

TITLE: MAGNESIUM INHIBITS THE α_1 - BUT NOT THE β_1 -ADRENERGIC ACTIONS OF EPINEPHRINE IN POSTOPERATIVE CORONARY ARTERY BYPASS GRAFT (CABG) PATIENTS

AUTHORS: RC Prielipp, MD, GP Zaloga, MD, JF Butterworth, MD, PG Robertie, MD, RL Royster, MD
AFFILIATION: Department of Anesthesia, Wake Forest University Medical Center, Winston-Salem, NC 27103

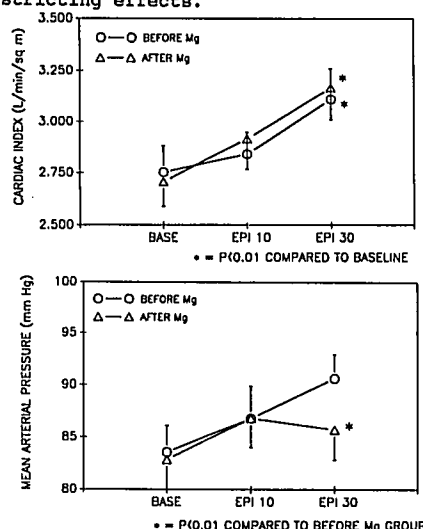
INTRODUCTION: Decreased serum Mg after CABG surgery is associated with arrhythmias, for which IV Mg is recommended. These patients often simultaneously require inotropes (eg, epinephrine (EPI)). However, Mg is a nonspecific Ca^{2+} -channel blocker and may elicit negative inotropic effects. We hypothesized that Mg would attenuate EPI's actions.

METHODS: After IRB approval, 11 consenting CABG patients were studied on their first postoperative day. Patients were extubated and did not require inotropic or antihypertensive therapy. Standard hemodynamic measurements were performed: cardiac output (CO) was determined by thermodilution. EPI was infused at 10 and 30 ng/kg/min and measurements taken after 8 min at each rate. EPI was discontinued, and a second baseline obtained 15 min later. Next, Mg was administered (7 mg/kg of $MgSO_4$ over 5 min as a bolus followed by 10 mg/kg/hr as continuous infusion). Measurements were obtained 10 and 20 min later. Lastly, EPI infusions were repeated and measurements recorded. Results are reported as means \pm SEM. Differences were determined by ANOVA and Scheffé's test. $P < 0.05$ was significant.

RESULTS: Mg bolus significantly increased levels by

34%. Mg infusion alone did not alter cardiac index (CI) or MAP. EPI at 30 ng/kg/min significantly increased CI both before and after Mg (upper figure). Mg infusion significantly diminished EPI's effect on MAP (lower figure).

CONCLUSIONS: Mg alone does not affect hemodynamics. Mg does not inhibit the cardiogenic actions of EPI. However, Mg significantly decreased EPI's peripheral vasoconstricting effects.



TITLE: THE RATE OF ENTERAL FEEDING IS IMPORTANT FOR GUT MAINTENANCE

AUTHORS: GP Zaloga, MD, RC Prielipp, MD, KA Ward, LAT

AFFILIATION: Department of Anesthesia, Wake Forest University Medical Center, Winston-Salem, NC 27103

INTRODUCTION: Recent evidence implicates toxin and bacterial translocation through the gut as a common cause of sepsis and multiple organ failure in surgical patients. Since enteral feeding is an important stimulus for gut growth, many clinicians administer enteral feedings at low rates to stimulate the gut following surgery. However, the efficacy of low-rate enteral feeding for gut maintenance is untested. We compared different rates of enteral feeding for maintenance of gut mass in animals after abdominal surgery.

METHODS: After institutional approval, anesthetized male Sprague Dawley rats (250-300 g) had gastroduodenal feeding tubes placed and their guts exposed to air for 30 minutes. Animals were randomized to ad lib rat chow (ALRC; n=4), low-rate liquid enteral feeding (LREF, n=4), or high-rate enteral feeding (HREF, n=5). Five control animals received no surgery. All animals were weighed daily, fed for 5 days, then sacrificed and the mucosal protein content of their proximal, mid, and distal small intestine measured. Data are presented as mean \pm SEM and were analyzed by ANOVA and Tukey's multiple comparison test. $P < 0.05$ was significant (*).

RESULTS: Control animals gained 12% of their initial total body weight. After surgery, ALRC animals lost 9% of initial body weight, LREF lost 12%, and HREF lost 11%. Average caloric intake (cal/day) was 107 in controls, 70 in HREF, 30 in LREF, and 25 in ALRC. Average daily protein intake (g/day) was 5 in controls, 3.1 in HREF, 1.3 in LREF, and 1.3 in ALRC. Protein contents of the small intestine are shown below. The HREF group maintained higher mucosal mass than the LREF or ALRC group (Figure).

DISCUSSION: The rate of enteral feeding is an important factor in the maintenance of gut mass following surgery. Rates of feeding which deliver 30% of calories resulted in significant gut atrophy whereas feedings delivering 70% of calories maintained gut mass. Surprisingly, the HREF maintained normal small bowel mass despite significant weight loss. Our data suggest that LREF is ineffective in preventing gut loss after abdominal surgery.

