

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Abstract

In addition to the deaths caused by coronavirus disease (COVID-19), several countries also observed an increase in the overall number of cardiovascular deaths during the pandemics compared with the same period in previous years. The presence of heart failure (HF) in the context of COVID-19 identifies a subgroup with complex management and may represent both a risk factor for worse infection outcomes and a severe cardiovascular complication caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Patients with advanced HF require regular rigorous multidisciplinary medical follow-up, performed ideally through face-to-face consultation. However, due to the reallocation of health care professionals and the implementation of measures of isolation and social distancing, telemedicine strategies have strengthened as important allies in the management of HF patients. In the present document, we report the brief experience of the unit of advanced HF and heart transplant of Hospital de Messejana, a reference center in the confrontation of COVID-19 in the state of Ceará, Brazil, with the primarily remote monitoring rather than face-to-face consultation from March to July 2020.

Article

One year after the first case of the new coronavirus disease (COVID-19) was reported in Brazil, on February 26, 2020, there has been the alarming record of 10 517 232 cases and almost 255 thousand deaths in the country.¹ In addition to the deaths caused by COVID-19, several countries also observed an increase in the overall number of cardiovascular deaths during the pandemic compared with the same period in previous years. According to a recent study conducted by researchers from Universidade Federal de Minas Gerais, Universidade Federal do Rio de Janeiro, Hospital Alberto Urquiza Wanderley, and the Brazilian Society of Cardiology, the number of cardiovascular deaths increased up to 132% in Brazil during the pandemic.²

Approximately 20 to 30% of patients hospitalized with COVID-19 have some form of myocardial injury, as shown by increased troponin concentrations.³ This group of individuals have worse prognosis, even after adjusting for relevant risk factors and disease severity. Important etiologies of myocardial injury in COVID-19 include myocardial infarction, stress cardiomyopathy, myocarditis, and direct injury by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), in addition to non-cardiac conditions such as pulmonary embolism and sepsis.⁴ The presence of heart failure (HF) in this context identifies a subgroup with complex management and may represent both a risk factor for worse infection outcomes and a severe cardiovascular complication caused by SARS-CoV-2.⁵

In the field of heart transplant, there is also evidence of worse COVID-19 prognosis in transplant recipients,⁶ although this difference was not observed in a small Brazilian case series.⁷ The Committee on Infection in Transplants of the Brazilian Association of Organ Transplants (*Comissão de Infecção em Transplantes da Associação Brasileira de Transplantes de Órgãos*, COINT/ABTO) authorizes the use of all vaccines approved by the Brazil's National Health Surveillance Agency in solid organ transplant recipients; however, there are no data on the efficacy of the vaccines in this population, since immunocompromised individuals were excluded from the existing clinical trials.

According to the recommendations of the Brazilian Guideline on Chronic and Acute Heart Failure, patients with advanced HF require regular rigorous multidisciplinary medical follow-up, performed ideally through face-to-face education, with reinforcements, delivery of written material, and regular follow-up.⁸ However, in view of measures of isolation and social distancing determined by the World Health Organization (WHO), telemedicine strategies, including telemonitoring and virtual consultations, have been strengthened as important allies in the management of HF.^{9,10} In addition to reducing risks of unnecessary exposure to the virus, these programs aid in preventive recommendations, identification of patients at risk for decompensation, diffusion of accurate information through teaching platforms and access to specialists' opinion at remote sites.

Since the beginning of the pandemic, Hospital de Messejana became one of the reference centers in the confrontation of the COVID-19 pandemic in the state of Ceará, Brazil. The increased rate of admissions for COVID-19 throughout 2020 was associated with reallocation of beds directed exclusively to infected patients and also to the emergence of new attributions to health care professionals. Normally, our service of advanced HF and

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Brief Communication

heart transplant has a team comprising six cardiologists, six surgeons, and six nurses, in addition to a multidisciplinary team that includes a psychologist, a social worker, a dietitian, and physical therapists exclusively dedicated to the care of patients with HF and heart transplant. Due to the reallocation of beds and of the team of health care professionals for the care of patients with COVID-19, we implemented a primarily remote follow-up via telephone for patients with HF and transplant patients from March 26 to July 3 2020. This follow-up occurred from Monday to Friday, from 7 a.m. to 1 p.m., and was conducted by two of the six nurses, who worked in rotating shifts. During this period, our nurses performed the follow-up of 361 patients with HF and 143 transplant recipients. For comparative purposes, during the same period of 2019, we had seen 972 patients, with a mean of 322 (standard deviation, 29) patients per month throughout the year. During phone calls, patients were questioned on their clinical status and on treatment adherence, in addition to receiving guidance on non-pharmacological measures such as water and salt restriction, diet, time of medications, among others. If any sign of decompensation was identified, the medical team was then consulted so that due measures were taken. All patients were encouraged to call the outpatient clinic if they had any question or if they experienced any new symptom.

During remote follow-up, we observed a decrease in the proportion of admissions of patients in outpatient follow-up for HF, from 24% in 2019 to 12% in 2020. Conversely, there was a relative increase from 10 to 20% in the hospitalization rate of transplant recipients in outpatient follow-up during the same period. This finding may be explained by the great number of procedures that recent transplant patients have to undergo during the first months and years after transplantation, including endomyocardial biopsies and rescue immunosuppressive therapies, which are unlikely to be performed outside hospital. We did not observe any difference in the percentage of reported deaths between 2019 and 2020; however, when exclusively analyzing individuals who were hospitalized, we found a 2.6-fold increase in the percentage of deaths in 2020, especially among patients with HF, who had an increase from 4% in 2019 to 19% in 2020. We believe that this increased mortality among hospitalized patients may be explained by the prioritization of individuals with more severe disease for hospitalization and, thus, with worse prognosis.

Although telephone follow-up has already been part of the care and research routine in most HF units in Brazil for a long time, this is the first time in more than 20 years that our multidisciplinary team relied primarily on remote monitoring rather than a face-to-face consultation. We believe that the

benefits of telemonitoring cannot be judged only on the basis of its impact on morbidity and mortality rates but should also aim to improve the follow-up of non-pharmacological measures, which involve practice of physical activity, weight loss, and control of water and salt intake. Obviously, there are still many technical barriers for the implementation of other telemedicine services in Ceará, including appropriate internet access (both by health care providers and patients), patients' cognitive capacity to handle the appropriate applications, memory capacity and image quality in older devices etc.

Nevertheless, despite the seriousness of the current context, perspectives with regard to telemedicine in Brazil are positive, since it has become a critical tool in the confrontation of the pandemic and in the enhancement of health service coverage. However, it is worth noting that the telemedicine activity in Brazil was regulated through Law n. 13.989/20 in an exceptional manner, with validity only during the pandemic.^{9,11} Despite that, considering the favorable results in Brazil and worldwide, we believe that the definitive regulation of telemedicine is only a matter of time.

Author Contributions

Conception and design of the research: Vieira JL, Mejia JAC, Souza Neto JD; Acquisition of data: Vieira JL, Sobral MGV, Florêncio RS, Alves VM, Vasconcelos GG, Almeida GPL, Marinho LLE, Fernandes JR, Souza Neto JD; Analysis and interpretation of the data: Vieira JL, Sobral MGV, Florêncio RS; Writing of the manuscript: Vieira JL; Critical revision of the manuscript for intellectual content: Vieira JL, Alves VM, Vasconcelos GG, Almeida GPL, Marinho LLE, Fernandes JR, Mejia JAC, Souza Neto JD.

Ethics approval and consent to participate

This article does not contain any studies with human participants or animals performed by any of the authors.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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Study Association

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