38998 - A RANDOMISED CONTROLLED TRIAL OF EPIDURAL VOLUME EXTENSION DURING A COMBINED SPINAL-EPIDURAL TECHNIQUE FOR LABOUR ANALGESIA

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Introduction: Combined spinal-epidural (CSE) is a popular method for delivering labour analgesia due to rapid onset of profound analgesia, minimal motor blockade, and high patient satisfaction. Epidural volume extension (EVE) involves injection of volume into the epidural space compressing the dural sac, causing cephalad shift of the cerebral spinal fluid (CSF). Our hypothesis is that EVE with 10 ml of normal saline during CSE will increase the anesthetic sensory block height, decrease pain scores, decrease pain scores more rapidly, and decrease motor block compared to performing CSE without EVE.

Methods: An apriori sample size was calculated. With institutional REB approval and written informed consent, we recruited 54 healthy term labouring nulliparous parturients with cervical dilation < 5 cm. Intrathecal analgesia consisted of 2 mg bupivacaine and 10 mcg fentanyl. The subjects were randomly allocated into one of two groups: EVE received 10 ml of normal saline through the Tuohy needle prior to catheter insertion or NEVE where parturients did not receive EVE. Epidural catheters were thread 5 cm into the epidural space and a standard continuous epidural infusion was begun immediately. A blinded researcher assessed sensory dermatome level by blunt pinprick test, analgesia by numeric rating scale (NRS) 0 to 10, and motor blockade with a m-Bromage score 1 to 6 at 2.5 min intervals. The primary outcome measure was the difference in sensory dermatome level as determined by non-traumatic pinprick test.

Results: Refer to table 1 for results. A total of 54 parturients were enrolled. There was no significant difference in demographic criteria. There was no significant difference in peak dermatome levels at 15 min or 30 min between groups. The time to peak dermatome was also not significant between groups. There was no difference in the minimum pain score, nor the time to minimum pain score between groups. The number of parturients with a Bromage score less than 6 was less in Group EVE, but this too was not statistically significant.

Discussion: To our knowledge, this is the first clinical trial to study the effect of EVE for labour analgesia in parturients. We did not find a significant difference between groups with regards to sensory dermatome level nor pain scores when using EVE. Although there is a trend toward less motor block in Group EVE, this was not statistically significant. Our study demonstrates that EVE does not offer superior analgesia when using a CSE technique for parturients requesting labour analgesia, but any effect on long-term catheter function was not assessed in this study.

References:
<table>
<thead>
<tr>
<th>Measure</th>
<th>No EVE (n = 28)</th>
<th>EVE (n = 26)</th>
<th>p-value</th>
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<tr>
<td>Age (years)</td>
<td>27.4 ± 4.4</td>
<td>25.5 ± 3.7</td>
<td>0.0933</td>
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<tr>
<td>BMI (kg/m²)</td>
<td>29.8 ± 3.4</td>
<td>29.3 ± 3.1</td>
<td>0.5899</td>
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<tr>
<td>Cervical dilation at CSE (cm)</td>
<td>3.5 (1, 4)</td>
<td>3.5 (2, 4)</td>
<td>0.9517</td>
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<td>Pain score prior to CSE (0 – 10)*</td>
<td>9 (5, 10)</td>
<td>9 (5, 10)</td>
<td>0.5139</td>
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<tr>
<td>Peak dermatome 15 min</td>
<td>T6.5 (T4, L4)</td>
<td>T6 (T1, L2)</td>
<td>0.2234</td>
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<td>Peak dermatome 30 min</td>
<td>T6 (T2, L4)</td>
<td>T5.5 (T1, L1)</td>
<td>0.7589</td>
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<td>Time to peak dermatome (min)</td>
<td>20 (0, 30)</td>
<td>15 (2.5, 30)</td>
<td>0.8266</td>
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<td>Minimum pain score (0 – 10)</td>
<td>0 (0, 5)</td>
<td>0 (0, 7)</td>
<td>0.1958</td>
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<tr>
<td>Time to minimum pain (min)</td>
<td>2.5 (0, 25)</td>
<td>2.5 (0, 25)</td>
<td>1.0000</td>
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<tr>
<td>Peak Bromage score (1 – 6)</td>
<td>6 (4, 6)</td>
<td>6 (5, 6)</td>
<td>0.0636</td>
</tr>
<tr>
<td>Bromage score &lt; 6</td>
<td>9 (32.1%)</td>
<td>3 (11.5%)</td>
<td>0.1029</td>
</tr>
</tbody>
</table>

