Milrinone & Amrinone: Cardiac Effects

Anesthetic Pearls: The Anesthetic Implications and Management of Milrinone & Amrinone

Milrinone & **Amrinone** are **phosphodiesterase-III inhibitors**. Their use results in increased cAMP levels independent of Beta-adrenergic pathways. PDE-III inhibitors are potentially synergistic with Beta-agonists in increasing cAMP levels. Effects are not blocked by Beta-blockers or depletion of norepinephrine. These drugs may be important in patients with down regulation of Beta-receptors. Both drugs are used in the management of heart failure when conventional treatment with vasodilators and diuretics prove insufficient.

PDE-III inhibitors are often termed "**Inodilators**":

Inotropic- positive inotropic effect secondary to increased cAMP results in ↑ cardiac intracellular Ca^{2+}

Vasodilation- direct venous & arterial dilation secondary to increased cAMP results in ↓ endothelial / vascular intracellular Ca^{2+}

Similar hemodynamic & pharmacologic effects:

1. ↑ Cardiac Index (30-100%)
2. ↓ PCWP (15-50%)
3. ↓ SVR (20-40%)
4. ↓ PVR (25-50%)
5. HR & BP generally unchanged
6. No increase MV02 (myocardial oxygen consumption) secondary to decreased wall tension
7. Clearance decreased in CHF

AMRINONE

- Loading dose: 1.5 mg/kg (0.75-2.0 mg/kg)
- Infusion rate: 10 mcg/kg/min
- Terminal 1/2 life: 2.6 hrs -> healthy; (5.8 hrs -> CHF)
- **Load SLOWLY** secondary to vasodilation
- Thrombocytopenia (2-3%)
- GI upset, fever, hepatic dysfunction, ventricular irritability reported
- Contains metabisulfite: contraindicated with allergy to bisulfites

MILRINONE

- **15-30 times more potent than Amrinone**
- Loading dose 50 mcg/kg
- Infusion rate 0.375 - 0.75 mcg/kg/min
- **Load SLOWLY** secondary to vasodilation
- Significantly ↓ **PVR** (good for RV dysfunction and pulmonary HTN)
- Chronic administration appears to "increase" mortality (unknown etiology)
- Arrhythmogenic potential