A65 (Poster 24)

Is 0.1% Ropivacaine Equipotent to 0.06% Bupivacaine?: A Double-blinded, Randomized Study

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Two recent studies[1,2] suggest that the potency of epidural ropivacaine (R) is 60% that of bupivacaine (B). The present study compares patients' comfort level and motor block with the reported equipotent doses of epidural bupivacaine and ropivacaine.

Following informed written consent, 48 healthy, term, multiparous parturients in active labor were enrolled in this on-going double-blind, IRB-approved study. After a 3ml test dose with 1.5% lidocaine with 5μg/ml epinephrine, Group B received an initial 8ml bolus of 0.125% B + 100μg of fentanyl (F); followed by an infusion of 0.06% B and 0.0002% F at 12ml/hr. After a 3 ml test dose, group R received an initial 8ml bolus of 0.2% R + 100μg of F; followed by an infusion of 0.1% R and 0.0002% F at 12ml/hr. Every hour we recorded: cervical dilation, Visual Analog Scale (VAS) pain scores and motor block (Bromage Scale, BS). Data were analyzed using Chi-squared and Mann-Whitney U test with $p<0.05$ being significant.

One patient was excluded because of a protocol violation. VAS pain scores and BS values from the remaining 47 patients were analyzed. The study was stopped in two patients in group B and 1 patient in group R because of inadequate pain relief. Median VAS pain scores were similar in the two groups, initially (80, group B and 72, group R) and after the blocks were initiated (0, groups B and R). At complete cervical dilation, the median VAS pain score was 50 in group B (n=13) vs 2 in group R (n=14) ($p<0.02$). All patients in both groups had BS=4 at 10 cm dilation.

Our preliminary data show that the concentrations of bupivacaine and ropivacaine used in our study result in negligible motor block. However, ropivacaine offers better pain relief. We speculate that the reported potency values for bupivacaine and ropivacaine may not apply to all clinical settings.

References
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A66 (Poster 25)

Laparoscopic surgery in pregnancy – Is invasive monitoring essential?

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There is controversy in the literature whether capnography is adequate to monitor pulmonary ventilation to reduce the risk of significant respiratory acidosis in pregnant patients undergoing laparoscopic surgery.[1-4] Respiratory acidosis has been attributed as a possible cause of fetal losses following laparoscopic surgery.[4] Maternal and fetal acidosis occurred in pregnant ewes when capnography was used to guide ventilation during CO_2 insufflation.[3] In this prospective study, changes in arterial to end-tidal CO_2 difference induced by CO_2 insufflation were determined in pregnant patients undergoing laparoscopic cholecystectomy.

Methods: After institutional approval, rapid sequence general anesthesia was induced in eight parturients. CO_2 pneumoperitoneum was initiated after obtaining arterial blood for gas analysis. Pulmonary ventilation was adjusted to maintain $PETCO_2$ around 32 mmHg during the procedure. ABG analysis was performed during insufflation, after the termination of insufflation, following extubation, and in the postoperative period. Changes in cardiac output induced by CO_2 pneumoperitoneum were monitored noninvasively in four parturients using thoracic electrical bioimpedance cardiography.

MmHg Mean, SD	Pre-CO_2 Insuffltn.	During Inusffltn.	Post-Insuffltn	Post-Extub.	PACU
$PETCO_2$	32.1, 1.6	32.4, 1.1	32.7, 1.4		
$PaCO_2$	36, 3	36.6, 2.1	35.3, 3	39, 3.4	38, 3.5
$PaCO_2$-$PETCO_2$	3.9, 1.9	4.2, 1.6	2.8, 2		
PH	7.42,0.02	7.41,0.02	7.41,0.03	7.40,0.02	7.41,0.02

There was no significant change in $PaCO_2$, $PETCO_2$, $PaCO_2$-$PETCO_2$, and pH following CO_2 insufflation (ANOVA). However, the cardiac output decreased from 4.6 (0.6) to 4.1 (0.6) upon CO_2 insufflation (paired t-test). All parturients had uneventful progress of pregnancy except one patient (30 weeks gestation) who had transient mild uterine contractions without cervical effacement.

Conclusions: Capnography is adequate to guide ventilation during laparoscopic surgery in parturients. A $PETCO_2$ around 32 mmHg should allow $PaCO_2$ not exceeding a $PaCO_2$ that is usually encountered in the postoperative period following laparoscopic surgery. Thus, physiological consequences of pneumoperitoneum in pregnant patients are different from those in pregnant ewes.