Data presented as mean ± SD, median (range), or n (%)

*n = 25 for EVE group for this measure
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Introduction: Practice guidelines for the use of epidural mixtures have changed significantly since the introduction of the concept of minimum local anesthetic concentration (MLAC) (1). Classic MLAC studies have established EC50 for various drugs, and clinically useful concentrations – EC90 or EC95 – have been mathematically derived from those findings. Furthermore, MLAC studies have been performed with a fixed volume of 20 ml. Epidural anesthesia is known to depend on both the concentration and the volume of the solution (2). It is fair to assume that each epidural mixture will vary in the minimum volume required for its efficacy. In 2007 our group set out to explore the concept of effective volume 90% (EV90) of bupivacaine 0.125% (3). We calculated the EV90 at 13.8 mL (95% CI: 12.2-18.3). It remains unknown how the addition of fentanyl to the bupivacaine solution, and the different test doses preceding the loading dose, will affect its required volume. The objective of this study is to determine the EV90 of a loading dose of 0.125% bupivacaine-fentanyl 5mcg/ml, following test doses with 3 ml of either 2% lidocaine or 0.125% bupivacaine-fentanyl 5mcg/ml.

Methods: REB approval and patient written consent was obtained for this study. 80 patients requesting epidural analgesia for labor pain are being randomized into two groups: lidocaine test dose or bupivacaine-fentanyl test dose. The loading dose consists of bupivacaine 0.125% with fentanyl 5mcg/ml. A double-blind biased coin up-and-down design is being used to determine the EV90 for the two groups. We include ASA/II laboring women at term; regular contractions with VNRS > 5 (0-10); cervical dilatation < 5cm; regular uterine contractions every 3-5 min. After placement of an epidural catheter at L3-4, a test dose is given with either 3 ml of lidocaine 2% or 3 ml bupivacaine 0.125%-fentanyl 5mcg/ml. After assessment of the test dose at 3 minutes, the loading volume is given according to the biased coin up-down method. The initial volume in each group was set at 10 ml. The volume for the subsequent patient is determined by the response of the previous patient: if the volume fails, the next patient has the volume increased; if the volume succeeds, the next patient has the volume reduced with a 1/9 chance, otherwise it remains the same. The in-/decrements are of 2 mL, with minimum and maximum volumes of 4 and 16 ml. Success is defined as VNRS ≤ 1 (VNRS 0-10) at 20 min after injection of the loading dose. Hypotension (SBP < 20% from baseline) in combination with nausea, vomiting or fetal bradycardia is treated with ephedrine 5 mg IV. Secondary outcomes are block characteristics at 20 min (sensory, motor) and hypotension (SBP < 20% from baseline values). The EV90 will be estimated for each of the two groups using the Dixon and Mood method (4).

Results: We started recruitment on the 24th of October 2013. We have approached 50 women and enrolled 35 of which 3 were excluded (2 protocol violations, 1 failed epidural). With a recruitment rate of 70%, we expect recruitment to be completed by the end of April 2014.

Discussion: This study will determine the EV90 of bupivacaine 0.125% with fentanyl 5mcg/mL to initiate epidural analgesia in labor, following test doses of either lidocaine 2% or bupivacaine 0.125%.

References:
39178 - LOW-MOLECULAR WEIGHT HEPARIN AND THROMBOELASTOGRAPHY IN PREGNANCY

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Background: Low-molecular weight heparin (LMWH) is often used for either prophylaxis or treatment of venous thromboembolism (VTE). Anti-Xa assays can be used as a surrogate for LMWH activity, but there is a lack of consistency between bleeding complications and Anti-Xa levels\(^1\). Due to the physiologic changes in pregnancy, weight-based dosing may underestimate the dose requirement of LMWH. TEG is a point-of-care, real-time technique that may be used to monitor the anti-coagulant effects of LMWH in pregnancy. The aim of this study is to determine if there is a dose-dependent change in TEG parameters when serial doses of LMWH are added \textit{in vitro} to whole blood samples from term pregnant women. The cut-off value for the TEG parameter that can best identify anti-coagulated samples with the highest negative predictive value (NPV) is also determined.

