

**Intravenous beta1-receptor blocking medication as a rescue treatment for severe postoperative myocardial diastolic dysfunction in infants**

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**Background:**

Diastolic left ventricular myocardial dysfunction follows surgical repair of critical neonatal congenital heart defects despite successful initial treatment in some patients. Low cardiac output states present in many such patients lead to high levels of catecholamines with concomitant tachycardia and increased postoperative morbidity. We have used intravenous infusion of esmolol to lower heart rate and facilitate postoperative recovery in this setting.

**Case reports:**

Case A: term neonate with critical aortic stenosis and endocardial fibroelastosis who underwent emergency balloon aortic valvuloplasty at 2 days of age followed by Ross-Konno procedure at 2 month. One month later he still required artificial ventilation and at cardiac catheterisation left ventricular end-diastolic pressure was 24mmHg. Continuous infusion of esmolol was added to digoxin and milrinone reducing heart rate from 180 to 110bpm. He was successfully extubated 3 days later.

Case B: premature neonate with hydrops and critical aortic stenosis who underwent surgical aortic valvuloplasty at 2 month of age. She remained ventilator dependent with evidence of normal left ventricular systolic function but persistent diastolic dysfunction. Continuous infusion of esmolol was added to enoximone reducing heart rate from 180 to 120bpm. Ventilation was successfully weaned 4 days later.

Case C: preterm neonate who underwent anatomic repair of transposition of the great arteries complicated by apical left ventricular ischaemia and systolic and diastolic dysfunction. Systolic myocardial function gradually recovered but severe diastolic dysfunction persisted and the patient has been dependent on artificial ventilation for 10 weeks postoperatively. Intravenous esmolol infusion was added to enoximone and captopril treatment followed by reduction in heart rate from 150 to 115 bpm and weaning from positive pressure ventilation in 3 days.

**Conclusion:**

Benefit of lowering heart rate in acute or chronic myocardial dysfunction has been well recognised in adult patients with favourable impact of beta-receptor blocking medication for several decades now. Our limited data show that the use of intravenous selective beta1-receptor blocker facilitates postoperative recovery in infants with persistent tachycardia and severe left ventricular diastolic dysfunction following cardiac surgery.