Case Report

Intermittent Inotrope Infusion Associated with Peritoneal Dialysis for Management of Advanced Heart Failure Secondary to Cardiac Amyloidosis

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Introduction

Advanced heart failure (HF) represents a therapeutic challenge, characterized by quality of life deterioration and multiple hospitalizations. When HF is secondary to cardiac amyloidosis, the recommended treatment for HF may have an unfavorable clinical course. In advanced HF cases, the clinical scenario is even more challenging.

Clinical Case

AOV, a 73-year-old, male patient with a 4-year HF onset along with 2 hospitalizations in the last year and a pacemaker due to atrioventricular block, was referred to a tertiary hospital due to worsening dyspnea within the last week. He was admitted with limiting dyspnea, orthopnea, lower limb edema, and abdominal discomfort. The patient was characterized as decompensated HF, with hemodynamic profile B, along with high-rate atrial fibrillation (AF). Initial exams showed NT-proBNP of 20,669 pg/mL, renal failure (creatinine: 2.1 mg/dL, urea: 68 mg/dL), electrocardiogram with AF, low QRS voltage, and advanced right bundle branch block. Chest radiography showed increased cardiac area, pulmonary congestion, and right pleural effusion. The echocardiogram revealed increased left atrial volume (43 ml/m^2); septum of 24 mm and posterior wall of 23 mm, and ejection fraction was 26% with grade III diastolic dysfunction (E/A = 3.1; E/e' = 14). Due to red flags, after light chain exclusion, the diagnosis of hereditary transthyretin amyloid cardiomyopathy was confirmed (pyrophosphate myocardial scintigraphy with grade 3 uptake and genetic testing showed the Val122Ie genotype). Shortly after discharge and a brief outpatient follow-up, the patient was readmitted to another service for 20 days, but this time due to a decompensated HF profile C, requiring dobutamine and high-doses of intravenous furosemide. Even though the patient was initially considered for heart transplantation, the procedure was discouraged due to comorbidities, age, and social profile. Although he was not eligible for transplantation, the patient presented a challenging scenario, namely, New York Heart Association functional class IV, INTERMACS profile 5, which brought up a discussion on palliative care. In addition to this severe clinical profile, after 2 recent subsequent hospitalizations, the patient required another hospitalization with inotropes that were weaned with levosimendan administration, and cardiorenal syndrome with refractory systemic congestion was managed with peritoneal dialysis. In spite of those treatments, the patient presented another HF decompensation with low output and arterial hypotension, requiring dobutamine infusion and levosimendan administration. Therefore, in order to avoid subsequent episodes of other severe hospitalizations, an outpatient inotropic infusion program was proposed, with the main goal of improving quality of life. Biweekly, the patient received a 6-hour infusion of levosimendan, on day hospital basis, with good safety profile. After this regimen was adopted, the patient did not have any new hospitalizations, and he reported significant improvements in appetite, symptoms, and nutritional aspects, as well as the return to usual activities, especially regarding social life. The patient remained in this biweekly outpatient inotropic infusion program for approximately 1 year without any major complications, until the outcome of sudden death at home.

Discussion

In this report, the HF-associated morbidity was well characterized, which is even more challenging in the scenario of cardiac amyloidosis. For these patients, quality of life should be prioritized throughout the patients' journey, as hospitalization is one of the main indicators of this worsening quality of life.[1]

The approach to advanced HF regarding control of congestive symptoms and management of reduced tissue perfusion has been increasingly discussed, including guidelines supporting both peritoneal dialysis and inotropic infusion as valid strategies for quality of life improvement.[2] A recent meta-analysis of 66 studies concluded that, although there is little evidence for its use in palliative care, inotropic infusion therapy can improve patients' functional capacity without worsening survival.[3]

Moreover, the use of levosimendan, which is an inotrope with hemodynamic (pulmonary and systemic) effects, may have a suitable application for patients, as a periodic outpatient infusion program. In previous studies, repeated use at fortnightly intervals was shown to be safe as well as effective in advanced HF cases, relieving symptoms, reducing hospitalizations, and improving quality of life.[4] In one of

Keywords

Heart Failure; Amyloidosis; Cardiotonic Agents.

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these studies, intermittent infusion of levosimendan showed a significant reduction in acute decompensation and death in the first and third month in the intervention group.[5] In another study, the use of the drug as a 6-hour infusion (0.2 mcg/kg/min), without bolus, every 2 weeks for 12 weeks, was associated with a lower hospitalization risk with similar adverse events when compared to placebo and, importantly, with savings for the health system.[6,7] Furthermore, repeated or intermittent infusion for patients with advanced HF was associated with a reduction in 3-month rehospitalizations; this strategy was considered safe and well tolerated in patients with HF who required inotropes, with remarkable improvements in quality of life and functional capacity.[8] Similarly, in another case report of a patient with wild-type transthyretin cardiac amyloidosis, an inotropic home infusion program was performed for 2 years, with positive impact on quality of life. In this case, the inotropic support strategy was a continuous home infusion of milrinone.[9]

In the reported case, the combined approach of peritoneal dialysis associated with outpatient inotropic infusion led to a significant improvement in the patient's quality of life, without new hospitalizations or safety concerns during the infusions.

Conclusion

The palliative approach to a patient with advanced HF due to cardiac amyloidosis is a therapeutic challenge. In this case, limiting symptoms and multiple hospitalizations were clearly linked to quality of life deterioration. The intermittent outpatient levosimendan infusion along with peritoneal dialysis was a safe and effective strategy, with a significant improvement in the quality of life and a reduction in the risk of hospitalizations without associated adverse events.

Author Contributions

Conception and design of the research, Analysis and interpretation of the data and Writing of the manuscript: Otaviano AP, Eto BTP, Schwartzmann PV; Acquisition of data: Otaviano AP; Critical revision of the manuscript for intellectual content: Schwartzmann PV.

Potential Conflict of Interest

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Ethics approval and consent to participate

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

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