Methods: Following approval by local ethic board, ASA I or II parturients presenting for elective caesarean delivery were recruited. Whole blood was collected before delivery and normal saline or dalteparin were added to yield final concentrations of 0 (control), 0.05U/ml, 0.25 U/ml, 0.5 U/ml, 0.75 U/ml and 1.0 U/ml anti-Xa activity. TEG tracings were obtained for all six samples using the standard kaolin protocol. TEG parameters obtained include \(r\) time, \(k\) time, alpha angle and maximum amplitude (MA). Groups were compared using pairwise comparison procedure (Dunn’s method) and receiver operating characteristics (ROC) curves were created for TEG parameters.

Results: 30 parturients were recruited. Samples containing \(\leq 0.05\text{U/mL}\) anti-Xa activity were considered “normal”, and \(\geq 0.25\text{U/mL}\) anti-Xa activity were deemed “anti-coagulated”. There was a statistically significant difference in median TEG \(r\) time, \(k\) time, alpha angle and MA between normal \((\leq 0.05 \text{ U/ml})\) and samples \(\geq 0.5\text{U/mL}\) \((P<0.05)\). The ROC curves (Fig 1) for TEG \(r\) and \(k\) yielded an AUC of 0.99 and 0.94 respectively, showing that these two parameters were most useful at detecting the presence of anti-coagulation in whole blood samples. TEG \(r\) time showed a dose-dependent response to increasing LMWH concentrations.

Conclusion: Our pilot study shows that it may be feasible to utilize TEG to detect the presence of LMWH in maternal whole blood. TEG \(r\) time is the most sensitive and specific parameter for detection of LMWH. From the ROC curve, the \(r\) time cut-off of 6.1 min yielded the best combined sensitivity and specificity. At this value, the NPV for detecting anticoagulated samples was 95%. This can potentially translate to a point-of-care test that can be used to determine real-time coagulation status in patients and safety of neuraxial techniques.

References:
ROC Curves, k and r, 60 normals

Sensitivity

1 - Specificity

TEG r, A = 0.99
TEG k, A = 0.94
Introduction: Peripartum hemorrhage remains a major cause of maternal morbidity and mortality. The incidence of peripartum hemorrhage appears to be increasing in developed countries due to an increased number of placenta accreta or percreta after previous cesarean deliveries. Tranexamic acid (TXA) has been proposed to prevent peripartum hemorrhage. We conducted a systematic review to assess the effectiveness and safety of TXA in decreasing cesarean bleeding.

Methods: All randomised controlled trials of TXA given to prevent bleeding during cesarean delivery were included in this review. We searched multiple electronic databases and the reference lists of eligible trials. The last database search was conducted on 12th December 2013. There was no language restriction imposed on the search. The keywords used for the search were (blood) and (loss or transfusion or hemorrhage or haemorrhage) and (cesarean or caesarean or caesarian or c-section or c-section) and (tranexamic or cyklokapron or lysteda). The databases searched included PubMed/Medline (25), Embase (90), Cochrane (12), CINAHL (2) giving a total of 129 eligible articles of which 97 were included in the preliminary assessment of eligibility after excluding duplicates. Of these, we deemed 10 full papers and 2 abstracts met all our requirements. Authors of all the trials had obtained ethical approval according to local guidelines. Two authors extracted data independently from these trials. Methodological quality was assessed by two other authors. The primary outcome was blood loss. Secondary outcomes were blood transfusion, hysterectomy, mean hemoglobin concentration, thromboembolic events and other adverse effects. Meta-analysis will be performed using RevMan software.

Results: We identified 12 randomised controlled trials involving 2678 participants. 1335 women received TXA. The trials compared TXA with no treatment or placebo and reported blood loss during and after cesarean delivery. They also reported on blood transfusion requirements, postoperative hemoglobin and hematocrit levels, thrombo-embolic events and mild complications. 9 trials used 1 gram TXA prior to skin incision and 3 trials used 10 mg/kg TXA prior to skin incision. The administration of TXA was associated with significantly reduced blood loss, reduced transfusion requirements and higher postoperative hemoglobin concentrations and no serious side effects or complications were reported.

