Title: A COMPARISON BETWEEN GRAVITY AND BOLUS ADMINISTRATION OF LOCAL ANESTHETICS DURING EPIDURAL BLOCK IN OBSTETRICS.

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The safety of gravity administration was reported in a retrospective study (1). To determine whether administration of local anesthetic solution into the epidural space is associated with fewer adverse effects than the traditional bolus injection, we conducted a prospective randomized study of 415 consenting parturients, who received epidural block. With IRB approval the patients were randomly allocated to two groups: Group I (n=207) received the study solution by gravity as shown in Fig 1. Group II (n=208) received the study solution by traditional bolus injection. Following a standard lumbar epidural approach, all patients received a test dose of 3 ml 3%-chloroprocaine with epinephrine 20 µg by gravity in Group I and by bolus in Group II. For labor and delivery (L/D) an additional two doses of bupivacaine 0.03% with sufentanil 1 µg/ml and epinephrine 2 µg/ml were given by gravity or bolus. For cesarean section (C/S) the test dose was followed by two doses of 6 ml lidocaine 2% with sufentanil 1 µg/ml and epinephrine 2 µg/ml given by gravity or bolus. Following each administration, baseline and maximal heart rates were recorded, as well as, evidence of intravascular or intrathecal injection.

Adverse effects are shown in Table 1. The changes in HR and the duration over which each dose was given through the needle are shown in Table 2. While three patients who received a bolus injection of the local anesthetic solution had signs of systemic toxicity, no patient in the gravity group had this adverse reaction. This was not statistically different. At present, these data show that gravity administration in obstetrics is associated with less systemic absorption (sedation) and produces fewer hemodynamic changes when compared with the traditional bolus injection.

1. Reg. Anesth 15:S81, 1990.

Table 1. Adverse Effects

	Systemic Toxicity	Sedation	Pruritus	Shivering	Hypotension
L/D (n=259)					
Group I (n=132)	0	3	13	11	0
Group II (n=127)	1	7	14	10	0
C/S (n=156)					
Group I (n=95)	0	5*	0	15	13†
Group II (n=81)	2	13	5	15	25

*p < .05, Group I vs. II. †p = .052, Group I vs. II.

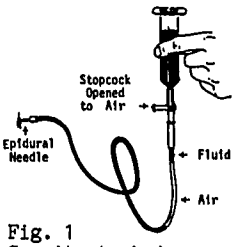

Fig. 1
Gravity technique.

Table 2. The duration of each local anesthetic administration and the change in heart rate from baseline after each dose.

	DURATION (SEC) Group I Mean±SD	DURATION (SEC) Group II Mean±SD	CHANGE IN HR (BPM) Group I Mean±SD	CHANGE IN HR (BPM) Group II Mean±SD
Test dose	28.2±5.2	4.2±1.0	5.3±3.5	7.0±4.2
	p < .001		NS	
2nd dose	34.1±7.6	5.9±5.0	5.0±3.32	8.1±4.4
	p < .001		p < .001	
3rd dose	35.4±8.6	6.1±5.2	4.8±3.3	7.3±4.3
	p < .001		p < .001	

Comparisons between Groups I and II were made by ANOVA with the L/D and C/S patients combined.

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TITLE: CONTINUOUS EPIDURAL-PCA POST-CESAREAN SECTION: BUPRENORPHINE-BUPIVACAINE 0.03% vs FENTANYL-BUPIVACAINE 0.03%

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We compared effects of epidural-PCA infusions of buprenorphine-bupivacaine to fentanyl-bupivacaine with regard to quality of analgesia, side effects and plasma opioid concentrations. Following IRB approval, we conducted a double-blind study of 23 consenting, healthy parturients for elective cesarean section without systemic opioids. Upon arrival in the PACU patients were randomized to two groups: I (n=12) epidural-PCA infusion of buprenorphine 3 µg/ml with bupivacaine 0.03% and II (n=11) epidural-PCA infusion of fentanyl 2 µg/ml with bupivacaine 0.03%. Overall satisfaction was assessed with a 10-point scale. Plasma samples for opioid determinations were obtained at intervals. Epidural infusion characteristics are shown in Table 1. Pain relief was comparable and satisfactory in both groups. Side effects are shown in Table 2. None of the patients had a respiratory rate < 12 breaths/min or urinary retention. Plasma concentrations of buprenorphine and fentanyl are shown in Figure 1. The intensity of pruritus, sedation, nausea and vomiting did not correlate to plasma levels with either drug. The median overall satisfaction score for Group I was 7.5 and 10 for Group II (p < .03).

Epidural-PCA for postcesarean section pain relief with either drug was free from serious adverse effects. Transient lower extremity sensory loss interfered with ambulation in some patients in both groups. Vomiting was most disturbing to the patients and seen only in those receiving buprenorphine. Overall. patients were more satisfied with fentanyl.

Table 1. Epidural infusion characteristics*

	Duration (HR) Mean	Duration (HR) Range	Total Vol. (ml) Mean±SEM	Average Infusion (ml/hr) Mean±SEM
Group I	34.2	24-48	458.2±30.9	13.7±0.7
Group II	39.0	24-60	531.8±68.6	13.5±0.9

Table 2. Side Effects*

	Group I n	Group I (%)	Group II n	Group II (%)
Pruritus	6	(50)	8	(72.7)
Sedation	7	(58.3)	6	(54.5)
Nausea	4	(33.3)	0	(0)
Vomiting	3	(25)	0	(0)
Sensory Deficit	4	(33.3)	6	(54.55)

*There were no significant differences between the groups.

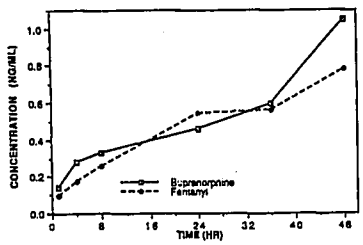

Fig. 1
Plasma opioid concentrations