

# Best of Meeting Abstract

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### Small dose ketamine 0.5mg/kg produces a peripheral preventive analgesic effect when added to interscalene block for major shoulder surgery.

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**Introduction:** Ketamine is a novel anesthetic agent and NMDA antagonist which has been shown to have local anesthetic properties (1). Tverskoy et al (2) showed in humans that the enhancement of the local anesthetic and analgesic effects of bupivacaine cannot be explained by a central action of ketamine, and therefore this effect is most likely peripheral in its origin.

This randomized double-blind study was performed to examine the potential peripheral analgesic action of ketamine when given with ropivacaine for interscalene brachial plexus block (ISBPB) before major shoulder surgery. The potential central or peripherally mediated preventive analgesic effect of ketamine was also evaluated.

**Methods:** After REB approval and informed consent 30 patients were recruited and randomized to either interscalene block with ropivacaine 25mg (ISC) +ketamine 0.5mg/kg + placebo i.v. injection (group 1), ISC+IV ketamine 0.5mg/kg (group 2) or ISC +IV saline (group 3). Patients were then anesthetized using a standardised technique for open shoulder surgery.

Pain (VAS), time to first analgesic request and analgesic consumption (PCA morphine) were monitored until 9am on the first postoperative day.

Statistical analysis was performed using SPSS version 10.0. Categorical data were analyzed using Chi Squared test and continuous data was analyzed by Mann-Whitney test or ANOVA followed by Scheffe's post-hoc test.  $P < 0.05$  is considered statistically significant. Data are presented as mean  $\pm$  sd.

**Results:** There were 10 subjects in each group. There was no significant difference among the groups in terms of age, sex, weight,

ASA status, surgical procedure or surgical time. There was no significant differences among groups in terms of intraoperative medications such as midazolam, fentanyl or rocuronium. Propofol consumption was significantly lower ( $p < 0.05$ ) in group 1 ( $165 \pm 43$  mg) compared with group 2 ( $201 \pm 3$  mg) and group 3 ( $204 \pm 27$ mg). There were no significant differences in postoperative VAS scores at rest or on movement, time to first analgesia or ketamine related adverse effects. PCA morphine consumption between arrival in PACU and 8h postoperatively did not differ significantly among the groups. However, ANOVA showed that PCA morphine consumption from 8h postoperatively to the following morning at 09:00 was significantly ( $p < 0.02$ ) lower in group 1 ( $10.6 \pm 10.0$  mg) compared with group 3 ( $27.1 \pm 14.7$  mg) but not group 2 ( $16.1 \pm 11.9$  mg).

**Conclusions:** The results of this study confirm the suggestion that ketamine has a peripheral preventive analgesic effect since adding ketamine to interscalene ropivacaine (group 1) resulted in significantly less morphine consumption in the late postoperative period compared with the placebo group (group 3). In contrast, morphine consumption in the intravenous group (group 2) did not differ significantly from that of the placebo group or the interscalene group. The preventive effect is demonstrated by the finding of a PCA morphine-sparing effect that became evident only after the effects of the ketamine had worn off (i.e., after between 8h postoperatively and the following morning).

#### References:

1. Dowdy EG, Kaya K, Gocho Y. Some pharmacologic similarities of ketamine, lidocaine, and procaine. *Anesth Analg* 1973; 52: 839-842.
2. Tverskoy M, Oren M, Vaskovich M, Dashkovsky I, Kissin I. Ketamine enhances local anesthetic and analgesic effects of bupivacaine by peripheral mechanism: a study in postoperative patients. *Neurosci Lett* 1996; 215: 5-8.