Discussion: Tranexamic acid may reduce blood loss during and after cesarean delivery. However, the quality of the currently available evidence is limited. Adequately powered, high quality randomized controlled trials are needed.

References:
1. Int J Gynecol Obstet 2011; 115(3): 224-226
Introduction: Lumbar cerebrospinal fluid volume measured by magnetic resonance imaging (MRI) bears an inverse correlation with the intrathecal spread of anesthetic solutions.1 While MRI is a valuable research tool, it cannot be used at bedside to guide clinical practice. Ultrasound (US) is a practical bedside resource used to facilitate spinal and epidural anesthesia. A previous study using one standard dose of bupivacaine determined that US measurements contribute to predict the intrathecal spread during CSE analgesia for labor.2 We hypothesized that the predictive model could be improved by studying a dose range of bupivacaine in conjunction with dural sac dimensions and patient’s characteristics.

Methods: We obtained REB approval and consent for study participation in this randomized, double-blind controlled trial. We recruited women with singleton term pregnancies requesting neuraxial analgesia while in labor. US imaging was performed with a 5-2 MHz curved array probe in the left paramedian sagittal plane at levels L5-S1 to L1-L2. We measured the dural sac width (DSW) at each lumbar interspace; the lumbar dural sac length (DSL: distance between L5-S1 and L1-L2 interspaces); and the vertebral column length (VCL: distance from C7 prominence to L5-S1 interspace). (Figure1) The lumbar dural sac volume (DSV) was subsequently calculated, assuming the spinal canal being a cylinder with a diameter equal to the mean value of the 5 DSW measurements. CSE analgesia was induced with one of 3 doses of 0.25% bupivacaine: 1.5 mg, 2 mg or 2.5 mg – in association with 15μg fentanyl. Sensory block levels (SBL) to ice and pinprick (60g Von Frey filament) were assessed at 5, 10, 20, and 30 min. We used mixed effect models for repeated measures to examine the association of SBL to ice or pinprick with dose, time and patient characteristics. A predictive model was constructed by multiple linear regression to examine the peak SBL considering dose, patient characteristics, and US measurements as covariates.

Results: We recruited 60 women (20/dose group). Height, weight, and BMI: mean (SD) of 161.8(6.5) cm, 75.5(11.2) kg, and 28.8(3.8) kg/m². Mean DSW, DSL, VCL and DSV were 1.2 cm, 11.4 cm, 51.5 cm and 14.6 cm³ respectively. The median peak SBL for 1.5, 2.0 and 2.5 mg were reached at 20 min: T6, T5, T4 (ice) and T8, T7, T6 (pinprick), respectively. We found significant covariates for the predictive model that includes positive correlation for dose, BMI and inverse correlation for the DSW.

Discussion: We constructed a predictive model of peak SBL that includes the dose, BMI and DSW obtained by bedside US evaluation of dural sac dimensions. This may assist in predicting block levels in patients undergoing CSE for labor. Our findings represent another step toward the understanding of the pharmacology of spinal anesthesia.

References:
1) Anesthesiology 2004; 100: 106-114
**39258 - EXTERIORISATION COMPARED TO IN SITU UTERINE REPAIR FOR CESAREAN DELIVERY: A SYSTEMATIC REVIEW AND META-ANALYSIS**

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**Introduction:** Cesarean delivery (CD) is one of the most common surgical procedure performed in the world. The optimal surgical technique to limit maternal morbidity is debatable. One aspect of this debate relates to the method of uterine repair following delivery. Proponents of uterine exteriorisation (UE) claim better surgical visualisation, faster repair, and better control of hemostasis, whereas those who favour in situ repair are concerned about uterine traction causing nausea and vomiting, pain, and hemodynamic instability, as well as trauma and infection to the surrounding structures. Therefore, we performed a systematic review of randomised controlled trials to compare UE versus in situ repair during CD on maternal complications.

