

Intermittent Milrinone and Beta Blocker Therapy: Hemodynamic (BioZ.com®) Indicators of Successful Weaning from Inotropes

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Background

Intermittent milrinone therapy has been used to improve symptoms in patients with decompensated heart failure and may ameliorate symptoms of worsening heart failure during beta blocker titration. We previously reported an 88% success rate in titrating carvedilol in 25 CHF patients stabilized on intermittent milrinone infusion.

Of the patients who were on Milrinone during Carvedilol titration, 53% were weaned off of Milrinone in an average of 8.4+ / -8.4 weeks after full Carvedilol dose was achieved. Noninvasive hemodynamic monitoring (BioZ.com) was prospectively obtained in a sub-set (12) of these patients.

Objective

To determine the hemodynamic predictors of successful weaning from Milrinone after Carvedilol titration.

Methods

- All patients were maximized on ACE inhibitors and diuretics.
- Beta blockers were titrated to maximum doses on milrinone.
- Weaning from milrinone was attempted on all patients.
- Noninvasive monitoring was done for a period of 5 minutes on two successive pre-weaning visits to outpatient heart failure clinic after beta blocker titration.
- Hemodynamic data was obtained using BioZ.com (CardioDynamics Inc.).
- The BioZ.com systems use the baseline and changes in impedance to measure and calculate hemodynamic parameters.
- Failures were defined as hospitalizations or worsening CHF within 60 days of weaning.

- Patients were divided in two groups based on the success of weaning.
- Data was analyzed using independent samples t-test for significant differences.

Results

There were a total of 6 patient each in 'successful weaning' group and 'failed weaning' group. All data is expressed in mean \pm standard error mean.

A p-value of less than 0.05 was considered significant.

	Weaning Failure (N=6)	Successful Weaning (N=6)	p-value
Mean Age (years)	58 (62-79)	61 (59-81)	
Sex (Male/Female)	3/3	5/1	
Etiology of CHF (Ischemia/ Non-ischemic)	6/0	5/1	
Heart Rate (HR) beats/min	79.5 \pm 1.03	64.5 \pm 1.17	<0.01
Cardiac Index (CI) L/min/m ²	2.6 \pm 0.06	2.5 \pm 0.04	0.31
Systemic Vascular Resistance Index (SVRI) Dynes cm-5 m ²	2246 \pm 79	2690 \pm 68	<0.01
Mean Blood Pressure mm of Hg	86 \pm 2.0	89 \pm 2.8	<0.01
Left Cardiac Work Index (LCWI) Kg.m/m ²	2.4 \pm 0.06	2.9 \pm 0.08	<0.01

Conclusions

- Patients who fail weaning have significantly higher HR, lower SVRI & mean blood pressures.
- LCWI below 2.5 kg.m/m² predicted all failures.
- Noninvasive hemodynamic monitoring using BioZ.com may be useful in tailoring weaning protocol for individual patients and in selecting patients who can be successfully discontinued from intermittent inotropic infusion therapy.