SESSION III

Title: EFFECT OF EPINEPHRINE ON INTRATHECAL FENTANYL ANALGESIA

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Introduction: Epinephrine has been reported to improve the intensity and duration of epidural opioid analgesia.[1,2] The proposed mechanism of this effect is thought to be reduced vascular absorption of the opioid secondary to epinephrine induced vasoconstriction. The effects of epinephrine on intrathecal opioid analgesia in humans are not known. This study was designed to determine the effect of epinephrine on the quality of intrathecal fentanyl analgesia in postoperative patients.

Methods: After informed consent to an institutionally approved protocol, 30 unpremedicated ASA I or II patients for postpartum bilateral partial salpingectomy under spinal anesthesia were randomly assigned in a double blind fashion to receive 5% lidocaine/$D_{7.5}W$ (70 mg) alone (L) or with fentanyl 10 mcg (LF), fentanyl 10 mcg + epinephrine 0.2 mg (LFE) or epinephrine 0.2 mg only (LE). The total volume was adjusted to 1.8 ml with normal saline. Spinal anesthesia was induced in the right lateral decubitus (27) or sitting position (3) after acute intravenous hydration with 750 ml crystalloid. Sensory level to pinprick and motor function (Bromage 1-4) were measured by a blinded observer at 1, 2, 3, 4, 5, 10 and 15 minutes (after induction of anesthesia) and every 15 minutes. The quality of intraoperative analgesia, blood pressure and degree of pruritis were recorded at the same time. A zero to 10 cm linear visual analog pain score was recorded every 15 minutes postoperatively. The time to first narcotic request (TFN) and 24 hour analgesic requirement were recorded. Twenty-four hour morphine equivalents were calculated. Vasopressor dosage was recorded intraoperatively. Data was subjected to analysis of variance. A p value less than 0.05 was considered significant.

Results: There were no differences in time to maximum pinprick level, intraoperative quality of anesthesia, 2 segment regression time, TFN, 24 hr morphine equivalents, incidence of pruritis, hypotension, ephedrine usage in any of our patient groups. All times are given in minutes ± SD. The duration of zero pain score (DURO) was significantly longer in those patients who had received LFE (140 ± 51) than in patients with L (68 ± 49) or LE (65 ± 44). There was no difference in DURO between the LF (77 ± 41) and the L (68 ± 49) group. (See figure 1)

Sacral regression was prolonged in the LFE group (253 ± 46) compared to the L (135 ± 41) and LF (145 ± 47) groups.

Discussion: The addition of fentanyl 10 mcg (Group LF) or epinephrine 0.2 mg (Group LE) to lidocaine did not prolong the duration of analgesia in this patient population. The addition of both epinephrine and fentanyl did significantly prolong the analgesia obtained. Perhaps the fentanyl alone is so rapidly absorbed that it does not give analgesia beyond that given by the lidocaine. When epinephrine is added, it delays absorption and the fentanyl analgesia becomes apparent. Alternatively as seen in animals,[3] there may be an interaction at the spinal cord level suppressing noxiously evoked activity of the wide dynamic range neurons.

References:

[1]Robertson K, Douglas MJ, McMorland GH: Epidural fentanyl with and without epinephrine for post-cesarean section analgesia. Can Anaesth Soc J 32(5):502-5, 1985.

[2]Semple AJ, Macroe DJ, Munishankarappa S, Burrow LM, Milne MK, Grant JS: Effect of the addition of adrenaline to extradural diamorphine analgesia after cesarean section. Br J Anaesth 60:632-638, 1988.

[3]Collins JG, Kitahata LM, Matsumoto M, Homma E, Suzukawa M: Spinally administered epinephrine suppresses noxiously evoked activity of WDR neurons in the dorsal horn of the spinal cord. Anesthesiology 60:269-275, 1984.

FIGURE 1