**Methods:** The systematic review adhered to PRISMA guidelines. CENTRAL, MEDLINE (PubMed), EMBASE, and CINAHL were systematically searched. The MeSH term for CD and its different spellings were combined with text searches for “repair”, “uterus”, “exteriorisation”. The results of these searches were combined with a sensitive methodological filter for randomised trials, meta-analyses, and systematic reviews. All published randomised controlled trials involving a comparison of in situ uterine repair during CD compared to UE were included. Primary outcomes sought included incidence of intraoperative complications (nausea, vomiting, pain), blood loss (reduction in hemoglobin, estimated blood loss) and postoperative infection (endometritis, wound infection). Secondary outcomes included operative time, hospital stay, blood transfusion, fever, postoperative pain, and return of bowel function. Studies were included if they reported any of the primary outcomes.

**Results:** Refer to table 1 for summary of results. Sixteen manuscripts were selected for in-depth full-text review, from which 14 manuscripts were deemed low-risk of bias and included in this systematic review. A total of 9077 subjects underwent UE, while 9054 subjects had in situ repair. Pooled results of the two repair techniques did not show a difference in intraoperative nausea, nor intraoperative vomiting. The data for intraoperative pain is inadequate to reach a conclusion due to the wide confidence intervals. Analysis of drop in hemoglobin revealed no significant difference between repair techniques. Although there was a tendency to favour UE for estimated blood loss, this difference was not statistically significant. Endometritis pooled results showed a statistically significant difference favouring in situ repair. There was no difference in wound infection between the two repair techniques. There was a statistically significant difference favouring in situ repair for return of bowel function. Additional outcomes such as operative time, hospital stay, blood transfusion, fever, postoperative pain, and return of bowel function were included if they reported any of the primary outcomes.

**Discussion:** In contrast to an earlier systematic review, we found that in situ repair may be associated with less endometritis and faster return of bowel function. More well conducted randomised controlled trials are needed that focus specifically on intraoperative complications such as nausea, vomiting and hemodynamic instability.

**References:**  
1. Cochrane Database Syst Rev 2004 4: CD000085  
<table>
<thead>
<tr>
<th>Analysis</th>
<th>Number of RCTs n = 14</th>
<th>Exteriorisation patients n = 9077</th>
<th>In Situ patients n = 9054</th>
<th>Odds Ratio (OR) or Mean Difference (MD)</th>
<th>p-value</th>
<th>Heterogeneity</th>
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<tbody>
<tr>
<td>Intraoperative Nausea</td>
<td>4</td>
<td>534</td>
<td>537</td>
<td>OR 1.14; 95% CI [0.70, 1.87]</td>
<td>0.60</td>
<td>50%</td>
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<tr>
<td>Intraoperative Vomiting</td>
<td>4</td>
<td>536</td>
<td>539</td>
<td>OR 1.10; 95% CI [0.65, 1.83]</td>
<td>0.73</td>
<td>33%</td>
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<tr>
<td>Intraoperative Pain</td>
<td>3</td>
<td>213</td>
<td>226</td>
<td>OR 1.57; 95% CI [0.91, 2.74]</td>
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<tr>
<td>Drop in Hemoglobin (g/dL)</td>
<td>5</td>
<td>3297</td>
<td>3288</td>
<td>MD -0.14; 95% CI [-0.31, 0.04]</td>
<td>0.13</td>
<td>85%</td>
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<tr>
<td>Estimated Blood Loss (ml)</td>
<td>6</td>
<td>454</td>
<td>454</td>
<td>MD -61.03; 95% CI [-127.34, 5.28]</td>
<td>0.07</td>
<td>76%</td>
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<tr>
<td>Endometritis</td>
<td>7</td>
<td>8340</td>
<td>8320</td>
<td>OR 1.40; 95% CI [1.08, 1.81]</td>
<td>0.01</td>
<td>44%</td>
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<tr>
<td>Wound Infection</td>
<td>8</td>
<td>8096</td>
<td>8092</td>
<td>OR 1.07; 95% CI [0.60, 1.89]</td>
<td>0.83</td>
<td>89%</td>
</tr>
<tr>
<td>Return of Bowel Function</td>
<td>3</td>
<td>2739</td>
<td>2734</td>
<td>MD 3.16; 95% CI [1.05, 5.27]</td>
<td><strong>0.003</strong></td>
<td>92%</td>
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<tr>
<td>Operative Time (min)</td>
<td>12</td>
<td>8551</td>
<td>8534</td>
<td>MD 0.61; 95% CI [-2.70, 3.91]</td>
<td>0.72</td>
<td>99%</td>
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<tr>
<td>Hospital Stay (days)</td>
<td>8</td>
<td>8084</td>
<td>8077</td>
<td>MD 0.15; 95% CI [-0.11, 0.41]</td>
<td>0.25</td>
<td>98%</td>
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<tr>
<td>Blood Transfusion</td>
<td>9</td>
<td>8288</td>
<td>8280</td>
<td>OR 1.02; 95% CI [0.43, 2.42]</td>
<td>0.96</td>
<td>56%</td>
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<tr>
<td>Fever</td>
<td>5</td>
<td>5305</td>
<td>5305</td>
<td>OR 1.03; 95% CI [0.73, 1.44]</td>
<td>0.88</td>
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</table>
Introduction: Pulmonary aspiration of gastric content is one of the most feared complications in obstetric anesthesia. Bedside gastric ultrasonography (US) can be reliably performed by anesthesiologists 1 to assess gastric content in the perioperative period, 2 and may be useful in risk assessment and clinical management. We aimed to describe the qualitative and quantitative US assessment of the gastric antrum in fasted pregnant women.

