

**MAGNESIUM SUPPLEMENTATION REDUCES  
POSTOPERATIVE ARRHYTHMIAS AFTER  
CARDIOPULMONARY BYPASS IN  
PEDIATRICS**

**CICU**

# OBJECTIVES

- Postoperative arrhythmias (POA) are an important cause of morbidity and mortality.
- Postoperative junctional ectopic tachycardia (JET) remains one of the most common arrhythmias (8%–20%).
- JET is associated with hemodynamic instability.

# OBJECTIVES

- Magnesium is an essential cofactor for the maintenance of myocardial transmembrane potential, magnesium deficiency decreases the threshold for arrhythmias.
- The various causes of hypomagnesaemia: large volume of CPB prime solution, blood transfusion, administration of large doses of calcium and diuretics...

## STUDIES

- 1 RCT ( Dorman BH – Cochrane 2000) 28 pediatric pts to receive IV magnesium (magnesium group, n = 13; 30 mg/kg) or saline (placebo group, n = 15) immediately after cessation of CPB.
- Results: in the placebo group, 27% JET developed in the ICU. No JET was observed in the magnesium group (P =0.026).

# STUDIES

- 1 RCT( Manrique AM – Cochrane 2010) 99 pts 3 groups: group 1, placebo (29 pts); group 2, 25 mg/kg of MgSO<sub>4</sub> (30 pts); and group 3, 50 mg/kg of MgSO<sub>4</sub> (40 pts). They were administered during the rewarming phase of CPB.
- Results: Pts receiving placebo (group 1) significantly greater occurrence of JET than groups receiving MgSO<sub>4</sub> (group 1, n = 5 [17.9%]; group 2, n = 2 [6.7%]; group 3, n = 0 [0%],  $P = 0.009$ ).

## STUDIES

- 1 meta-analysis of RCTs ( Toshiya Shiga – Am J Med 2004) 17 RCTs (n= 2069 pts). Magnesium supplementation reduced the risk of supraventricular arrhythmias ( RR=0.77, 95% CI: 0.63-0.93, P=0.002), and ventricular arrhythmias ( RR=0.52, 95% CI: 0.31-0.87, P< 0.0001).

## STUDIES

- 1 meta-analysis of RCTs ( Lee HY – Pediatr Cardiol 2013) 121 potentially relevant studies, 5 RCTs (n=348 pts). Magnesium supplementation decreased the incidence of arrhythmias after CPB (RR= 0.34; 95% CI: 0.18 - 0.65; P = 0.001), with no heterogeneity between trials.

# GUIDELINES

- Recommended that all pts with increased risk of POA (infants having undergone repair of TOF, VSD, TGA, AVSD...) be given 50mg/kg Magnesium sulfate immediately after CPB.

## CONCLUSIONS

- Giving magnesium sulfate immediately after CPB is effective in the prophylaxis of POA, especially for JET.

**THANK FOR YOUR ATTENTION**

