

TITLE: EPIDURAL VS INTRAVENOUS FENTANYL INFUSIONS IN POSTTHORACOTOMY PATIENTS: ANALGESIC AND PHARMACOKINETIC EFFECTS.

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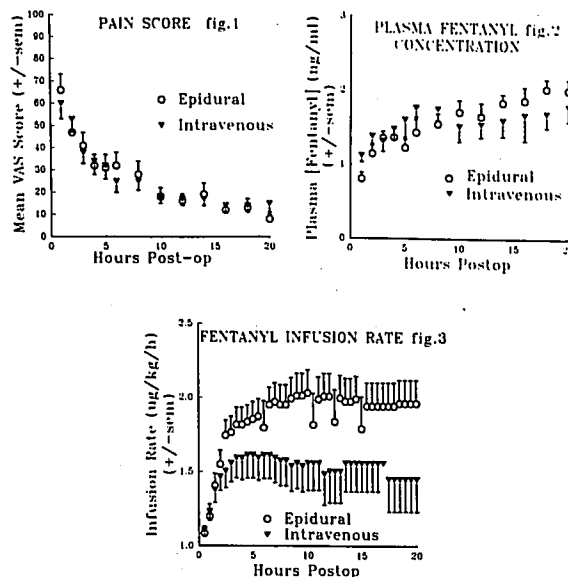
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Intravenous and epidural infusions of fentanyl are effective for post-operative pain relief. This study compared dose requirements, analgesic effects and systemic uptake of continuous lumbar epidural and intravenous fentanyl infusions after thoracotomy.

Methods: With institutional approval and informed consent, 27 patients were entered in a double-blinded study. After insertion of a lumbar epidural catheter patients were given a non-opioid general anaesthetic. The patients were randomly allocated to one of two groups: Group E= epidural fentanyl infusion/iv normal saline infusion. Group I= epidural normal saline infusion/iv fentanyl infusion. One hour after induction, a bolus of 1.5 ug/kg of fentanyl was administered via the allocated route and an infusion of 1.0 ug/kg/hr fentanyl was begun and continued for 24 hr. Pain was assessed using a visual analogue pain score (100=severe pain, 0=no pain). For pain scores > 33 a further bolus of 0.5 ug/kg fentanyl was given and the infusion increased by 0.25 ug/kg/hr. Plasma fentanyl concentration was measured at regular intervals. Results were analyzed using Student's t-tests, Mann Whitney U, and repeated measures analysis of variance. **Results:** There were no statistical differences between groups for age, weight, height, sex or duration of surgery. Pain scores (figure 1), and plasma fentanyl concentrations (figure 2) were not significantly different between the two groups during the study period. Although infusion rates were higher for the epidural group (figure 3), this was not statistically significant.

Discussion: Lumbar epidural and intravenous infusions of fentanyl can provide good post-thoracotomy pain

relief. The lack of a significant difference between E and I in the dose requirement and the plasma concentration supports systemic absorption as a major mechanism of action for lumbar epidural fentanyl.



TITLE: Effect of Epidural Block Level on Plasma Catecholamines

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Epidural anesthesia (EA) is said to produce a fall in plasma catecholamine concentrations but the few studies investigating this postulated effect do not correlate the level of block to changes in plasma catecholamine values (1,2). We performed this study to assess what change, if any, varying the level of EA has upon resting plasma epinephrine (E) and norepinephrine (NE) levels.

After IRB approval and informed consent, 10 anesthesia providers were enrolled. Each subject underwent lumbar epidural and central venous catheter placement. Blood pressure, EKG, and CVP were continuously monitored. EA was achieved using 3% 2-chloroprocaine (plain) injected via the epidural catheter. Three levels of EA were sequentially sought in ascending order: T-10, T-4, and C-8. The blockade was allowed to completely dissipate after each level had been achieved.

Blood samples were drawn after a rest

period at the start of the experiment and 20 minutes after reaching each of the three levels, as assessed by pin-prick. The radio-enzymatic method was used to measure plasma NE and E levels. Repeated measures analysis was used with $p < 0.05$ considered statistically significant.

Plasma E concentration did not significantly change at any level of block. Although there was a trend toward decreasing NE with higher levels of EA, a statistically significant reduction was seen only when EA block reached the C-8 dermatome. (see Table)

Since the adrenal medulla is innervated by sympathetic efferent fibers (T-6 to L-2), one might predict a fall in resting NE and E levels when these dermatomes are blocked by EA. Surprisingly, this did not occur. We conclude that EA to the C8 level provides incomplete blockade of resting sympathetic activity.

	Table	
	NE (mean \pm SD)	E (mean \pm SD)
baseline	195 \pm 109	64 \pm 48
T-10	195 \pm 143	53 \pm 62
T-4	144 \pm 92	72 \pm 46
C-8	105 \pm 83*	42 \pm 37

* = $p < 0.05$

1. Acta Anaes Scand 24:17-21, 1980
2. Anesthesiology 62:294-297, 1985