Methods: We obtained REB approval and consent for study participation in this prospective, descriptive study in non-laboring pregnant women at term scheduled for elective cesarean delivery. Subjects were examined after a minimum period of overnight fasting (solid food -8 hrs; clear fluids -2 hrs) and prior to the cesarean delivery. Two anesthesiologists performed a standardized scanning protocol of the gastric antrum: subjects on a 45-degree semi-recumbent position, first supine and then in the right lateral decubitus (RLD), using a 2-5 MHz curvilinear array transducer in a sagittal to right parasagittal plane on the epigastric area. Based on the qualitative assessment of the antrum, subjects were classified following a 3-point grading system 2: grade 0, the antrum appears empty; grade 1, small fluid volume only seen in RLD suggesting residual gastric secretions; and grade 2: larger fluid volume seen both in supine and RLD. In addition, quantitative assessment was performed using 3 still images of the antrum at rest (between peristaltic contractions) in RLD to measure the cross-sectional area (CSA) with aid of the built-in caliper (Figure 1).

Results: We have recruited 40 of the 110 planned subjects. Age, height, weight, BMI, and gestational age: mean (SD) of 35.6(5) years, 163.1(8.2) cm, 79.1(15.3) kg, and 29.6(4.7) kg/m², 38.6(0.9) weeks. Fasting period for solid food and clear fluids: median (IQR) of 13(3) and 3.75(6.5) hours. Qualitative assessment: grade 0 (18/40, 45%), grade 1 (22/40, 55%), grade 2 (0%). Quantitative assessment, mean (SD) [min-max] of CSA in RLD: 4.71(2.1) [1.8-9.7] cm². The qualitative grading system showed significant differences for the CSA in RLD: grade 0= 3.11(0.8) cm²; and grade 1=6.09(1.8) cm²; p-value<0.0001. There was no correlation between hours of fasting and CSA or qualitative grade.

Discussion: All women in our study presented with antral CSA compatible with residual gastric fluid. 3 Furthermore, applying the predictive model obtained in non-pregnant population, 4 our subjects presented with gastric volumes no greater than 110 ml. The qualitative 3-point grading system may be used to assess individual risk of perioperative gastric content aspiration. The quantitative measurement of antral CSA is a promising tool for predicting gastric fluid volume.

References:
1) CJA 2013; 60: 771–779
2) Anesth Analg 2011; 113: 93–97
3) BJA 2014, Jan 8.
Introduction: One small RCT suggested a benefit from a preoperative dose of 600 mg gabapentin in reducing postcesarean pain in the context of spinal anesthesia and a multi-modal analgesic regimen inclusive of intrathecal morphine (1). A subsequent RCT, designed to find the optimal dose, cast some doubt on this finding and suggested that a larger study was required (2). Based on these trials and following a trend in the literature, we hypothesized that a perioperative course of gabapentin would reduce postcesarean pain.

