Magnesium moderately decreases remifentanil dosage required for pain management after cardiac surgery.


Division of Cardiothoracic and Vascular Anaesthesia and Intensive Care, University Hospital, Waehringer Guertel 18-20, A-1090 Vienna, Austria.

BACKGROUND: Magnesium is a calcium and an NMDA-receptor antagonist and can modify important mechanisms of nociception. We evaluated the co-analgesic effect of magnesium in the postoperative setting after on-pump cardiac surgery.

METHODS: Forty patients randomly received either magnesium gluconate as an i.v. bolus of 0.21 mmol kg\(^{-1}\) (86.5 mg kg\(^{-1}\)) followed by a continuous infusion of 0.03 mmol\(^{-1}\) kg\(^{-1}\) h\(^{-1}\) (13.8 mg kg\(^{-1}\) h\(^{-1}\)) or placebo for 12 h after tracheal extubation. After surgery, remifentanil was decreased to 0.05 microg kg\(^{-1}\) min\(^{-1}\) and titrated according to a pain intensity score (PIS, range 1-6) in the intubated, awake patient and a VAS scale (range 1-100) after extubation. If PIS was > or =3 or VAS > or =30, the infusion was increased by 0.01 microg kg\(^{-1}\) min\(^{-1}\); if ventilatory frequency was < or =10 min\(^{-1}\) it was decreased by the same magnitude.

RESULTS: Magnesium lowered the cumulative remifentanil requirement after surgery (P<0.05). PIS > or =3 was more frequent in the placebo group (P<0.05). Despite increased remifentanil demand, VAS scores were also higher in the placebo group at 8 (2 vs 8) and 9 h after extubation (2 vs 7) (P<0.05). Dose reductions attributable to a ventilatory frequency < or =10 min\(^{-1}\) occurred more often in the magnesium group (17 vs 6; P<0.05). However, time to tracheal extubation was not prolonged.

CONCLUSIONS: Magnesium gluconate moderately reduced the remifentanil consumption without serious side-effects. The opioid-sparing effect of magnesium may be greater at higher pain intensities and with increased dosages.

PMID: 16490760