A25
Efficacy of Nalmefene for the Treatment of Intrathecal Opioid Induced Pruritus
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Introduction: Pruritus is the most common side effect following administration of opioids. It is likely due to release of endogenous opioids (opioids) and naloxone is short acting and clinical reports on reversal of analgesia are controversial.(1,2) Nalmefene, a long acting mu opioid antagonist, has recently been shown to effective antagonize L.T. morphone induced itch in an animal model.(3) The aim of this study was to determine the efficacy of nalmefene for the clinical treatment of L.T. morphine induced itch and assess its safety.

Methods: ASA 1 or 2 patients scheduled for primary or repeat cesarean section who selected spinal anesthesia with L.T. morphine for postoperative analgesia were enrolled in this double-blinded, up-down, sequential allocation study. All patients received 11.25 mg hyperbaric bupivacaine with 0.25 mg morphine for surgical anesthesia. Patients reporting moderate/severe itch and requesting treatment for pruritus received i.v. nalmefene. The dose was determined by the response of the previous patient to a higher or lower dose. Anti-pruritic efficacy and appropriate response was assessed hourly using a verbal (none, mild, moderate, or severe) and numeric (0-100mm) pruritic score (PS) and 100 mm visual analogue pain scale (VAPS). Efficacy was defined as a verbal PS of none/mild for 6 hours following i.v. nalmefene. The effective doses in 50% and 95% of subjects (ED50, ED95) were determined using the up-down method of independent pairs.

Results:

<table>
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<tr>
<th>Point Estimate</th>
<th>95% Confidence Interval</th>
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<tr>
<td>ED50</td>
<td>0.41 ug/kg</td>
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<tr>
<td>ED95</td>
<td>0.82 ug/kg</td>
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<td>0.19, 1.57</td>
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There was no significant difference in pre and post nalmefene VAPS for 6 hours using paired Student’s t test.

Conclusions: The ED50 for nalmefene was estimated at 0.41 ug/kg with ED95 at 0.82 ug/kg. Efficacy and appropriate response was assessed hourly using a verbal (none, mild, moderate, or severe) and numeric (0-100mm) pruritic score (PS) and 100 mm visual analogue pain scale (VAPS). Efficacy was defined as a verbal PS of none/mild for 6 hours following i.v. nalmefene. The effective doses in 50% and 95% of subjects (ED50, ED95) were determined using the up-down method of independent pairs.


A26
Does a test dose increase the likelihood of identifying intrathecal placement of epidural catheters during caesarean section?
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Introduction: Unintentional intravascular (IV) or intrathecal (IT) catheter migration may occur during administration of epidural analgesia for labor. Catheter aspiration (ASP) and test doses (TD) have been used to establish correct placement. Recently, controversy has developed regarding the efficacy of TD for intravascular catheters. However, the efficacy of TD to detect IT migration has not been addressed. The purpose of this investigation was to compare the accuracy of both tests in identifying IT multi-occluded epidural catheters.

Methods: Anesthetic management was prospectively standardized. Multi-occluded epidural catheters were inserted 5 cm into the epidural space and were followed by aspiration and administration of a 3 cc test dose of lidocaine 1.5% plus epinephrine. Incidence of IT catheter placement as detected by ASP and TD was obtained from the computerized quality assurance database and anesthesia records for 1998. Since TD and ASP were performed on the same population of patients, McNemar chi square was used to compare the ability of these tests to detect IT catheter placement.

Results: Of the 20 epidurals performed, 10 catheters were detected as being IT by TD, whereas only 5 of these 10 catheters had been detected by positive aspiration. As diagnostic imaging (the “gold standard”) was deemed inappropriate in these parturients, sensitivity and specificity for these tests were not applicable. When TD and ASP were compared, TD was found to have detected more IT catheters than ASP alone (p<0.05).

