TITLE: COMPARISON OF CONTINUOUS EPIDURAL INFUSIONS OF SUFENTANIL-BUPIVACAINE WITH MORPHINE-BUPIVACAINE

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Introduction: The continuous epidural infusions of morphine-bupivacaine (M-B) and fentanyl-bupivacaine solutions have been shown to produce excellent postoperative analgesia.[1,2] Because of its lipophilic nature, fentanyl has the advantage of producing less side effects as compared to morphine.[2] Sufentanil, another highly lipophilic narcotic, has been suggested to produce analgesia and reduced side effects similar to fentanyl. The following prospective study was undertaken to evaluate the degree of analgesia and the incidence of side effects between combinations of epidural sufentanil-bupivacaine (S-B) and M-B infusions.

Methods: Following institutional approval, informed consent was obtained from 40 ASA physical status I and II patients having elective cesarean section. Patients were randomized into two treatment groups in a double-blind fashion. Group 1 patients were given morphine .01% (100 ug/cc) bupivacaine 0.1% (n=20). Group 2 patients received a mixture of sufentanil .0002% (2 ug/cc) bupivacaine .1% solution (n=20).

Lumbar epidural catheters were placed and anesthesia for surgery was established with lidocaine 2% with epinephrine 1:200,000 to the fourth thoracic dermatomal level. Immediately upon arrival to Post-Anesthesia Recovery Room (PAR) patients were given a 5 cc bolus of their respective study solution and continued on an infusion of 5 cc/hr of that solution for 24 hours. If needed, patients received demerol 50-75 mg with hydroxyzine 25 mg IM every 4 hours for inadequate analgesia. Data consisted of degree of analgesia as measured by a visual analog scale, number and dose of supplemented narcotic, the incidence of pruritis, nausea, numbness, time to ambulation and respiratory rate. Observations were recorded upon arrival to PAR and every 4 hrs for 48 hrs by nursing staff caring for the patient. Data was analyzed by two way ANOVA with one repeated measure and by Fisher exact test with $p < 0.05$ considered statistically significant. Post-hoc testing was done where appropriate using the Tukey-a method.

Results: The degree of analgesia between groups, as measured by pain scores, was similar except at 3 observation periods. At the 4 hour time period, S-B provided statistically better analgesia than M-B, whereas at the 12 hour and 28 hour time period the M-B solution provided better analgesia as compared to S-B. For the remainder of the study period, the degree of analgesia was similar. The time period at which the highest number of patients required supplemental analgesia was at 4 hours where 13 patients (32%) required 1 intramuscular narcotic injection. At this time more M-B patients (n=9; 70%) require supplemental analgesia as compared to the S-B patients (n=4; 25%). This, however, did not reach statistical significance (p=.09). The number of additional IM supplements needed for analgesia was not different between the two groups except at the 32 hour period. At this point, 6 patients (33%) who were receiving S-B required supplemental analgesia while no patient in the M-B group required a supplemental injection.

Pruritis occurred more commonly in patients receiving the M-B solution. The incidence of pruritis for the entire study population was 47% (n=19). Pruritis was three times more common in the M-B group (n=14; 70%) as compared to the S-B group (n=5; 25%). The highest incidence of pruritis was at the 16-20 hour time period in both groups. There was no pruritis present in patients receiving S-B from the 28 hour time period, shortly after stopping the infusion; while the pruritis in the M-B patients persisted until the 36 hour time period, twelve hours after stopping the infusion. The incidence of nausea in the study population was 7.5% (n=3), with no statistical significance between groups. Respiratory depression, defined as a respiratory rate less than 12, did not occur in any patient. There was no statistical difference in respiratory rates between groups at any time or between any time period and control.

Discussion: The results of this study indicate that the continuous infusion of S-B at the dosage studied can produce analgesia similar to a M-B infusion. In a pattern similar to a fentanyl-bupivacaine infusion, it produces less pruritis than M-B[2]. There was a tendency for analgesia with S-B to have a quicker onset compared to M-B; however, analgesia with M-B persisted for up to 12 hours following discontinuation of the epidural, but for only 4 hours in the S-B group. This is understandable based upon the premise that greater lypophilicity of sufentanil speeds the onset of action and redistribution following discontinuation of the epidural. The pruritis associated with S-B also diminished much faster as compared to M-B as would also be expected. In conclusion, the results of this study indicate that the epidural use of S-B can be desirable because it allows one to titrate analgesia in a more predictable fashion with fewer side effects. It is evident that further studies are needed to confirm this premise.

References:

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