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Effect of low-dose ketamine regimen with or without magnesium sulphate adjunct in tramadol patient controlled analgesia in a major abdominal surgery ICU population

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Introduction We evaluated the potential benefits of adding magnesium sulphate (MgSO4) to ketamine (K) in a patient controlled analgesia (PCA) model with tramadol (T) on postoperative pain and cognitive function in major abdominal surgery.

Methods Twenty-four abdominal open surgery patients were included in a double-blind, randomized study. After extubation a PCA pump with T was placed to promote optimal analgesia. In the first group K was added (0.5 mg/ml) to the pump (Gk, n = 6), in the second group it was MgSO4 (0.03 mg/ml) (Gm, n = 6), in the third group MgSO4 was adjunct to K (Gm-k, n = 6) and in the last group NaCl 0.9% was added and served as the control group (Gc, n = 6). Consumption of T and the cognition (using the Mini-Mental State of Examination (MMSE) [1]) were evaluated at the end of hospitalisation in the ICU. For statistical analysis, a Shapiro–Wilk test, Wilcoxon test and Student test were used.

Results K and MgSO4, separately added to T, did not improve significantly its global consumption, demonstrating comparable postoperative pain scales between groups (P = 0.08). MgSO4 coupled with K (Gm-k) improved postoperative pain compared with Gc (P <0.05). This combination reduced the mean global T consumption by 15% (±5% SD) during the first 24 hours and by 25% (±8% SD) during the second day of pump infusion compared with the other groups (P <0.02). K and MgSO4 did not modify cognitive functioning compared with the control group (mean MMSE scoring: >28 ± 2, SD) (P = 0.1).

Conclusions Adding a low dose of K or MgSO4 to T in postoperative major abdominal surgery did not improve analgesia but the combination of both had a statistically sparing effect on T consumption. Magnesium plays a determinant role, by interacting in the glutaminergic pathways, on the K effect. Cognitive determinants in ICU patients are not modified by a low dose of K.

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Impact of ketamine on dynamic compliance and airway resistance of sedated and mechanically ventilated ICU patients

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Introduction Little is known about the potential hemodynamic benefits of continuous ketamine sedation and analgesia in adult ICU patients.

Methods In a pilot multicenter, prospective, double-blind, randomized control trial, we screened 66 adult ICU patients who required sedation and analgesia. Patients meeting entry criteria were randomized to continuous infusion of ketamine (study) or fentanyl (control) for >24 hours to achieve a Ramsay Sedation Scale of 4. We recorded lung compliance and airway resistance. Sixty percent of patients (3/5) received ketamine with low-dose midazolam for 24 hours followed by midazolam only and 40% (2/5) received fentanyl. We measured dynamic compliance and airway resistance for both groups before sedative infusion and every 4 hours thereafter.

Results There was a statistically significant increase in the dynamic compliance in the study group compared with the control group (P <0.05). There was a statistically significant decrease in the airway resistance in the study group compared with the control group (Figure 1).

Conclusions This preliminary report illustrates the possible value of ketamine for continuous ICU sedation and analgesia.

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Etomidate versus ketamine for rapid sequence intubation in acutely ill patients: a multicenter randomized controlled trial

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Introduction Critically ill patients often require emergency intubation with administration of etomidate as the sedative agent. The use of etomidate has been challenged as it causes a reversible adrenal insufficiency probably leading to an increase in hospital morbidity.

Methods In this prospective, randomized, controlled, single-blind trial, we assigned 234 patients to receive 0.3 mg/kg ketamine and 235 patients to receive 2 mg/kg etomidate for intubation. The primary endpoint was the maximum value of the Sequential Organ Failure Assessment score (SOFAmax) during the first inhospital 3 days. (ClinicalTrials.gov number, NCT00440102.)

Results The mean SOFAmax score between the two groups was not significantly different (10.3 ± 3.7 for etomidate vs. 9.6 ± 3.9 for ketamine; P = 0.056). There was no significant difference in 28-day mortality (81 (35%) deaths vs. 72 (31%) deaths, P = 0.36), the number of patients needing catecholamine (137 (59%) patients vs. 120 (51%) patients, P = 0.10), median (IQR) ventilator-free days (12 (0 to 25) days vs. 15 (0 to 26) days, P = 0.36) and median (IQR) hospital-free days (4 (0 to 22) days vs. 6 (0 to 23) days, P = 0.57). Adrenal insufficiency incidence was significantly higher in etomidate than ketamine group (86% vs. 48%, P <0.001).

There was no significant difference between the two groups in intubation conditions. There was no significant difference in outcome between the etomidate and ketamine groups on prespecified subgroup analysis (trauma or sepsis patients).