

TITLE: CONTINUOUS EPIDURAL BUPIVACAINE-FENTANYL INFUSIONS IN CHILDREN FOLLOWING URETERAL REIMPLANTATION

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Introduction:

In adults, combined epidural infusions (EI) of bupivacaine (B) and fentanyl (F) provide excellent postoperative analgesia. A previous retrospective study suggested similar efficacy and safety in children¹. A randomized double-blind study was performed to compare efficacy, side-effects, and effective EI rates of F (2 mcg/cc), B-F (B 0.0625%; F 1 mcg/cc), and B (0.125%).

Materials and Methods

Following parental informed consent as approved by the Committee on Clinical Investigation, 56 children undergoing ureteral reimplantation were enrolled (ASA physical status I or II, ages 2 months to 15 years). Anesthesia was maintained with nitrous oxide and isoflurane. Following induction, a lumbar epidural catheter was placed, and lidocaine (L) 1% 0.4 cc/kg was given initially, followed by L 0.5%, 0.4 cc/kg/hr during surgery.

Postoperatively, patients received blinded EI of F, B-F, or B for 48 hours. No systemic opioids were used. Pain intensity and motor blockade were assessed for all patients every 4 hours using the OPS² and Bromage scale³, respectively. EI were adjusted to the minimum rate needed to keep OPS < 2. Data were analyzed by ANOVA, regression analysis, or chi square.

Results

56 patients were studied. 1 epidural catheter was malpositioned. There were no dural punctures or serious

complications. Patients in all 3 groups attained excellent analgesia, with mean OPS scores < 1 on a 0-10 scale (Table 1). There were no statistical differences among groups in the incidence of emesis or in mean or minimum respiratory rates. Pruritus occurred most often in the F group and least in the B group. Pain scores and normalized infusion rates did not vary with age or weight.

Discussion

Lumbar epidural analgesia using F, B, or B-F can provide excellent analgesia in infants, children and adolescents undergoing lower abdominal surgery. EI using B-F may offer a wide therapeutic ratio.

References

1. Anesth Analg 70:S22, 1990.
2. Anesthesiology 69:A770, 1988.
3. Acta Anaesthesiol. Scand. 16: [Suppl] 55, 1965.

Table 1 Epidural Infusion Outcome Measures

Parameter	Group			Significance
	F	B-F	B	
n	17	20	19	n.s.
age (years)	6.7	6.5	4.2	n.s.
weight (kg)	25.6	26.2	18.0	n.s.
infusion rate (ml/kg/hr)	0.46	0.43	0.55	n.s.
OPS	0.8	0.7	0.7	n.s.
emesis (episodes/pt)	1.4	1.0	0.9	n.s.
somnolence	1	1	0	n.s.
pruritus	6(33%)	3(14%)	0	0.02
"block dysphoria"	0	0	2	n.s.
Bromage score	0.3	0.5	0.7	n.s.
respiratory rate (mean/minimum)	24/20	24/18	28/22	n.s.
pupil size (mm)	3.4	3.9	4.6	0.02

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TITLE: EFFICACY AND SAFETY OF LOW-DOSE CAUDAL MORPHINE FOR POSTOPERATIVE ANALGESIA IN INFANTS AND YOUNG CHILDREN

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Caudal morphine has been shown to provide effective postoperative analgesia in children. Potential complications include respiratory depression, pruritus, nausea, vomiting, and urinary retention. Results of a recent cumulative dose-response study suggested the safety and efficacy of low-dose (0.033-0.067 mg/kg) caudal morphine.¹ This report describes the efficacy and side-effects of a single caudal injection of low-dose morphine (0.030 mg/kg) with bupivacaine in young children undergoing elective genitourinary tract surgery.

With institutional approval, we retrospectively reviewed records of 54 unpremedicated ASA PS I and II children aged 7-71 months who underwent surgery between April, 1988 and December, 1989. All patients had inhalation anesthetics. Group I patients (N=32) were supplemented with a single caudal injection of bupivacaine (0.125-0.50%) and preservative-free morphine (0.03 mg/kg) in a total volume of 0.4-0.8 ml/kg. Group II patients (N=22) received narcotics and/or acetaminophen alone. Caudal morphine patients were monitored with nursing evaluation of respiratory rate and arousal level; 69% were also monitored with continuous ECG and transthoracic impedance apnea monitoring. The following were noted during the 24 hour postoperative period: a) the number of patients who received supplemental narcotics (NARC) and those who received either narcotics and/or acetaminophen (AC+NARC); b) the interval to administration of narcotics (I-NARC) or any analgesics (I-AC+NARC); c) the interval to first void (I-VOID)

and oral intake; and d) appearance of side-effects including somnolence, apnea, hypopnea, vomiting, and pruritus. Statistical significance was determined using Chi-square, Fisher's Exact Test (two-tailed), and Wilcoxon Rank Sum test.

Mean age was not different between Groups I and II (27+/-16 vs 33+/-19 months). Repair of hypospadias, chordee, and orchidopexy accounted for 85% of operations. Results are shown in the Table. The requirement for postoperative analgesia was reduced and the pain-free interval extended significantly in Group I compared to Group II children. Apnea, hypopnea, and somnolence did not occur in either group. There was no statistically significant difference between groups in the time to first oral intake or incidence of emesis. Among Group I patients, one developed pruritus not requiring treatment, and two required a single dose of bethanechol for urinary retention.

We conclude that a single dose of 0.03 mg/kg caudal morphine in bupivacaine: 1) provided effective postoperative analgesia in infants and young children; 2) had a duration comparable to that reported for higher doses; 3) had a side-effect profile equivalent to that produced by systemic analgesics; and 4) did not result in somnolence or respiratory depression.

TABLE	Group I (N=32)	Group II (N=22)
NARC	8/32 (25%)	14/22 (64%)
AC+NARC	19/32 (59%)	21/22 (95%)
I-NARC (hrs)	11.9±6.8	2.9±3.0
I-AC+NARC (hrs)	10.3±5.2	4.0±3.8
I-VOID (hrs)	7.4±2.2	6.5±2.6
	*p<0.05	**p<0.01 #NS

REF:1.Krane EJ et al: Anesthesiology 71:48,1989