Ambulatory Intravenous Inotropic Support and or Levosimendan in Failing Pediatric and Congenital Heart Disease: Safety, Survival, Improvement or Transplantation

Apostolopoulos S.C., Vagenakis G.A., Tsoutsinos A., Kakava F., Rammos S.
Dept of Ped Cardiology & Adult Congenital Heart Disease, Onassis Cardiac Surgery Center, Athens, Greece

Background
End-stage heart failure (HF) frequently needs continuous inotropic support in hospital and has high morbidity and mortality. It is often treated with mechanical circulatory support or transplantation, both options associated with significant adverse events and not readily available in many countries.

Methods
This is a retrospective analysis of our experience with continuous ambulatory inotropes (AI) and/or periodic levosimendan (LS) infusions in pediatric end-stage HF patients in a tertiary care center focusing on outcome, efficacy and safety of AI and/or LS infusions in HF patients.

Conclusions
- AI and/or LS infusions
  • Feasible, safe, with few complications in pediatric pts with intractable CHF, even in infants
  • Good QoL considering severity of disease
  • Mainstay therapy in absence of transplant option
  • Allows remodeling and possible recovery in myocarditis, which may take up to 1 year
  • Improves PH to allow possible heart transplant
  • Provides time to allow transfer in foreign Pediatric Transplant Program or allow growth to permit transplant in Adult Transplant Program

Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No (%)</th>
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<tbody>
<tr>
<td>Patients</td>
<td>27</td>
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<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>16 (59%)</td>
</tr>
<tr>
<td>Female</td>
<td>11 (41%)</td>
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<tr>
<td>Age at initiation of therapy</td>
<td>9.4 (0.1-26.1) years</td>
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<td>NYHA Class at initiation of therapy</td>
<td>III-IV</td>
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<td>NT-proBNP at initiation of therapy</td>
<td>2542 (320-16166) pg/ml</td>
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<td>Inotropic therapy</td>
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<td>AI alone</td>
<td>7 (26%)</td>
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<td>LS alone</td>
<td>6 (22%)</td>
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<td>Combined AI and LS</td>
<td>14 (52%)</td>
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Diagnoses

- Myocarditis: 48%
- Dilated CM: 22%
- Restrictive CM: 8%
- CHD: 22%

Results – Summary (27 pts)
- Median F/U 2.1 (0.3-21.3) years
- 4 pts (2 DCM, 2 RCM): prolonged hosp and death after 0.8-2.1 years (mortality 15%)
- 6 pts (22%): heart transplantation after 0.3-2.3 years
- 17 pts stable for 4mos to 3.4 yrs
- WHO class I-II, good QoL, good social life, attending school, playground
- AI weaned and discontinued in
  - 6 improved myocarditis pts after 1.2 (0.4-2.3) yrs
  - 2 CM pts after 0.7 and 3.7 years (still on LS infusions)
  - 1 CM pt with LVAD still waiting for Tx 2.5 yrs since.

Complications – Safety
- 4 line infections, in 3 patients (only 1 catheter removal and reinsertion)
- 4 catheter dislodgements in infants → reinsertion
- No reports of pump malfunction or emergent hospital admissions apart from the line infections
- No neurologic, bleeding or thromboembolic events
- No sudden deaths, no defibrillator discharge

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Conflict of interest: none declared