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TITLE: EPIDURAL CLONIDINE FOLLOWING CESAREAN SECTION: EFFECT OF PRIOR LOCAL ANESTHETIC

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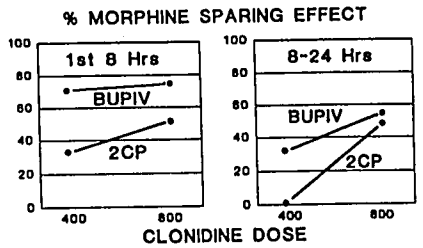
Introduction: After cesarean section, epidural clonidine bolus produces analgesia which is brief but can be prolonged with addition of a continuous infusion. Preliminary studies of various dosing regimens have produced conflicting data, and the most appropriate dosing schedule has not been defined. Also, whether 2-chloroprocaine (2CP), which has recently been shown to antagonize epidural opioid analgesia, affects epidural clonidine analgesia is unknown. The purposes of this study were to define clonidine bolus and infusion regimens for analgesia following cesarean section and to examine the effect of 2CP on clonidine analgesia.

Methods: Following written informed consent and IRB approval, 63 women scheduled for repeat cesarean section were studied. Patients were randomly assigned to receive 3% 2CP or 0.5% bupivacaine for anesthesia, and within each group were assigned to receive saline or clonidine (400 μg or 800 μg) upon request for analgesia in the recovery room, followed respectively by 24-hr infusion of saline or clonidine (40 μg/hr). Supplemental analgesia was provided with iv PCA morphine; and pain, sedation, nausea, pruritus, respiratory rate, blood pressure, and heart rate were monitored for 24 hrs.

Results: Compared to their respective saline groups, both low and high dose clonidine regimens produced analgesia throughout the 24-hr period, whereas 2CP inhibited clonidine analgesia for 8 hrs in the high dose and 24 hrs in the low dose clonidine groups (Fig 1; $P<0.05$). Clonidine produced sedation, and prolonged resolution of motor, but not sensory block in the bupivacaine groups. Clonidine decreased heart rate in all groups, but only the low dose in the bupivacaine group decreased blood pressure. One patient received atropine for asymptomatic bradycardia and one received iv fluids for asymptomatic hypotension in the clonidine groups; one was observed for respiratory depression in the saline group.

Discussion: Antagonism of clonidine analgesia by 2CP suggests that this effect has a similar mode of action as that occurring at the opiate receptor. Antagonism can be overcome by increasing clonidine dose, but these data suggest that prolonged analgesia can be obtained with less drug using bupivacaine followed by the low dose clonidine bolus-infusion regimen.



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A856

Title: EPIDURAL FENTANYL AND SUFENTANIL WITH BUPIVACAINE FOR LABOR: MATERNAL AND NEONATAL EFFECTS

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Introduction: Epidural fentanyl and sufentanil are administered with bupivacaine to provide analgesia during labor and delivery. While various combinations have proved effective, it is unclear whether either opioid offers advantages with respect to maternal effects or neonatal well-being. This study was designed to compare bupivacaine, fentanyl-bupivacaine and sufentanil-bupivacaine mixtures when administered for labor analgesia.

Methods: After Human Subjects Committee approval, informed consent was obtained from 32 healthy, term parturients requesting epidural analgesia for labor. Patients randomly received, double-blind, an initial dose of either: 12 ml 0.25% bupivacaine (Group B; n=11), 12 ml 0.125% bupivacaine + fentanyl 75 μg (Group B-F; n=12) or 12 ml 0.125% bupivacaine + sufentanil 12.5 μg (Group B-S; n=9). After 20 min, an infusion was started at 10 ml/hr with Group B receiving 0.125% bupivacaine, Group B-F 0.125% bupivacaine + 1.5 μgm/ml fentanyl, and Group B-S 0.125% bupivacaine + 0.25 μgm/ml sufentanil. Breakthrough pain was treated with 5 ml doses of 0.25% bupivacaine. Analgesia was assessed at frequent intervals using a 10 cm Visual Analogue Pain Scale (VAPS). Nausea, pruritus, somnolence and motor block were ranked on a 0-3 scale and assessed hourly. Neonatal evaluation included cord blood gases, time to sustained respiration, Apgar scores and Neurologic and Adaptive Capacity Scores (NACS) at 15 min, 2 h and 24 h of age. Maternal and umbilical cord opioid levels were measured at delivery. Data were analyzed using ANOVA, Kruskall Wallis and Chi square tests with $P < 0.05$ considered significant.

Results: The groups were similar with respect to maternal age, height, weight, gravity, and parity. There were no significant differences with respect to onset of analgesia, total bupivacaine dosage, or number of supplemental doses. Total fentanyl dose was 146 ± 14 μg (mean ± SE) and sufentanil dose 24 ± 2 μg. Motor blockade was minimal and equal in all groups. VAPS scores decreased significantly within 5 min of the initial dose in all groups ($p = 0.001$ vs. control) and remained low up to and including delivery. VAPS tended to be lowest in the B-S group between 15 and 30 min ($p = 0.08$). There was a higher incidence of pruritus with B-F ($p < 0.05$), as well as a tendency toward more nausea ($p = 0.12$). Maternal vital signs were similar in all groups. There were no differences in cord blood gases, 1 and 5 minute Apgar scores, or NACS at 15 min and 2 h of age. However, in the B-F group NACS were significantly lower at 24 h ($p < 0.05$; table). Umbilical vein (UV) and maternal vein (MV) fentanyl concentrations were 0.17 ± 0.03 and 0.54 ± 0.03 ng/ml, respectively (n = 10); UV and MV sufentanil concentrations were both 0.02 ± 0.005 ng/ml (n = 8). Sufentanil was undetectable in 4 of 5, and fentanyl in 2 of 8 samples of umbilical artery blood.

	15 min NACS	2 hr NACS	24 hr NACS
B	34 ± 1.3	35 ± 0.7	37 ± 0.6
B-S	33 ± 1.1	34 ± 0.7	37 ± 0.4
B-F	32 ± 0.9	35 ± 0.6	34 ± 0.9

Discussion: All study solutions provided satisfactory pain relief, with sufentanil tending to improve early analgesia. Fentanyl was associated with more side effects and lower 24 h NACS than sufentanil. These differences may relate to the high lipid solubility of sufentanil permitting rapid entrance into the neuraxis and more rapid clearance from the mother and neonate.