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Title: **EPIDURAL FENTANYL AND BUPIVACAINE COMBINATIONS IN PATIENTS UNDERGOING PELVIC SURGERY**

Authors: **P.A. Tewes, M.D., Ph.D., L.M. Vella, FFARCS, S. Thomas, M.D., and H.M. Goll, M.D.**

Affiliation: Department of Anesthesiology and Critical Care Medicine, Johns Hopkins Hospital, Baltimore, Maryland 21205

Introduction: Epidural fentanyl has significant analgesic effects in obstetric patients without clinically significant respiratory depression, and in combination with bupivacaine is useful in the management of pain during labor (1). However, there have been few studies of this drug combination in surgical patients, and these studies (2) have observed effects only at relatively high fentanyl doses (200 ug) which may cause respiratory depression (3). The purpose of this study was to evaluate whether the addition of low doses of fentanyl (50 and 100 ug) to epidural bupivacaine would be useful in shortening the time to onset of surgical anesthesia, decreasing the dose of bupivacaine, and enhancing postoperative analgesia.

Methods: Institutional approval and informed consent was obtained for forty male ASA I and II patients aged 46-70 undergoing radical retropubic prostatectomies. All received a benzodiazepine premedication and 1000 ml of Ringers Lactate prior to the epidural. The epidural needle was placed at the L 3-4 interspace. After a negative test dose, patients received 16 to 18 ml of 0.5% bupivacaine (standardized by age) mixed with the study drug through the needle, then a catheter was placed. Patients in Group I (n=17) received 2 ml saline, Group II (n=12) received 1 ml saline and 1 ml (50 ug) fentanyl and Group III (n=11) received 2 ml (100 ug) fentanyl. Treatments were randomized and double blinded. If the patient did not achieve a T8 level of blockade 15 minutes after drug injection, an additional dose of 1/2 of the original dose of bupivacaine was given. The same additional dose was given during surgery if patients experienced pain or had greater than 2 segment regression of sensory level to pinprick.

Data were collected 1,3,5,7,9,11,13,15,20, and 30 minutes after drug administration, and every 30 minutes thereafter until completion of surgery, which lasted 2-3 hours. Data included heart rate, blood pressure, sensory level to pinprick, presence of motor blockade by Bromage's scale, need for additional doses, and side effects including itching and nausea.

Results: The mean time to onset of sensory block, of T8 block (surgical anesthesia), and of sacral block were significantly decreased from control for both 50 and 100 ug of fentanyl (Table 1). There was no significant difference between the two doses. The onset time of motor block was not significantly different from placebo for either dose of fentanyl. Seven of the 17 placebo patients required an additional dose of bupivacaine during the operation, while 3 of 12 in Group II and 2 of 11 in Group III required an additional dose. The mean time of onset to patient's request for analgesia following surgery was prolonged in patients receiving 100 ug of fentanyl (Table 2). However, total analgesic requirements during the first 24 hours post-operatively were same for all groups.

Respiratory depression or pruritus was not observed in any patient. One patient, who had received 100 ug fentanyl, experienced nausea associated with bradycardia and hypotension ten minutes after drug injection. This was treated with ephedrine 5 mg without any sequelae.

Discussion: The addition of 50 or 100 ug of fentanyl to the bupivacaine epidural resulted in more rapid onset of sensory block and surgical anesthesia, and lower total bupivacaine dose. These beneficial effects were apparent even at the lowest dose of fentanyl(50 ug). The addition of fentanyl to the epidural did not significantly affect the time of onset of motor block which is in agreement with a previously reported study (2).

The addition of 100 ug of fentanyl appeared to enhance early postoperative analgesia; although the lower 50 ug dose had no effect. It should be noted that one patient in Group III required no analgesics in the first 24 hours after surgery.

We conclude that combinations of low doses of fentanyl with epidural bupivacaine hastened the onset of sensory, but not motor blockade and resulted in improved early postoperative analgesia in surgical patients.

References:

1. Cohen, et. al.: Epidural fentanyl/bupivacaine combinations for labor analgesia: effect of varying doses. Anesthesiology 1985; 65:A368.

2. Rucci, et. al.: Fentanyl and bupivacaine mixtures for epidural blockade. Br. J. Anaes. 1985; 57: 275-284.

3. Negre, I., et. al.: Ventilatory response to carbon-dioxide after intramuscular and epidural fentanyl. Anesth. Analg. 1987; 66: 707-710.

TIME OF ONSET OF BLOCK IN MINUTES

DOSE (ug) FENTANYL	DETECTABLE SENSORY BLOCK	SURGICAL ANESTHESIA (BILATERAL T8 BLOCK)	SACRAL BLOCKADE	MOTOR BLOCKADE
0	7.7	16.7	15.1	30.6
50	3.5**	10.9*	8.5*	34.0
100	4.5**	13.2	9.5*	30.1

* SIGNIFICANTLY DIFFERENT THAN CONTROL p<.05

** SIGNIFICANTLY DIFFERENT THAN CONTROL p<.01

TABLE 1

POSTOPERATIVE ANALGESIA

TIME TO REQUEST FOR PARENTERAL NARCOTICS (MINUTES)

DOSE FENTANYL (ug)	TIME (minutes)
0	160.6
50	167.5
100	267.0 *

* SIGNIFICANTLY DIFFERENT THAN CONTROL p<.05

TABLE 2