

**TITLE:** EPIDURAL VS INTRAVENOUS FENTANYL INFUSIONS IN POSTTHORACOTOMY PATIENTS: RESPIRATORY EFFECTS.

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Respiratory depression in patients receiving epidural fentanyl is uncommon. This prospective double-blind randomized study compared lumbar epidural and intravenous fentanyl infusions with respect to postoperative respiratory function.

**Methods:** With institutional approval and informed consent 27 patients undergoing thoracotomy were studied. Respiratory pattern [Respiratory Inductance Plethysmography (RIP)] and arterial blood gases (ABG) were measured preoperatively during sleep. RIP measured apnea (AP-tidal volume less than 100 ml) and slow respiratory rate (SRR-respiratory rate less than 10/min). After insertion of a lumbar epidural catheter patients were given a non-opioid general anaesthetic. Patients were allocated to one of two groups: Group E=epidural fentanyl infusion/iv saline infusion, Group I=epidural saline infusion/iv fentanyl infusion. Intraoperatively, a bolus of 1.5 ug/kg of fentanyl was given (E or I) followed by an infusion of 1.0 ug/kg/hr. Infusion rates were adjusted to provide high quality analgesia. Postoperatively RIP monitoring was resumed and ABG's and somnolence (1=awake, 5=unconscious) were measured at regular intervals. Results were analyzed using Student's t-test plus repeated measures analysis of variance and covariance.

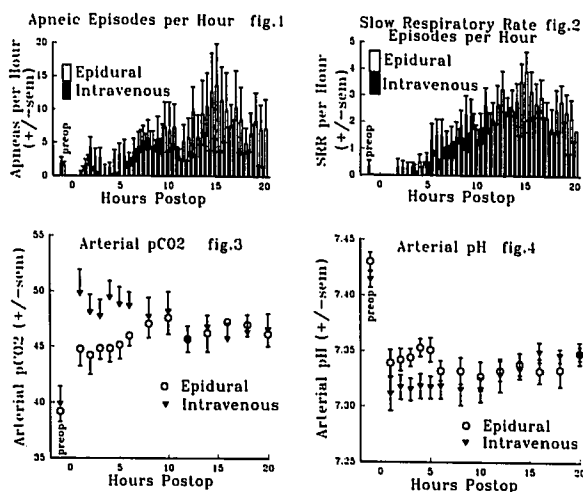
**Results:** There were no significant between group differences for both pre and postoperative AP/hour, SRR/hour, pH, pCO<sub>2</sub>, pO<sub>2</sub> or somnolence. However, within groups there was a significant increase in SRR episodes, decrease in pH and rise in PCO<sub>2</sub> postoperatively.

**Discussion:** There was no difference in respiratory parameters between E and I fentanyl infusions post-thoracotomy although both were associated with respiratory depression.

TABLE 1. GROUP MEANS (± sem)

	EPIDURAL		INTRAVENOUS	
	Preop	Postop	Preop	Postop
pH	7.43 ± 0.01	7.34 ± 0.01*	7.41 ± 0.01	7.33 ± 0.01*
PCO <sub>2</sub>	39 ± 1	46 ± 1*	40 ± 2	48 ± 1*
pO <sub>2</sub>	81 ± 3	108 ± 3*	83 ± 3	116 ± 3*
Somn.	N/A	1.6 ± 0.1	N/A	1.6 ± 0.1
AP/h	1.5 ± 0.5	5.2 ± 2.0	2.0 ± 0.7	3.1 ± 1.0
SRR/h	.02 ± .01	1.5 ± 0.3*	0.3 ± 0.2	1.3 ± 0.3*

\* P < 0.05 postop vs. preop N/A = Not applicable  
Somn = somnolence; AP/h = apneas/hour;  
SRR/h = slow respiratory rates/hour



## A782

**TITLE:** DEEP AND SUPERFICIAL CERVICAL PLEXUS BLOCK WITH BUPIVACAINE FOR CAROTID ENDARTERECTOMY: PHARMACOKINETIC STUDY.

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Cervical plexus block is an effective technique for carotid endarterectomy (1). A previous pharmacokinetic study has shown that peak concentration of bupivacaine 0.5% (18ml) with epinephrine is relatively low (1.67 µg/ml), when associated with xylocaine 2% (10 ml) for superficial cervical plexus block (2). The aim of this study is to determine the pharmacokinetic parameters of bupivacaine following deep and superficial plexus block. Eight patients (ASA II-III) were studied after ethical approval and informed consent. The deep cervical plexus block was performed with 18 ml 0.5% bupivacaine with epinephrine, the superficial block with 8 ml of the same solution (total dose: 130 mg). Continuous ECG and blood arterial pressure monitoring were recorded. Adequacy of cerebral perfusion was obtained by neurologic assessment of the awake patients. Evaluation of pain using a 0 to 10 visual analog scale was done preoperatively, at incision, cross clamping, unclamping and closure. Blood gas analysis was performed and arterial blood samples were assayed for bupivacaine from 0 to 600 minutes after bupivacaine administration. Plasma concentration was measured using gas chromatography. Non compartmental analysis was used to fit the data. Terminal half life (T 1/2 β), total body clearance (CL), ap-

parent volume of distribution (V<sub>B</sub>), maximum peak concentration (C<sub>MAX</sub>) and time to reach the peak (T<sub>MAX</sub>) were calculated. A satisfactory pain relief was obtained in all patients. No hemodynamic variations were observed. No respiratory depression was noted during the procedure. T 1/2 β was 149 ± 30 minutes; CL was 6.7 ± 2.3 ml/min.kg; V<sub>B</sub> was 85.4 ± 19.5 litres. C<sub>MAX</sub> reached 2.09 ± 0.41 µg/ml; T<sub>MAX</sub> was 12 ± 7 min. Bupivacaine plasma concentration decrease is shown on figure 1.

For carotid endarterectomy, deep and superficial cervical plexus block with bupivacaine with epinephrine is a safe technique because C<sub>MAX</sub> never reached the plasma toxic level.

**References:**

- 1-Arch. Surg. 122: 807-812, 1987
- 2- Anesthesiology 69: A373, 1988

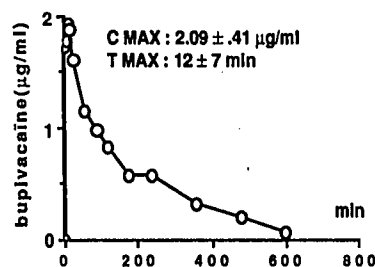


Figure 1: Pharmacokinetics of bupivacaine