

THE CHANGE IN THE MANAGEMENT OF PATIENTS WITH END-STAGE HEART FAILURE IN THE COVID-19 ERA

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INTRODUCTION

The COVID-19 pandemic had a huge impact on heart failure patients in different ways. First, it was associated with a significant increase in heart failure-related mortality [1]. Second, some authors reported a decreasing trend in heart failure hospitalizations during the first waves of the COVID-19 pandemic [2], which reflects the general inferior access of patients to emergency care departments [2, 3]. This has contributed to a deterioration of the clinical profile of patients referred for acute cardiac emergencies during the pandemic [4]. To date, there is little evidence about the impact of the COVID-19 pandemic on the comprehensive therapeutic management of advanced heart failure.

OBJECTIVES

The primary objective was to determine the treatment options adopted for patients with advanced heart failure before and during the COVID-19 pandemic and detect any change in the two eras. The secondary aim was to evaluate the heart failure-related mortality before and during the pandemic.

METHODS

Using the healthcare utilization databases of Lombardy Region, patients, aged 18 years or older, with the first diagnosis of heart failure from January 2018 to December 2021 were identified.

Patients will be followed from the date of the first heart failure diagnosis until outcomes occurrence or censoring (emigration, death, or December 2021, whichever comes first). A person-level approach was adopted [5].

Exposure was defined as pre-pandemic (before March 2020) and pandemic (after March 2020). High dimensional propensity score (HDPS) [6] was applied to account for possible differences between patients enrolled in the two eras.

Primary outcomes of interest were the utilization of therapies for advanced heart failure as follows: prescription of Sacubitril/Valsartan, implantation of cardiac resynchronization therapy (CRT) or implantable cardioverter-defibrillator (ICD), mechanical circulatory support devices (MCS) and heart transplantation.

Cox regression models were fitted to estimate the hazard ratios (HR) and corresponding 95% confidence intervals (CI) for primary outcomes (treatment strategies) associated with the Covid-19 pandemic, included as a time-dependent variable. Models were adjusted for several demographic and clinical covariates and for HDPS. Since Sacubitril/Valsartan was available in Italy from 2017, it was less prescribed during the first period of follow-up. To account for this trend in prescriptions, the model in this case was adjusted also for calendar time (classified in semesters).

To compare the mortality risk before and during the pandemic, two analyses were performed. First, a Cox regression model was fitted to estimate HR, and 95% CI, associated with the Covid-19 pandemic. Second, cumulative incidence function (CIF) was calculated. Patients enrolled during the pandemic were matched for HDPS to patients enrolled in the pre-pandemic period. Among patients enrolled during the Covid-19 pandemic, mortality was decomposed into a sum of SARS-CoV-2 infection death and other causes. Mortality due to SARS-CoV2 infection was defined as at least a sign of infection in the month preceding death.

RESULTS

36,130 and 17,263 patients had the first diagnosis of heart failure before and during the pandemic era, respectively. Each therapy was used more frequently before the COVID-19 pandemic. Sacubitril/Valsartan was prescribed to 4.2% of patients before the pandemic vs 3.7% during the pandemic. CRT/ICD was implanted in 4.4% and 2.6% of patients before and during the pandemic respectively. Less than 1% of patients in both periods underwent MCSD implantation or heart transplantation.

According to the Cox model, the COVID-19 pandemic was associated with a significant reduction of the utilization of Sacubitril/Valsartan (HR=0.77, 95% CI 0.65–0.91) and implantations of CRT/ICD (HR=0.85, 95% CI 0.78–0.92), but had no significant effect on the probability to receive a MCSD or a transplant.

The COVID-19 pandemic was associated with a 19% increased mortality risk (95% CI: 15%–23%). Among the 17,263 patients enrolled during the pandemic, 11,954 individuals were matched with as many patients enrolled before the pandemic. The overall cumulative incidence of death was higher in patients enrolled during the pandemic compared with those entered in the study before (34% vs 30% at 16 months, respectively). About 5% of patients enrolled during the pandemic died due to the SARS-CoV2 infection in the 16 months following the heart failure diagnosis.

CONCLUSIONS

The COVID-19 pandemic reduced the patient's access to medical and interventional therapeutic options for advanced heart failure, while surgical strategies (MCSD and heart transplantation) resulted unaffected by the pandemic. A 19% increase in mortality risk was registered in the pandemic period for heart failure patients, however further studies are required to define the determinants of this excess of mortality.

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