References: 1 Anesthesiology 1997;87:6:1596. 2 Anesthesiology 1997;87:6:1597. 3. Anesthesiology 1996;85:1395. 4. Am J Surg 1996;171:435.

A67 (Poster 26)

COMPARISON OF EPIDURAL FENTANYL VERSUS EPIDURAL SUFENTANIL FOR EARLY LABOR AMBULATORY EPIDURALS

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INTRODUCTION: Epidural sufentanil, following a lidocaine with epinephrine test dose, has been shown to provide adequate analgesia and allows for ambulation during early labor. This study was designed to determine if an analgesic difference exists between epidural fentanyl and epidural sufentanil in laboring primiparous patients.

METHODS: Following IRB approval, 46 primiparous obstetrical patients <5 cm cervical dilation were evaluated. Following a 3 mL test dose of lidocaine with epinephrine, patients were randomized to receive either sufentanil 20 μg (S) or fentanyl 100 μg (F). VAS scores, side effects, and when additional analgesia was requested was recorded. Demographics - ANOVA, pain scores - Mann Whitney U, side effects - contingency testing, significance - $P<0.05$.

RESULTS: There were no significant demographic differences. All patients, (except one group S), achieved adequate initial analgesia. No significant pain score differences at any of the time intervals. Analgesic duration was similar between S (138±50min) and F (124±42min). Side effects were similar. Cervical dilation was significantly greater at the time of re-dose in group S ($p<0.003$). However, there was no significant differences with respect to the time from the initial dose to the time of achieving full cervical dilation: S (331±281min) and F (348±172min). No difference in C section (5 in S; 6 in F). No patient had a dural puncture or a PDPH. Apgar scores were comparable.

DISCUSSION: In early laboring patients, epidural fentanyl 100 μg after a lidocaine test dose provides analgesia comparable to that of sufentanil 20 μg. The mean analgesic duration of epidural fentanyl (124 min) and epidural sufentanil (138 min) in the present study compares favorably to previous studies of epidural labor analgesics. Whether the cervical dilation is indeed initially quicker with sufentanil (compared to fentanyl) and whether this has any clinical relevance (since the analgesia to fully dilated interval is not different) remains to be determined. When performing an ambulatory labor epidural, following lidocaine-epinephrine test dose we recommend the less expensive fentanyl.

A68 (Poster 27)

The Obstetric Anesthesia Clinic: Applying Technology to Facilitate QA

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BACKGROUND: Limited information is published concerning the implementation of outpatient Obstetric Anesthesia Clinics. This paper describes the process of creating, instituting, using and refining a database to facilitate the quality assurance process during the first year of operation of such a clinic.

METHODS: A database developer (DD) and multidisciplinary team collaborated to identify information of interest and organize database content. Specific questions were asked: 1) What are the population demographics served by the clinic? 2) What is the frequency of medical diagnoses and coexisting conditions? 3) Do patients have common questions and concerns regarding anesthesia and analgesia? 4) Is the clinic run efficiently? and, 5) Are patients satisfied with the service? A review of existing software was conducted and a relational database program (MS Access) was selected.[1] The DD created the database structure and on-screen data entry forms. The database resides on the hospital network. Clinic nurses were trained in data entry. Quality assurance data checks were conducted on a monthly basis. A volunteer assisted with follow-up telephone calls to assess patient satisfaction.

RESULTS: Data were entered prospectively on all 207 low-risk and 103 high-risk patients assessed. This represented ~ 8% of all women delivered that year. Data analysis was carried out after 6 months and 1 year of clinic operation. Medical conditions of 50% of high-risk referrals were categorized as hematological, musculoskeletal or cardiac. Identification of these conditions guided creation of resource and teaching files. Surprisingly, 36% of low-risk patients had significant disease with implications for anesthesia. Patient questions were itemized and summarized. This led to focussed teaching in the clinic and the development of 4 anesthesia/analgesia information pamphlets. Efficiency of the clinic improved in the second 6 months of operation. Appropriate scheduling of patients to low (nurse-directed) or high (anesthesia-directed) risk clinic was facilitated by educating the referral base (Obstetricians and Family Doctors) as to the meaning of anesthetic risk. Adjustment of booking times, prompt medical chart retrieval, accelerated transcription services, and simplifying the referral request form minimized patient waiting time. Feedback from patients was overwhelmingly positive.

CONCLUSIONS: The database was a useful tool for assessing the program, guiding change, and improving the design of the Obstetric Anesthesia Clinic.

REFERENCES: 1) Pace 19:1112-6, 1996.