Title: A COMPARISON OF EPIDURAL FENTANYL, BUPRENORPHINE AND BUTORPHANOL FOR THE MANAGEMENT OF POST CESAREAN SECTION PAIN

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Introduction. Epidural fentanyl, buprenorphine, and butorphanol were reported to be effective in the management of post cesarean section pain (1-3). The purpose of this study was to evaluate and to compare the duration of analgesia and the side effects of equipotent doses of fentanyl (a pure agonist), buprenorphine (an agonist-antagonist) and butorphanol (an agonist-antagonist).

Methods. The experimental protocol was approved by the Institutional Review Board and written informed consent was obtained from all patients. Sixty (60) ASA Class I or II patients who were scheduled for elective cesarean sections who had requested epidural anesthesia were randomly assigned to one of four groups. After intravenous hydration with 12-15 mg/kg of fluid, an epidural catheter was placed at the L2-3 or L3-4 interspace prior to surgery. Bupivacaine 0.5% was given until a bilateral T4 sensory level to pinprick was obtained. Each patient was placed on the operating table in a left lateral tilt and received oxygen by nasal cannulae until delivery of the baby. The patients were randomly assigned to one of four groups to receive one of four study solutions in a double blinded fashion: Group I: 10 ml of preservative free saline; Group II: 50 ug of fentanyl dissolved in 9 ml of saline; Group II: 0.3 mg of buprenorphine dissolved in 9 ml of saline; and Group IV: 2 mg of butorphanol dissolved in 9 ml of saline. All epidural study solutions were given at a rate of 2 ml/min immediately after delivery of the baby. All patients had their respiratory rates recorded and were monitored with a blood pressure cuff, pulse oximeter and an electrocardiograph. The duration of analgesia was defined to be from the time of epidural study solution injection until the patient experienced any pain (a score >0 on a 0-10 verbal response scale). The duration of analgesia and the incidence of pruritus, nausea/vomiting, disturbances in micturition, respiratory depression (defined as a rate of $\leq$10), and sedation (scored as 0=no sedation; 1=mild to moderate sedation; 2=loss of consciousness) were recorded.

Statistical analysis was done using the one way analysis of variance, the Tukey and Duncan's multiple range test, and the complex Chi squared test where applicable. Significance is $p < 0.05$.

Results. There were no differences in patient height, weight, parity, the dose of local anesthetic administered or in the duration from the time of study solution administration until the end of surgery. The duration of analgesia was significantly longer with epidural buprenorphine (Table 1). The incidence of pruritus was higher with fentanyl while the incidence of sedation was higher with butorphanol. No nausea/vomiting, disturbances in micturition or respiratory depression were noted in any group.

Table 1. Effects of epidural fentanyl, buprenorphine and butorphanol (mean $\pm$ SD).

	Groups			
Variables	I	II	III	IV
Pruritus (N/%)	0	7/46.7*	0	1/6.7
Sedation (N/%)	0	3/20	2/13.3	7/40.7*
Postop. nausea or vomiting (N/%)	0	0	0	0
Disturbances in micturition (N/%)	0	0	0	0
Duration of analgesia (min)	50.47* $\pm$13.3	145 $\pm$38.2	388.06* $\pm$54.6	117 $\pm$36.4
Resp. depression (N/%)	0	0	0	0
Baseline respiratory rate (bpm)	17.34 $\pm$1.03	17.73 $\pm$1.49	16.97 $\pm$0.97	17.2 $\pm$1.02
Mean 12 hr respiratory rate (bpm)	16.9 $\pm$1.21	17.26 $\pm$1.04	17.01 $\pm$1.6	17.54 $\pm$1.11

*$p < 0.05$.

Discussion. Epidural buprenorphine provided the longest duration of analgesia with less pruritus than fentanyl and less sedation than butorphanol for the management of postoperative cesarean section pain.

References

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