Methods: REB approval, Health Canada approval and patient informed consent was obtained for this study. Healthy women scheduled for elective cesarean delivery performed under spinal anesthesia with 1.6-1.8 ml of 0.75% hyperbaric bupivacaine, 10 mcg fentanyl and 100 mcg morphine were randomized to receive a perioperative course of either gabapentin or placebo. The dosing in the treatment group consisted of a preoperative dose of 600 mg gabapentin followed by a 48 hour postoperative course of 200 mg three times a day. Both groups received a standardized regimen of regular oral acetaminophen and diclofenac. Parenteral morphine was administered as required. Postoperative pain, at rest and on movement, and satisfaction were measured on a visual analogue scale (VAS 0-100 mm) along with opioid consumption and side effects at 24 and 48 hours after the incision. Neonatal outcomes were APGAR scores, need for resuscitative support, umbilical blood gases and breast feeding difficulties. Telephone interviews were conducted at 2 and 6 weeks to assess for persistent pain. The primary outcome was pain on movement at 48 hours postoperatively.

Results: 204 women were randomized, 17 were excluded and 187 were analyzed. There was no difference in VAS pain scores on movement at 48 hours between groups (mean [SD]): gabapentin 33.6 [21.2] vs. placebo 35.6 [24.5], p=0.54). However, there was a significant reduction in VAS pain scores at rest (12.2 [16.3] vs. 18.3 [17.6], p=0.015) and on movement (39.0 [21.6] vs. 46.9 [23.1], p=0.016), and greater satisfaction scores (mean [SD]: 87.9 [15.8] vs. 77.5 [22.2], p=0.003) at 24 hours in the gabapentin group. The number [%] of patients receiving additional parenteral opioids in the first 24 hours was significantly lower in the gabapentin group (17 [17.7] vs. 29 [31.9], p=0.025). There was a significant increase in the incidence of sedation in the first 24 hours (55.2% vs. 39.6%, p=0.032) in the gabapentin group. There was no difference in neonatal outcomes between the groups. There was no difference in pain scores at 2 weeks postpartum. Results for pain at 6 weeks postpartum still pending.

Discussion: A perioperative course of gabapentin reduces pain and opioid consumption in patients undergoing cesarean delivery. Although an increase in sedation is observed with the use of gabapentin, patient satisfaction with pain management is higher.

References:
1) Anesth Analg 2011;112:167-73;
2) Anesth Analg 2012;115:1336-42
Introduction: Pain is learned, it not only reflects the presence of noxious stimuli, but is learned from our experiences with the external environment. Pain associated with labour and delivery is the most important anesthetic-related concern for expectant mothers. Acute pain limits the recovery and function of postpartum. Pain may have a significant global and local impact with considerable health, socioeconomic, and quality of life repercussions for those affected. Unfortunately, women generally experience more pain, recurrent pain, severe pain, and longer lasting pain than men. Aggressive management of acute pain may limit the development of chronic pain. Our objective was to examine the preliminary associations between postpartum pain, epidural analgesic use, and psychological indicators of pain.

Methods: This longitudinal study incorporated a convenience sample from patients presenting to the prenatal clinic within a six-month period. The study consisted of a series of questionnaires with three time points. The prenatal consultation was the first time point. Two weeks after delivery was time point 2, and three months after delivery was time-point 3. Our cohort consisted of women who were ASA Physical Status I-II, primiparous, singleton pregnancies, at 30 – 36 weeks gestation. Questionnaires included pain intensity, Pain Catastrophizing Scale (PCS), SF-36, McGill Pain Questionnaire (SF-MPQ), Pain Anxiety Symptoms Scale (PASS), and a questionnaire includes 25-36 items on additional pain related characteristics and demographics.

Results: A total of 320 women were approached at the prenatal clinic and invited to participate. Twenty-one percent declined and 79% consented. Among those who consented, 86% (219/254) completed the first survey during pregnancy (time-point 1), 75% (165/219) completed the time-point 2 survey and 69% (151/219) completed the time-point 3 survey. The mean age of women was 30 ± 5 years. The majority of participants were Canadian, married, and held a post-secondary degree. Preliminary analysis reveals cesarean delivery was performed in 35.4% of participants. Epidural analgesia was chosen by 80% of participants. Numeric rating scale worst and average pain scores in labour were similar in women with epidural analgesia compared to those without. At time-point 2, 73.8% of participants reported having a vaginal tear or perineal injury during delivery. Forty-seven (47.1%) percent of participants were currently taking pain medication for treatment of delivery related pain, this fell to 33.3% at time-point 3. PASS, SF-MPQ, SF-36, PCS data is summarized in table 1. Participants who chose to use epidural analgesia had similar results to those who chose other modalities of analgesia.

