
Subject: Norepinephrine Plus Milrinone in Septic Shock
Posted by [diegovinciguerra](#) on Thu, 17 Jul 2008 00:14:58 GMT
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Is there any case where the combination of norepinephrine and milrinone is effective in the treatment of septic shock.?

Subject: Re: Norepinephrine Plus Milrinone in Septic Shock
Posted by [cvalverdeg](#) on Wed, 26 Nov 2008 13:57:24 GMT
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Hi
We have used lots of times and seems to work in some patients. Specially when you have both, low vascular resistance and low cardiac output.

Cristian

Subject: Re: Norepinephrine Plus Milrinone in Septic Shock
Posted by [krokodil](#) on Mon, 03 Aug 2009 13:18:44 GMT
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phosphodiesterase inhibitors(milrinone and enoximone) have been tried successfully in severe sepsis in children. See attached literature links and abstracts below.
CHEST May 1996 vol. 109 no. 5 1302-1312, *Pediatr Crit Care Med.* 2003 Oct;4(4):471-5. ,

CHEST May 1996 vol. 109 no. 5 1302-1312
Hemodynamic Effects of IV Milrinone Lactate in Pediatric Patients With Septic Shock
A Prospective, Double-Blinded, Randomized, Placebo-Controlled, Interventional Study
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Abstract

Study objective: To determine the hemodynamic effects of IV milrinone lactate in pediatric patients with nonhyperdynamic septic shock. Specifically we tested the hypothesis that IV milrinone would increase cardiac index by 20% and decrease systemic vascular resistance index by 20% during a 2-h study period.

Design: Prospective, double-blinded, randomized, placebo-controlled, descriptive, interventional study.

Setting: Twenty-six-bed pediatric ICU at Children's Medical Center of Dallas and a 10-bed pediatric trauma ICU at Parkland Memorial Hospital.

Patients/participants: Twelve patients (age range, 9 months to 15 years) with nonhyperdynamic septic shock despite administration of catecholamines (cardiac index [CI] normal [3.5 to 5.5 L/min/m²] or low [3.5 L/min/m²]; systemic vascular resistance index [SVRI] normal [800 to 1,600 dyne-s-cm⁵/m²] or high [1,600 dyne-s-cm⁵/m²]; and pulmonary capillary wedge pressure [PCWP] normal [8 to 12 mm Hg] or higher) with clinical signs of poor perfusion were enrolled, randomized, and treated in a blinded fashion with IV milrinone and placebo.

Interventions: Patients were randomized into two groups. Group A received a loading dose of 50 µg/kg IV of milrinone followed by a continuous IV infusion of 0.5 µg/kg/min while group B received an equal volume loading dose and continuous infusion of placebo. After 2 h, group A received an equal-volume loading dose followed by a continuous infusion of placebo while the milrinone infusion continued, while group B received a 50 µg/kg loading dose of milrinone followed by a continuous infusion of 0.5 µg/kg/min while the placebo infusion remained. Outcome variables were measured at baseline, 0.5, 1.0, 2.0, 2.5, 3.0, and 4.0 h. Echocardiographic measurements were taken at baseline, hour 2, and hour 4 in all subjects. No changes in other inotropic or mechanical ventilatory support were allowed during the study period.

Measurements and main results: Milrinone significantly increased CI, stroke volume index (SVI), right and left ventricular stroke work index, and oxygen delivery (DO₂) at 0.5, 1.0, and 2.0 h postloading dose (p<0.05) while significantly decreasing SVRI, pulmonary vascular resistance index, and mean pulmonary arterial pressure at 0.5, 1.0, and 2.0 h postloading dose (p<0.05). No clinically or statistically significant changes in heart rate, systolic and diastolic BP, mean systemic arterial pressure, or PCWP were observed during milrinone treatment compared to placebo.

Conclusions: CI, SVI, and DO2 significantly increased while SVRI significantly decreased when compared to placebo after IV administration of milrinone to pediatric patients with nonhyperdynamic septic shock. No adverse effects were observed. In a volume-resuscitated pediatric patient with septic shock, when administered in addition to catecholamines, milrinone will improve cardiovascular function.

Pediatr Crit Care Med. 2003 Oct;4(4):471-5.

Cardiac rescue with enoximone in volume and catecholamine refractory septic shock. Ringe HI, Varnholt V, Gaedicke G.

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In December 2000 and February 2001, two children with suspected meningococcal disease were admitted to our pediatric intensive unit. Their Glasgow Meningococcal Septicaemia Prognostic score was 12 points. General treatment including antibiotics, steroids in case of meningitis, and fluid replacement, was performed. Despite appropriate volume replacement, intubation and ventilation, noradrenaline and adrenaline continuous infusions ≤ 1.0 microg/kg/min, and additional bolus infusions, cardiac output deteriorated within minutes in both children. Calcium and bicarbonate were given without sustained effect. Echocardiography demonstrated no pericardial effusion and shortening fraction was $< 10\%$. External cardiac massage had to be performed immediately in one case for electromechanical uncoupling. Both patients received a bolus of enoximone 2 mg/kg and 5 mg/kg body weight, respectively, followed by a continuous infusion of 20-23 microg/kg/min. Thereafter, both children had an adequate blood pressure and their shortening fraction increased to $> 30\%$. Within minutes, the catecholamine infusion could be reduced in both patients. The children completely recovered from their life-threatening situations. In patients with severe prolonged catecholamine and volume refractory endotoxin shock in Waterhouse-Friderichsen syndrome, even with electromechanical uncoupling and complete myocardial arrest, enoximone can immediately restore myocardial contractility.

Subject: Re: Norepinephrine Plus Milrinone in Septic Shock
Posted by [cvalverde](#) on Mon, 03 Aug 2009 19:33:41 GMT
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Any experiences using USCOM in sepsis?

We have used in few patients, but I'm not really convinced
