# POSTER SESSION VII

## A847

TITLE. PLACENTAL TRANSFER AND NEONATAL EFFECTS OF EPIDURAL FENTANYL-BUPIVACAINE FOR CESAREAN SECTION.

AUTHORS. U.Bang, M.D., H.S.Helbo-Hansen, M.D., P.Lindholm, M.D., N.A.Klitgaard, Lic. Pharm.

AFFILIATION. Anesthetic Dept., Odense University Hospital, DK - 5000 Odense Denmark.

Introduction. The addition of fentanyl, 1 μg/kg, to epidurally administered lidocaine 2% has been reported to improve the quality of analgesia during cesarean section, without affecting neonatal outcome (1).

Aim. The aim of the present study was to evaluate placental transfer and neonatal outcome following different doses of fentanyl added to epidurally administered bupivacaine 0.5% for cesarean section.

Methods. Having obtained approval by the local Ethical Committee and informed consent, 76 healthy women at term entered the study. The study was double blinded and the patients were randomly allocated to 4 groups of 19 to receive 20 ml of bupivacaine 0.5% with the addition of either 0, 50, 75 or 100 μg of fentanyl and saline to a total volume of 22 ml. Anesthesia to T4 was obtained in all patients by increments of bupivacaine 0.5%, as required. The condition of the newborn was assessed by Apgar Scores, and by the Neurologic and Adaptive Capacity Scores (NACS)(2). At delivery, blood samples were taken from maternal vein (Mv), umbilical cord artery (Ua) and vein (Uv). Plasma fentanyl was measured by radioimmunoassay with a limit of sensitivity of 0.030 ng/ml.

Results. The groups were comparable with regard to dose of bupivacaine, time from induction of anesthesia to delivery, and incidence of maternal hypotension. Apgar Scores, umbilical blood gases and acid-base status were normal, and similar in the 4 groups. When comparing NACS, the groups had similar numbers of neonates who obtained a good total score (between 35-40). There was no correlation between dose of fentanyl (μg/kg) and total NACS score (Fig). Ua fentanyl concentration was below the limit of sensitivity in 4, 3 and 1 neonates from the 50, 75 and 100 μg groups, respectively. The mean Ua/Mv ratio's were 0.32-0.43 (Table). Ua fentanyl were in all cases below those usually associated with respiratory depression (3).

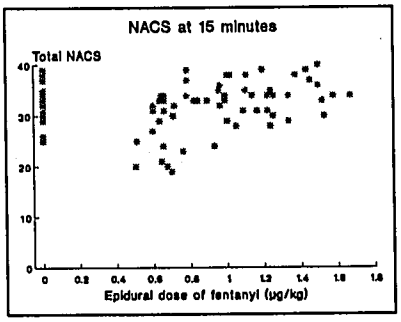


Table. Fentanyl concentration in maternal vein (Mv), umbilical vein (Uv) and umbilical artery (Ua). Values are mean±SD.

| | 50 μg (n=15) | 75 μg (n=15) | 100 μg (n=17) |
|---|---|---|---|
| Mv (ng/ml) | 0.103±0.028 | 0.141±0.055 | 0.200±0.044 |
| Uv (ng/ml) | 0.073±0.019 | 0.073±0.014 | 0.100±0.014 |
| Ua (ng/ml) | 0.052±0.019 | 0.053±0.015 | 0.067±0.017 |
| Ua/Mv | 0.43±0.32 | 0.34±0.22 | 0.32±0.16 |

Conclusion. Following epidural administration of fentanyl 50, 75 or 100 μg, fentanyl was detected in 84% of umbilical arterial samples, but concentrations were low and did not affect neonatal outcome.

References. 1. Anesthesiology 68: 938-943, 1988. 2. Anesthesiology 56: 340-350, 1982. 3. Br J Anaesth 54: 1087-1095, 1982

## A848

**Title:** EPIDURAL VS. INTRAVENOUS BUTORPHANOL FOR POST-CESAREAN DELIVERY ANALGESIA

**Authors:** B. Loferski, MD, WR Camann, MD, M Stone, MD, S. Datta, MD

**Affiliation:** Department of Anesthesia, Brigham and Women's Hospital, Harvard Medical School, Boston, MA 02115

A number of reports have investigated the analgesic efficacy of epidural butorphanol (EB). Although varying qualities of analgesia have been reported, a consistent finding is the occurrence of somnolence after EB. None of the previous studies have included a control group of patients receiving intravenous butorphanol (IVB). We sought to determine if the analgesia and side effects resulting from EB differed from IVB.

**Methods:** 25 ASA I term parturients undergoing elective cesarean delivery with epidural anesthesia consented to this institutionally approved protocol. All patients received lidocaine 2% with 1:200,000 epinephrine to obtain a surgical level of anesthesia to T2-T4. No opioids were administered during the surgical procedure. At exactly 60 minutes after the last dose of lidocaine, all patients received a simultaneous epidural (E) and IV injection. The control group (n=7) received normal saline both IV and E. Group IVB (n=10) received IVB 2 mg and epidural saline. Group EB (n=8) received IV saline and EB 2 mg. All injections were diluted to a final volume to 10 cc and administered in a double-blind, randomized fashion. When subsequent pain medication was requested, all patients received PCA with IV morphine (2 mg demand dose, 7 min lockout interval). VAS scores were assessed at 30, 60, 90, 120, 240 and 360 mins and morphine usage and side effects were assessed every 2 hours for 12 hr after the initial study injection. Statistical analyses consisted of Chi-square and ANOVA, with $P < 0.05$ considered significant.

**Results:** Demographic characteristics of the groups did not differ. Groups IVB and EB did not differ at any point for time to first PCA usage, cumulative morphine requirements at 2, 4, 6, 8 and 12 hrs, or VAS scores. However, both groups IVB and EB had significantly lower VAS scores for 120 mins after the study injection, and significantly lower morphine usage for 6 hrs after study injection, compared to the control group. The incidence of pruritus in the control group was 71% (5/7), group IVB 0% (0/9) and in group EB 25% (2/8). ($P = < 0.05$, IVB EB vs. control). The incidence of somnolence was 66% (6/9) in group IVB, and 14% (1/7) and 12% (1/8) in control group and EB, respectively. ($P = 0.01$, IVB vs. control or EB). Nausea occurred in 57% (4/7) in control group, but none in IVB and only 22% (2/9) in EB ($P = 0.03$, control vs. IVB or EB). Three patients in the control group (47%) had the PCA medication changed to meperidine approximately 4-6 hours after delivery owing to intractable pruritus. No patient in groups IVB or EB had any severe side effects attributable to the PCA morphine.

**Discussion:** These data suggest that the analgesic profile of epidural butorphanol, 2 mg is similar to that produced by intravenous butorphanol 2 mg. Both IVB and EB appear to be effective in reducing pruritus and/or nausea from PCA morphine, although IVB seemed to produce more somnolence than EB. The role of agonist-antagonist opioids such as butorphanol in regional anesthesia is still being investigated. The prevention of undesirable mu-opioid receptor specific side effects may ultimately prove to be the most useful adjunctive role for these agents[1-2].

**References:** 1. Baxter AD, et. al Canad J Anaesth 36:503-509, 1989.
2. Davies GG, From R. Anesthesiology 69:763-765, 1988.