Discussion: Our results indicated that a test dose is advantageous in detecting IT catheters that may be missed by aspiration alone. It has been suggested that patients receiving dilute epidural infusions of local anesthetic plus opioid solution will gradually develop a high sensory and motor block, and thus detection of the IT catheter is not problematic. However, laboring women frequently receive a bolus of higher concentrations of local anesthetics when operative delivery ensues. Although IT catheter migration occurs less frequently than IV migration, this occurrence can be just as serious should the unidentified IT catheter be subsequently used for cesarean section.


A27
Potency And Sterility Of Anesthetic Drugs In Obstetrical Setting
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The goal of this study was to evaluate the sterility and potency over time of commonly used anesthetic drugs in an obstetrical practice area. Current practice involves the daily preparation of medications drawn up into syringes and dated with a 24-hour expiration date. Multiple studies have examined sterility issues independent of potency. Cost implications arise not only with the cost of labor preparation time, but also of wastage.

Syringes were collected on a daily basis over a 30-day period in our obstetric anesthesia area. The medications evaluated in this study were succinyl choline, atropine, lidocaine, and ephedrine. A total of 86 syringes prepared by various personnel utilizing a variety of techniques were collected and stored at room temperature conditions. Random samples were taken of each of the four medications from each week during a 30-day period. Sterility of the samples was assessed for both aerobic and anaerobic growth. Samples were prepared using 5% sheep blood and incubated aerobically in 5% CO2 for 5 days followed by 3 days at room temperature. The other half was placed on laboratory prepared laked blood agar plates which uses a brain-heart infusion agar base supplemented with 6% laked sheep Rbc’s, yeast extract, trypticase peptone, vt K1, and hemin, and incubated in an anaerobic chamber at 35°C for 7 days. No viable growth was observed on any of the filter surfaces for the 30 day time period. Potency was quantified utilizing an HPLC assay comparing a sterile solution of each medication product to one of each sample medication that was 30 days old. Only a 30-day sample was analyzed due to the cost of running multiple samples.

These preliminary results indicate that in general practice, succinyl choline, atrpopine, ephiadrine, and lidocaine are stable for long periods of time without evidence of bacterial growth. This suggests that extension of the generally accepted 24-hour expiration dating of external medications could be translated into health care dollar savings. If one could assure accurate labeling practices, as to date and time of medication preparation, a long range cost savings system could be established in a variety of practice areas.


A28
Local Anesthetics Given Epidurally Can Inhibit Growth of Staphylococcus aureus at Clinically Significant Concentrations
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Introduction: Local anesthetics have been shown to have antibacterial effects, especially at high concentrations. Fortunately, Staphylococcus aureus, a common cause of epidural abscess, is sensitive to these agents. This study clarifies which concentrations of local anesthetics would be expected to inhibit the growth of Staphylococcus aureus.

Methods: After IRB approval, serial dilutions were made of 0.75% and 0.5% bupivacaine, 2% and 5% lidocaine and 3% chloroprocaine. The 0.75% bupivacaine and 5% lidocaine were hyperbaric spinal medications that included 8.25% and 7.5% dextrose, respectively. To each concentration of local anesthetic solution, an equal volume was added of a mixture of Mueller Hinton broth medium with an inoculum of Staphylococcus aureus at a concentration of 5 x10^8 organisms/ml. The resulting solutions were incubated and then observed for growth 24 and 48 hrs later.

Results: After 24 hrs, inhibition of growth was seen with 0.19% and 0.38% bupivacaine starting with the 0.75% solution, and 0.25% with the 0.5% solution. Lidocaine inhibited growth at 1.25% and 2.5% starting with the 5% solution, and at 1% with the 2% solution. Chloroprocaine could inhibit growth at as low a concentration as 0.75%. The 0.19% concentration of bupivacaine and the 1% concentration of lidocaine showed late growth at the 48hr checks. Therefore, the minimum inhibitory concentrations of the local anesthetics were assumed to be 0.25% bupivacaine, 1.25% lidocaine and 0.75% chloroprocaine.

Conclusion: Local anesthetics can protect against epidural abscess formation if they are used at high enough concentrations. This effect may help explain the very low reported incidence of epidural abscesses.