Discussion: This study aimed to conduct an assessment of postpartum pain and epidural usage among primiparous women. Our data analysis is ongoing, specifically psychological assessment of women who chose epidural analgesia compared to those who didn’t has not been completed (results will be available for CAS meeting). This project will be the basis for more research to describe the childbirth pain experience and determining the long-term trajectory of the childbirth related pain.

References:
3. Psychological Assessment 1995;7:524-32
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<th>Time-point 1</th>
<th>Time-point 2</th>
<th>Time-point 3</th>
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<tr>
<td>PASS</td>
<td>32.8 ± 15.4</td>
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<td>SF-MPQ</td>
<td>15.4 ± 7.0</td>
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<td>SF-36</td>
<td>76.4 ± 12.6</td>
<td>76.0 ± 12.6</td>
<td>77.0 ± 13.6</td>
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<tr>
<td>PCS</td>
<td>14.4 ± 10.3</td>
<td>-</td>
<td>11.5 ± 10.0</td>
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<tr>
<td>Sexual Function</td>
<td>12.5 ± 1.7</td>
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<td>10.9 ± 2.4</td>
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<td>Sexual Satisfaction</td>
<td>12.3 ± 2.9</td>
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Introduction: The microcirculation is the system used to deliver oxygen and nutrients and eliminate waste such as carbon dioxide of the localized tissues and is represented by the capillaries and the venules. Sidestream Dark Field (SDF) illumination can be used to enable the comprehensive evaluation of the functional state of the microcirculation. The focus of study has been the sublingual vessels primarily because of ease of access. There have been studies of the brain, eye, skin and intestine.[1] The interest of our group lies in the application of the study of microcirculation in pregnant women. We have performed a study assessing the microcirculation of pregnant women and believe the microcirculation of pregnant women to be different than non-pregnant women.[2] Anesthesia used in obstetrics is typically a neuraxial technique. Neuraxial anesthetics have an influence on the sympathetic control of microvasculature, but the impact on microcirculation measures is not yet clear. The vagina represents a theoretical site for evaluation of the microcirculation for pregnant women with neuraxial anesthesia, however, this has never been examined in any population.

Methods: To compare the sublingual microcirculation to the microcirculation of the vaginal mucosa we are studying the feasibility of SDF imaging of the vaginal mucosa and calculation of the microvascular flow index (MFI) in women undergoing a D&C procedure.[3] With REB approval, consent was obtained from women undergoing MAC anesthesia. The study is ongoing, however we must first assess the ability to grade the vaginal microcirculation as is done in sublingual microcirculation. The vaginal microcirculation will be examined with the SDF device applied to the superficial and deep vaginal mucosa followed by sublingual mucosa obtaining steady images of at least 3 seconds duration for both surfaces.

Results: Images of the deep vagina, superficial vagina and sublingual microcirculation are seen in Figure 1 (A - deep vaginal mucosa, B - superficial vaginal mucosa, C - sublingual mucosa). The deep circulation presents as spiral vessels perpendicular to the wall of the vagina, while the superficial vaginal vessels appear similar to sublingual vessels. MicroVision Automated Vascular Analysis (AVA) 3.0 © software analyzes video in two dimensions. Videos containing more than 70% overlap of vessels must be excluded. Looping and overlap of the microcirculation in the deep vagina exclude most of our images. In the more superficial areas of the vagina, blood flow is lateral to the microscopic camera when compared to deep areas and permits application of the software.

Discussion: In our preliminary experience, the assessment of the microcirculation needs to be limited to the more superficial vagina, where the vessels are lateral, not perpendicular to the camera. This allows for better control of the secretions; identifiable access to the area in question; and the ability to utilize the current software available for analysis. All future evaluations of vaginal microcirculation should occur in the superficial vaginal mucosa until suitable means of recording deep vaginal microcirculation are developed.

References: