Abstracts of free papers presented at the annual meeting of the Obstetric Anaesthetists’ Association, London, 12-13 May 2005

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O01 Determination of the dose response relationship of spinal levobupivacaine and bupivacaine, combined with sufentanil, for labour analgesia

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Introduction: Previously, determining the ED50 of levobupivacaine (L) and bupivacaine (B) using MLAC methodology, no difference in potency between L and B was noted, whilst ropivacaine (R) seemed to be less potent then B.1,2 More recent MLAC trials showed that the ED50 of R and L are comparable.3,4 The relative potency of L and R to B is therefore controversial. To resolve this issue, we designed a randomised, blinded trial determining the full dose response relationship of spinal B, L and R, combined with opioids, for labour analgesia. The results for L and B only are reported.

Methodology: Following ethics committee approval and written informed consent, 300 term vertex-presenting women in active labour were included in this blinded, randomised trial. Combined spinal epidural-analgesia was performed and L or B were administered intrathecally in doses of 1.0, 1.5, 2.0, 2.5, 3.0 or 3.5 mg. In every group, local anaesthetics were administered intrathecally in doses of 1.0, 1.5, 2.0, 2.5, 3.0 or 3.5 mg. In every group, local anaesthetics were combined with sufentanil 1.5 μg. Response to spinal analgesia was positive if the visual analogue pain score was <25 mm within 15 min and if analgesia persisted for ≥45 min. Demographics, obstetric data, maternal side effects and fetal and neonatal well-being were noted. Group specific dose response curves were constructed using a probit regression model. ED50 and ED95 doses were calculated. A likelihood-ratio test was used to compare the dose response curves of L and B.

Results: The ED50 values for spinal B and L were 1.671 (95%CI, 1.361-1.912) and 2.320 (95% CI, 1.954-2.717) mg respectively. The ED50 values were 3.337 (95%CI, 2.934-4.081) and 4.961 (95% CI, 4.106-6.985) mg. Spinal L was significantly (P=0.0006) less potent then B, with a potency ratio of 0.67 at the ED95.

Discussion: Based on this study, intrathecal L combined with sufentanil is less potent then B for labour analgesia. Whether L is preferable to B in motor block or other side-effects should be tested using equipotent doses at the upper part of the dose response curve.

References

O02 The effect of oxygen on cardiac function in healthy full-term women

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Introduction: During regional anaesthesia for caesarean section patients are given supplemental oxygen to counteract the cardiorespiratory effects of anaesthesia. Haemodynamic effects in humans receiving normobaric oxygen have been reported.1 The effects of normobaric hyperoxia on the cardiovascular system during pregnancy are unknown. The aim of this study was to investigate the effects of increased FiO2 on cardiac function of healthy full-term parturients.

Method: After approval by local ethics committee and written consent, 15 healthy parturients at 39 weeks’ gestation were recruited into this observational study. Once settled in the supine wedged position, patients were exposed to an increase in FiO2 from 0.21 to 0.4 (8 L O2 via Venturi® Mask) and their cardiac index (CI), heart rate (HR), stroke index (SI), systemic vascular resistance index (SVRI) and mean arterial pressure (MAP) were measured with a non-invasive transthoracic bio-impedance monitor (BioZ System 1.52). Measurements (n=6) were averaged over a 10-min period, at baseline and after equilibration at FiO2 0.4. Data were analysed with Student’s t-test for pairs (SPSS for Windows). P=0.05 was considered significant.

Results: The measured FiO2 increased from 0.19 to 0.33 and SpO2 from 97 to 98% (P<0.0001). There was a mean reduction in CI from 3.18 to 3.03 l.min⁻¹m⁻² (5%, P=0.004). There was a mean increase in SVRI from 2049 to 2178 dyne.s.cm⁻⁵m⁻² (6.5%, P=0.005). The mean reduction in SI from 39.2 to 37.9 mL.m⁻² was not significant (3.4%, P=0.09). There were no significant changes in MAP or HR.

Conclusion: This study demonstrates that even a moderate increase in inspired oxygen fraction has significant effects on the cardiovascular system of the term parturient. The percentage change in CI was similar to that seen in non-pregnant volunteers at a similar inspired FiO2. The reduction in CI in pregnant women appears to be mediated by a reduction in stroke index.

Reference
O03 The effect of maternal position on umbilical Doppler velocimetry in normal term pregnancy

P Tamilselvan, M Shankar, R Fernando, M Columb
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Introduction: Fetal oxygenation depends on placental transfer and therefore on the maternal haemodynamic state. It is well known that to maximise placental blood flow the mother should be allowed to adopt the full lateral position to avoid supine hypotension. Although during caesarean section left lateral table tilt is commonly practised to avoid maternal hypotension and consequent fetal hypoxaemia, the effect of lateral tilt on umbilical blood flow is unknown. Therefore, we used umbilical artery Doppler to measure pulsatility index (PI) ((maximum systolic velocity [S] - minimum diastolic velocity [D])/mean velocity) and resistance index (RI) ((S-D)/S) in different maternal positions to determine the effect of positional change on the umbilical blood flow velocimetry pattern in normal term pregnancy.

Method: After ethics approval and informed consent, we recruited 16 healthy term singleton pregnant volunteers who were asked to adopt four different positions for 5 min in random order; full left lateral (90°LL), full right lateral (90°RL) and supine with either 7.5 (7.5°L) or 15 (15°L) degrees of left table tilt. During this period the following observations were recorded; maternal heart rate (HR), systolic blood pressure (SBP), oxygen saturation (SPO2) and umbilical flow the mother should be allowed to adopt the full lateral position to avoid supine hypotension and consequent fetal hypoxaemia, the effect of lateral tilt on umbilical blood flow is unknown. Therefore, we used umbilical artery Doppler to measure pulsatility index (PI) ((maximum systolic velocity [S] - minimum diastolic velocity [D])/mean velocity) and resistance index (RI) ((S-D)/S) in different maternal positions to determine the effect of positional change on the umbilical blood flow velocimetry pattern in normal term pregnancy.

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Results: Although not statistically significant, lower values of RI and PI were recorded in the 15°L position, indicating higher umbilical blood flows (Table 1). HR and FHR were similar in all positions, whereas SBP was significantly lower in the 90°RL position.

<table>
<thead>
<tr>
<th>Position</th>
<th>SBP*</th>
<th>PI</th>
<th>RI</th>
<th>FHR*</th>
</tr>
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<tbody>
<tr>
<td>90°RL</td>
<td>109.6 (13.9)</td>
<td>0.94 (0.3)</td>
<td>0.56 (0.09)</td>
<td>139.06 (9.3)</td>
</tr>
<tr>
<td>90°LL</td>
<td>117.3 (13.4)</td>
<td>0.88 (0.2)</td>
<td>0.54 (0.09)</td>
<td>138.81 (9.8)</td>
</tr>
<tr>
<td>7.5°L</td>
<td>123.0 (12.4)</td>
<td>0.89 (0.2)</td>
<td>0.51 (0.09)</td>
<td>134.31 (6.9)</td>
</tr>
<tr>
<td>15°L</td>
<td>117.1 (15.8)</td>
<td>0.93 (0.08)</td>
<td>0.51 (8.3)</td>
<td>137.56 (9.3)</td>
</tr>
</tbody>
</table>

Data are mean (SD); *P < 0.05 compared to 90°RL;

Conclusion: Maternal position does not appear to cause significant changes in fetal umbilical artery Doppler indices in normal pregnancy, but further studies are needed to determine the impact on the fetus at high risk for in-utero hypoxaemia.

Reference

O04 Maternal cardiac output changes with phenylephrine and ephedrine infusions after spinal anaesthesia for elective caesarean section

K Ashpole, R Fernando, P Tamilselvan, M Columb
Anaesthetics Dept, Royal Free Hospital, London, UK

Introduction: Maintaining baseline systolic pressure (bSBP) with phenylephrine (P) has been shown to improve maternal and fetal outcome during spinal anaesthesia (SA) for caesarean section (CS).1 We aimed to see if an ephedrine infusion (E) could produce similar results, and to quantify the associated cardiac output (CO) changes using suprasternal Doppler (SupraQ®).

Method: In this randomised double blind study, 40 patients scheduled for CS were allocated either E (N=20, 5 µg/min) or P (N=20, 100 µg/min) infusions, titrated to maintain bSBP. Data collection included HR, SBP, and CO parameters, such as peak velocity (PV) and corrected flow time (FTc), measures of contractility and venous return respectively. These were recorded in the left lateral tilt position, before and after fluid preload, and at 5-min intervals after standard SA. Information on block height, nausea and vomiting (NV), Apgar scores and umbilical cord gases were also recorded. Statistical analysis included RMANOVA, ANCOVA and Tukey-Kramer tests (P <0.05).

Results: Maternal characteristics were similar. SBP equivalency (ratio 1.07, 95%CI 1.00-1.14) was attained in both groups with no significant periods of NV, hypotension (P=0.24) or hypertension (P=0.76) (SBP <80% or >120% bSBP respectively). However, E had a lower umbilical arterial pH compared with P (median (IQR); 7.22 (7.14-7.27) vs 7.33 (7.35-7.31) P=0.0001).

<table>
<thead>
<tr>
<th>Baseline</th>
<th>5 min</th>
<th>10 min</th>
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<th>20 min</th>
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<tr>
<td>CO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>5.56</td>
<td>5.26</td>
<td>4.55</td>
<td>4.67</td>
</tr>
<tr>
<td></td>
<td>(0.67)</td>
<td>(0.93)</td>
<td>(0.70)</td>
<td>(0.72)</td>
</tr>
<tr>
<td>E</td>
<td>5.11</td>
<td>4.93</td>
<td>5.41</td>
<td>5.52</td>
</tr>
<tr>
<td></td>
<td>(0.52)</td>
<td>(1.33)</td>
<td>(1.04)</td>
<td>(0.87)</td>
</tr>
<tr>
<td>HR</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>P</td>
<td>81.70</td>
<td>71.50</td>
<td>68.11</td>
<td>63.55</td>
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<td></td>
<td>(10.41)</td>
<td>(13.79)</td>
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<td>E</td>
<td>74.10</td>
<td>84.05</td>
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<td>(11.28)</td>
<td>(15.95)</td>
<td>(19.54)</td>
<td>(20.96)</td>
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<td>P</td>
<td>103.7</td>
<td>102.1</td>
<td>97.63</td>
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<td>(12.98)</td>
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<td>(15.69)</td>
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<td>361.1</td>
<td>353.5</td>
<td>356.4</td>
</tr>
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<tr>
<td></td>
<td>(36.83)</td>
<td>(47.64)</td>
<td>(30.91)</td>
<td>(37.67)</td>
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Data are mean (SD); *P < 0.05 compared to baseline* (within group), compared to P* (between group)

Conclusion: Despite equivalent SBP control, this was at the expense of greater fetal acidosis with E. CO changes mirrored the HR changes in both groups. The SBP was presumably maintained in P by a vasoconstrictor effect.

Reference
Introduction: Placenta praevia in patients with previous uterine scar is associated with placenta accreta and increased risk of major haemorrhage at delivery. In 2000-02, there were four direct deaths from placenta praevia. Intervventional radiology with trans-catheter arterial embolisation or balloon occlusion is a recognised technique for intractable obstetric haemorrhage. We report our experience in the use of interventional radiology in patients at risk of placenta accreta undergoing caesarean section (CS).

Method: Seven patients with sonographic findings of placenta praevia and suspected accreta or percreta had CS and bilateral internal iliac artery (IIA) catheterization + balloon occlusion or embolisation.

Results: All seven women had general anaesthesia with invasive pressure monitoring. The first woman in the series had CS and caesarean hysterectomy for placenta percreta. She re-bleed and required bilateral IIA embolisation and subsequently ligation with abdominal packing for haemostasis. Her total estimated blood loss (EBL) was 28 L. The other six women in the series had their CS in the radiology department and pre-operative bilateral IIA balloon catheters were sited before CS. Two did not require balloon inflation for haemostasis and their EBL were 1.4 and 2 L. Four had balloon inflation. Of those, one with an EBL of 3 L did not have a hysterectomy, but three required hysterectomy to control bleeding. Two out of the three women who had confirmed placenta accreta. They had CS and caesarean hysterectomy with aid of bilateral IIA balloon occlusion with EBL of 6 and 5.7 L. One hysterectomy was done after the primary operation and removal of IIA catheter for uterine atony. Her total EBL was 9 L. All had live babies and were discharged home well after their operations. The first woman had mild left leg claudication that may be due to her IIA ligation. There were no other complications in this group.

Conclusion: Placing IIA catheters before CS in patients with abnormal placentation is technically easier than at the time of haemorrhage. It may further reduce blood loss and morbidity in these patients. Delayed catheter removal may benefit patients at risk of re-bleeding after CS.

References

Introduction: Haemorrhage remains one of the most common direct causes of maternal mortality.1,2 The aim of this survey was to look at the facilities in obstetric units to manage massive obstetric haemorrhage.

Method: After approval from the Obstetric Anaesthetists’ Association we posted a survey to all lead obstetric anaesthetists in the UK. There were 14 questions requiring yes or no answers assessing unit practices and facilities for the management of massive haemorrhage.

Results: 182 out of 243 were returned giving a 75% response rate.
- 94.5% of units had haemorrhage guidelines
- 40% had haemorrhage drills to practise guidelines
- 86% of units had a blood bank on site
- 93% included O negative blood in their guidelines
- 86% could get their O negative blood in 2-3 minutes
- 64% had a haemorrhage trolley with the necessary equipment
- 38.5% owned a rapid transfuser/warmer
- 11% had used a cell saver in obstetrics
- Only 1 unit owned a cell saver
- 42% shared a cell saver and 13% planned to buy one.
- When asked about management of a caesarean section patient at known high risk of haemorrhage, 77.5% of units would have a consultant obstetrician present and 86% consultant anaesthetist
- 21.5% of such cases would receive a general anaesthetic.
- A high dependency unit (HDU) was only available within 50% of obstetric units
- 70% of units said they could manage invasive monitoring. Many units added that their obstetric patients would have to go to the main HDU in the hospital to manage invasive monitoring.

Discussion: The recently published Confidential Enquiry into Maternal and Child health recommends that all units should have a massive haemorrhage protocol and regular drills for all grades of staff. Our survey demonstrates that compliance with the latter needs improvement (40%). It also recommends that women at high risk of haemorrhage should have consultants in attendance and be delivered in centres able to provide immediate access into blood products, intensive care and other interventions. Our survey found that high dependency care is available in only 50% of obstetric units that responded.

References
3. Why Mothers Die. 2000-02

O05 Perioperative bilateral internal iliac artery balloon occlusion in patients with placenta praevia undergoing caesarean section
M Mok, B Heidemann, V Clark
Royal Infirmary of Edinburgh, UK

O06 Massive obstetric haemorrhage: a survey of obstetric units in the UK
J McCheyne, Z Arfeen, P Evans, U Misra
SpR Northern Rotation, Consultant Anaesthetists, Sunderland Royal Infirmary, Sunderland, UK
O07 Survey of anaesthesia for caesarean section in preeclampsias and eclamptics in the UK
M Kitching, F Phat
Department of Anaesthesia, Queen Charlotte’s Hospital, London, UK

Introduction: Although most units now have a protocol for the care of preeclampsia/eclampsia, anaesthetic management is still controversial.¹ This survey was conducted to establish actual anaesthetic practice for caesarean section in these patients.

Method: A postal survey, approved by the OAA, was sent to all consultant anaesthetist members of the OAA working in the UK. Scenarios involving eclamptics and preeclampsias were described, including (obstetric) need for urgent delivery, uncontrolled hypertension, abnormal clotting, pulmonary oedema, and post-ictal patients. Details of anaesthetic technique, including invasive monitoring used, vasoconstrictors and type of fluid regime employed were requested.

Results: 711 completed surveys were received, from 936 consultants surveyed, (response rate of 76%). In a stable preeclamptic the most popular technique for caesarean section was single shot spinal (SSS) (77%), although 18% would use a CSE. In uncontrolled hypertension this fell to 61% SSS, 21% CSE, with 15% opting for GA. If platelets <80 x 10⁹/L, 76% used GA and only 21% SSS. At a higher count (80-100), 73% used SSS and only 10% GA. In a patient with pulmonary oedema, 79% opted for GA; 94% would do so in an uncooperative post-ictal patient. Only 16% would reduce their usual dose of LA in these patients, commonly when CSE was used. 86% would not change their vasoconstrictor, although 41% would modify the dose; ephedrine was most popular. In preeclampsia and eclamptics 64% and 76% respectively, would reduce their vasoconstrictor, although 41% would modify the dose; ephedrine was most popular. In preeclampsia and eclamptics 64% and 76% respectively, would reduce their usual dose of LA in these patients, commonly when CSE was used. 86% would not change their vasoconstrictor, although 41% would modify the dose; ephedrine was most popular. In preeclampsia and eclamptics 64% and 76% respectively, would reduce their usual dose of LA in these patients, commonly when CSE was used.

Conclusion: Despite concerns about haemodynamic stability expressed in the textbooks, the majority of consultant anaesthetists currently do use SSS anaesthesia for both eclamptic and preeclamptic patients, and do so without greatly modifying their usual technique, using GA only in unstable patients or where obstetric reasons required urgent delivery.

References

O08 The effect of serial in-vitro haemodilution with maternal CSF on TEG blood coagulation parameters: implications for epidural blood patch
P Tamilselvan, R Fernando, J Dick, M Columb
Anaesthesia Department, Royal Free Hospital, London, UK

Introduction: Post dural puncture headache [PDPH] is not uncommon after spinal anaesthesia, with epidural blood patch [EBP] being the most effective treatment. Controversy exists regarding EBP including uncertainty about the volume of blood needed for effective treatment, with considerable variation in the amounts of blood (10-20 mL) used. An in-vitro study with thromboelastography [TEG] has shown the procoagulant action of CSF on blood 20% haemodiluted with CSF.¹ The aim was to quantify the effect of a range of CSF dilutions on TEG values.

Method: After ethics committee approval and informed consent, 1 mL of CSF was obtained from 34 pregnant patients undergoing spinal anaesthesia for elective caesarean section. After intravenous cannulation, 10 mL of blood was collected and anticoagulated with buffered citrate. CSF samples then underwent serial haemodilution with whole blood calculated to produce final CSF concentrations of 10%, 20% and 30%. Similar dilutions with Ringer’s lactate (RL) acted as controls. Blood samples were recalified by mixing 0.33 mL blood with 0.03 mL 0.2M CaCl₂ within a TEG cup warmed to 37°C. Using the TEG 5000, r and k times, alpha angle (α) and maximum amplitude (MA) were measured. Analysis of data included Friedman and RMANOVA (P<0.05).

Results: Progressive haemodilution with CSF significantly reduced r and k times and increased α angle compared with RL (Table). MA was significantly reduced by both diluents.

<table>
<thead>
<tr>
<th></th>
<th>r time (min)</th>
<th>K time (min)</th>
<th>α angle (°)</th>
<th>MA (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSF10</td>
<td>7.6(1.8)*</td>
<td>1.5(0.4) *</td>
<td>67.3(5.8) *</td>
<td>67.4(5.8) *</td>
</tr>
<tr>
<td>RL10</td>
<td>9.3(2.6)</td>
<td>2.0(0.7)</td>
<td>61.7(8.7)</td>
<td>68.6(4.7)</td>
</tr>
<tr>
<td>CSF20</td>
<td>6.4(1.7)*</td>
<td>1.4(0.4)*</td>
<td>68.7(6.4)</td>
<td>63.8(6.6)</td>
</tr>
<tr>
<td>RL20</td>
<td>8.5(2.5)</td>
<td>2.1(1.0)</td>
<td>61.0(8.4)</td>
<td>64.6(5.0)</td>
</tr>
<tr>
<td>CSF30</td>
<td>5.7(1.5)*</td>
<td>1.3(0.3) *</td>
<td>69.5(6.2)</td>
<td>60.2(6.9)</td>
</tr>
<tr>
<td>RL30</td>
<td>8.9(4.3)</td>
<td>2.0(0.8)</td>
<td>61.2(7.9)</td>
<td>64.0(5.3)</td>
</tr>
</tbody>
</table>

Data are mean (SD); *P < 0.05 compared to RL.

Conclusion: Addition of increasing amounts of CSF speeds up both clotting activation and clot formation (r, K & α angle), but decreases clot strength (MA). This may have implications for EBP, in terms of a reduced success rate, if attempted when CSF leak following dural puncture is thought to be maximal.

References
O09 Reports on Confidential Enquiries into Maternal Deaths: a secondary analysis of cardiac deaths
S. Malhotra, S.M. Yentis
Chelsea and Westminster Hospital, London, UK

Introduction: Cardiac disease is a consistent major cause of maternal death, and in the latest Report on Confidential Enquiries into Maternal Deaths (CEMD) it was the 2nd most common cause. The CEMD reports stress the importance of anticipating adverse outcomes in individual cases, but development of strategies for managing such cases requires an overview of trends in the patterns of disease – i.e. whether the conditions are known or unknown – as well as the actual diagnoses. We analysed these trends over the last 30 years.

Methods: We classified all CEMD cardiac deaths (1973 to 2002) according to whether the condition was pre-existing (known/unknown) or acquired during pregnancy.

Results: 288 deaths were counted. Trends in the patterns of cardiac disease are shown in the Figure.

Conclusions: There is clearly a continuing need to counsel, refer and appropriately manage women with known pre-existing cardiac disease. However, our results suggest an increasing need to screen women before pregnancy or on booking since the number of deaths in mothers with undiagnosed cardiac disease is rising. Similarly, more attention is required to cardiac disease developing during pregnancy, since early screening and referral strategies alone will not prevent units from having to deal with such cases. All units therefore require processes for monitoring and managing women for the development of cardiac disease throughout their pregnancies. The absolute number of births in the UK is similar now to that in the early 1970s, indicating that the increase in deaths cannot be explained by increasing birth rates.

Reference

O10 How obstetric anaesthetists test the quality of regional anaesthetic block before caesarean section: a national survey
M. Sodhi, P. Tamilselvan, R. Fernando, S. Venkatesh
Anaesthesia Dept, Royal Free Hospital, London, UK

Introduction: Assessment of sensory block after regional anaesthesia for caesarean section (CS) is vital in ensuring reliable and effective anaesthesia before surgery. The aim of this national survey was to find out how obstetric anaesthetists tested the adequacy of regional block as well as to ascertain the amount of associated documentation and postpartum follow-up.

Method: 1035 UK consultant OAA members were sent a questionnaire relating to regional anaesthesia for caesarean section. Information collected included the modality/method used to check the block, acceptable upper/lower block levels, intraoperative notes documentation, preoperative discussion of risks and the frequency of postpartum follow-up.

Results: 747 (72%) members responded; 668 members (90%) used temperature (cold) to check the level of the block, either alone (45%) or in conjunction with touch and pinprick. The commonest upper target level was T4 using either cold (67%), touch (37%) or pinprick (49%). The lower level of block was checked by 52% of whom 65% aimed for S 234. 91% members routinely warn patients preoperatively of pain/discomfort during CS and 85% warn of potential conversion to GA; 88% performed routine postpartum follow-up.

Conclusion: Although a touch block to T5 before surgery may reduce the incidence of intraoperative discomfort, most anaesthetists used cold, with only 50% checking touch. Anaesthetic notes documentation varied from 37-89% depending on the modality checked and remains an area for improvement. Most anaesthetists routinely warn patients of pain/discomfort and also follow them up in the postpartum period.

Reference
O11 Why women with ‘mobile’ epidurals aren’t mobile
J.C. Glynn, SM Yentis
Chelsea & Westminster Hospital, London, UK

Introduction: Low dose epidural analgesia is routinely used in labour, one advantage being the sparing of motor function. In theory, this should allow women used in labour, one advantage being the sparing of motor block. However, we noticed that many women receiving an epidural in our hospital do not even get out of bed. We investigated how many women mobilised with their ‘mobile’ epidural, and their reasons for not doing so.

Methods: Local Research Ethics Committee approval was obtained before presenting the results of this local audit. One hundred women who had received low-dose (0.1% bupivacaine 10-15 mL with fentanyl 2 µg/mL) epidural analgesia during labour were followed up 12-24 h after delivery. They were asked if they had mobilised after receiving their epidural, and if they were satisfied with the level of mobilisation achieved. They were also asked which factors prevented them from mobilising as much as they would have liked.

Results: 96 women had epidurals and four had CSEs. Mean (SD) total dose of bupivacaine was 60.9 (41.8) mg. The mean (SD) number of top ups was 3.16 (2.27). Reasons for not mobilising are shown below.

Table. Reasons given by mothers for not mobilising more than they did, or not mobilising at all (n (%)).

<table>
<thead>
<tr>
<th>Reason</th>
<th>Mobilised at all</th>
<th>Yes (n = 53)</th>
<th>No (n = 47)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor block</td>
<td>13 (24.5%)</td>
<td>13 (27.7%)</td>
<td></td>
</tr>
<tr>
<td>Attached to CTG</td>
<td>12 (22.6%)</td>
<td>14 (29.8%)</td>
<td></td>
</tr>
<tr>
<td>Attached to i.v. infusion</td>
<td>11 (20.8%)</td>
<td>13 (27.7%)</td>
<td></td>
</tr>
<tr>
<td>Discouraged</td>
<td>6 (11.3%)</td>
<td>8 (17.0%)</td>
<td></td>
</tr>
<tr>
<td>Too tired</td>
<td>2 (3.7%)</td>
<td>7 (14.9%)</td>
<td></td>
</tr>
<tr>
<td>Delivered within 30 min</td>
<td>0 (0%)</td>
<td>7 (14.9%)</td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td>2 (3.7%)</td>
<td>1 (2.1%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>1 (1.9%)</td>
<td>2 (4.3%)</td>
<td></td>
</tr>
<tr>
<td>Satisfied with level of mobility achieved</td>
<td>24 (45.3%)</td>
<td>9 (19.1%)</td>
<td></td>
</tr>
</tbody>
</table>

Discussion: Many women with low-dose epidurals do not get up at all, mainly due to attachment to infusions or monitors, or motor block. While there is no evidence that mobilising improves mode of delivery or shortens labour, we found that overall 77% of mothers were dissatisfied with the level of mobility achieved.

References

O12 Injectate temperature and discomfort during epidural injection
DY Shetty, JP Stone, JG Jenkins
Dept. of Anaesthesia, Royal Surrey County Hospital, Guildford, UK

Introduction: Since 1995 nearly all obstetric epidurals at this hospital have used 20-mL premixed syringes of bupivacaine 0.1% with fentanyl 0.0002%, stored in a refrigerator. One of the authors thought that more patients complained of pain on initial injection of this cold solution than when he had used similar solutions elsewhere stored at room temperature. We present data from a prospective randomised double-blind study.

Method: With ethics committee approval, parturients requesting epidural analgesia in labour were randomly allocated to receive an initial 20-mL epidural dose of bupivacaine 0.1% with fentanyl 0.0002% (B + F), given as two 10-mL doses with a 5-min interval, at either room temperature or cold from a refrigerator. Following the epidural injection patients were asked by a blinded observer to score any pain during the injection on a 10-cm linear analogue scale (VAS). It was planned to recruit 48 patients in each group, giving a 90% chance of detecting a significant difference at the 5% level if using room temperature injectate reduced the incidence of discomfort from 40% to 10%. Results were subjected to simple descriptive and non-parametric (χ²) statistical analysis.

Results: Forty nine parturients received B + F at room temperature and 47 received it cold from a refrigerator. The mean VAS score in the room temperature group was 1 mm (range 0-28 mm SD 5 mm) and in the cold group was 4 mm (range 0-22 mm SD 6 mm). In the room temperature group 8% of patients had a VAS score greater than 6 mm, compared to 23% in the cold group (χ²=4.22, P<0.05, difference 15% with 95%CI 1 to 30%). In the room temperature group 84% of patients had a VAS score of zero, compared to 47% in the cold group (χ²=14.1, P<0.01, difference 37% with 95%CI 18 to 52%).

Conclusion: To prevent precipitation, bupivacaine is supplied at a low pH as a hydrochloride. The dissociation constant (Ka) of a local anaesthetic increases (pKa decreases) as temperature rises. Higher temperatures favour neutral species and will tend to raise pH. As low pH may in itself be a pain-inducing stimulus, this increase in Ka and hence higher pH may explain our findings.

References
O13 A comparison of epidural volume expansion in combined spinal epidural (CSE) anaesthesia against control groups for elective caesarean section

P O’Brien, A Addei, N Walton, S Philip, S Hallworth
Dept of Anaesthesia, The Royal London Hospital, London, UK

Introduction: Epidural volume expansion (EVE) as part of a CSE technique for caesarean section is popular in some obstetric units. It has been shown that intrathecal local anaesthetic spreads more rostrally following EVE than in a control group. This randomised double blind study aimed to test this hypothesis.

Methods: Following ethics committee approval, 86 patients were randomised into one of three groups. Following routine monitoring and crystalloid preload, all patients received a CSE in the sitting position. Group 1 received hyperbaric bupivacaine 7.5 mg with no EVE. Group 2 received hyperbaric bupivacaine 7.5 mg followed immediately by 5-mL saline EVE via the Tuohy needle. Group 3 received hyperbaric bupivacaine 10 mg and no EVE. All patients had fentanyl 15 μg in the local anaesthetic mixture. Data collection included patient characteristics, maximal sensory level and motor block assessed at 5-min intervals and episodes of hypotension and ephedrine use. A successful block was defined as a sensory level at T4 or above (to ethyl chloride) at 15 min. If the block height was deemed to be inadequate, the epidural catheter was topped up with 5-mL incremental doses of 0.5% plain bupivacaine until an analgesic level to T4 was obtained. Statistical analysis included Kruskal Wallis and χ^2 tests.

Results: There was no significant difference in patient characteristics, maximal sensory level, motor block, the incidence of hypotension or ephedrine requirements between the groups. Median block height in all three groups was T3. Failure occurred in 30% of those receiving bupivacaine 7.5 mg regardless of EVE (P=0.950). Of those receiving bupivacaine 10 mg, 6% failed to achieve an adequate level of block, which was statistically significant when compared to both the other two groups (P<0.05). Only one patient (group 1) required a general anaesthetic for intraoperative pain.

Conclusion: Our study has failed to show any benefit in using EVE following a CSE technique, with low dose intrathecal bupivacaine having a high initial failure rate, although subsequent epidural top-up was successful in all but one patient. Despite a higher failure rate, low dose bupivacaine was not associated with a reduction in the incidence of hypotension.

Reference

O14 UK survey of obstetric regional blocks for women with multiple sclerosis

E Drake, M Drake, R Russell
Nuffield Department of Anaesthetics, John Radcliffe Hospital, Oxford, UK

Introduction: There has been a reluctance to use regional blocks in women with multiple sclerosis (MS) as the effects of regional anaesthesia on the course of the disease are unclear. Published literature is limited to either small unrandomised series or case reports.1,2

Methods: Following the OAA’s seal of approval, a postal questionnaire was sent to all UK consultant members. The survey aimed to assess views on antenatal assessment, labour analgesia, anaesthesia for elective and emergency caesarean section, and any modification in technique when managing a woman with MS. Enquiries were also made into postnatal problems ascribed to regional blocks.

Results: Of 1028 questionnaires sent, 619 (60%) replies suitable for analysis were received. Most responders (91%) had seen fewer than 10 cases in the past 10 years. The majority (97%) tried to assess those with MS antenatally. Postnatal relapse was most commonly discussed. Relapse rates were perceived to be increased by 12% of responders after epidurals and 13% after spinals. For labour analgesia in MS, 99% would use a regional block (epi 94% CSE 5%). However, many stated they would only perform a block after discussion regarding relapse, and would use the lowest LA dose possible to maintain analgesia. For elective caesarean section in a healthy woman, regional anaesthesia was preferred by over 99% (spinal 82.4%, CSE 15.7%, epi 1.7%). In women with MS, 28% would modify their practice with need for consent and minimising LA dose again highlighted. A preference for epidural rather than spinal was stated by 4%; 2% would not use a regional block. For emergency caesarean section with inadequate time for epidural anaesthesia, 3% would perform a general anaesthetic. The remainder would consider performing a regional block. Non-specific deterioration of symptoms after delivery were reported by 25%, with 2% attributing symptoms such as prolonged block, leg weakness, bladder dysfunction and postnatal relapse to the use of regional blocks.

Discussion: The majority of UK anaesthetists would perform regional blocks for labour and caesarean section in women suffering from MS. Many emphasised the need for thorough pre-assessment and informed consent. The latter remains difficult, as current evidence is inconclusive.

References
O15 A retrospective audit of combined spinal-epidural blockade for endoscopic fetoscopy
J Allam, G Stocks, F Plaat, C R Bedson
Queen Charlotte’s & Chelsea Hospital, Du Cane Road, London, UK

Introduction: Fetoscopy involves the insertion of ports through the abdominal wall and into the uterus allowing procedures such as bipolar umbilical cord occlusion or placental laser ablation to be performed. Most centres use local infiltration with intravenous sedation. In our unit, due to increasing complexity and duration of procedures undertaken, we have begun to provide neuraxial blockade using CSE. As the density of block required has not been described, we audited our first series of cases to examine the efficacy of analgesic versus anaesthetic dosages in terms of patient comfort and cardiovascular stability.

Method: The following data were extracted from the charts of women who had undergone fetoscopy during a two-year period: indication for fetoscopy, intrathecal and epidural drugs and dosages used, block height attained (to cold), total ephedrine used, duration of procedure and evidence of intra-operative pain. Patients receiving 6 mg or less of intrathecal bupivacaine and 0.25% or weaker bupivacaine solutions for epidural top-ups were designated the ‘analgesic’ group. The remainder formed the ‘anaesthetic’ group. The block was defined as inadequate if pain requiring an epidural top-up of a greater concentration than 0.25% bupivacaine was given.

Results: 19 patients were identified; 11 had undergone placental laser ablation and 8 bipolar cord occlusion. There were three inadequate blocks in the low-dose ‘analgesic’ group compared with none in the ‘anaesthetic’ group. Women in the latter received significantly more intrathecal bupivacaine, but needed significantly more ephedrine.

<table>
<thead>
<tr>
<th></th>
<th>Analgesic (N=14)</th>
<th>Anaesthetic (N=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestation (wk)</td>
<td>21.9 (3.6)</td>
<td>22.2 (3.4)</td>
</tr>
<tr>
<td>Bupivacaine (mg)</td>
<td>4.3 (1.0)</td>
<td>10.7 (1.1)</td>
</tr>
<tr>
<td>Fentanyl (µg)</td>
<td>21.8 (3.2)</td>
<td>12.0 (11.5)</td>
</tr>
<tr>
<td>Block height</td>
<td>T6 [T8-T4]</td>
<td>T4 [T5-T3]</td>
</tr>
<tr>
<td>Ephedrine (mg)</td>
<td>3.7 (7.1)</td>
<td>31.8 (28.0)</td>
</tr>
<tr>
<td>Duration (min)</td>
<td>95 (30)</td>
<td>94 (34)</td>
</tr>
<tr>
<td>Failed block</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

Results are expressed as mean (SD), median [interquartile range] and count as appropriate. *P=0.001 *P=0.033

Conclusion: Our audit suggests that using a CSE technique with doses similar to those used for labour analgesia, will result in a 21% failure rate for fetoscopic procedures. Although dosages closer to those used for caesarean section ensured patient comfort, it is unknown if the increased need for ephedrine to maintain cardiovascular stability represents an added threat to an extremely immature already at risk fetal population.

O16 National survey of obstetric anaesthetic handovers
N Sabir, SM Yentis, A Holdcroft*
Department of Anaesthesia, Chelsea and Westminster Hospital & *Imperial College, London. UK

Introduction: Handovers are essential for continuity of patients’ care and recent guidance from the Department of Health1 and Association of Anaesthetists2 emphasises their importance. A recent UK survey found that few anaesthetic departments had structured handover procedures although most felt they were needed.3 Since obstetric anaesthesia was excluded from this survey, we conducted a survey of obstetric anaesthesia handovers.

Methods: After approval by the OAA Audit Subcommittee, we sent a questionnaire to the lead obstetric anaesthetist in all 261 maternity units in the UK, asking about usual handover practice in their unit and their opinion about the need for formal handovers.

Results: The 161 responses (61%) received so far are shown in the Table.

Table Obstetric anaesthetic handover practice (n=161)

| Specific unit policy for handover | 16 (10%) |
| Allocated time for handover | 124 (77%) |
| Time usually spent on h/over: | |
| < 15 min | 108 (67%) |
| 15-30 min | 32 (20%) |
| > 30 min | 1 (0%) |
| Separate theatre team for elective cases | 69 (43%) |
| Elective cases never delayed for handover | 111 (69%) |
| Handover prevented by work pressure: | |
| Never | 68 (42%) |
| < 1/week | 66 (41%) |
| 1-3/week | 13 (8%) |
| > 3/week | 2 (1%) |
| Routine documentation of handover | 10 (6%) |
| Known critical incidents relating to h/over | 7 (4%) |
| Need for formal documented h/over: | |
| Strongly agree / Agree | 45 (28%) |
| Neutral | 52 (32%) |
| Disagree / Strongly disagree | 60 (37%) |

Discussion: As in non-obstetric practice, despite strong recommendations1,2 few units have specific handover policies and there is little documentation, though most have allocated time and interruption by pressure of non-elective work is uncommon. In contrast to non-obstetric anaesthetists most respondents disagreed that handover should be a standardised documented process. These discrepancies merit further investigation, especially in the light of the critical incidents reported above.

References
O17 Where is T5? A survey of anaesthetists
K Congreve, M Scrutton, C Laxton,* I Gardner
St Michael’s Hospital & *Southmead Hospital, Bristol, UK

Introduction: Pain felt during caesarean section (CS) under regional anaesthesia is the most common cause of successful litigation against anaesthetists in the UK. Where possible the level of the block must be tested and documented before surgery starts. Traditionally cold or pinprick was the testing modality and T4 the appropriate target level. This has been challenged such that touch is increasingly regarded as the most predictive modality and T5 the appropriate target level.  

Methods: 73 anaesthetists from the Bristol Hospitals were asked to mark a point on an anatomical picture (Figure) where they would test T5 on the left side. Standard dermatomal levels were superimposed and compared to the points marked.

Results: The figure shows the scatter of points with T5 dermatomal level superimposed; 46 (63%) of points lay in the T5 dermatome; 6 (10%) points were below T5 (4 in T6, 2 in T7); 12 (16%) of points were two or more dermatomes away from T5.

Discussion: Our survey demonstrates that misjudgement may occur when testing the level of block. This may be exaggerated when the T5 level is chosen as there are no specific landmarks (cf T4 nipple, T6 xiphisternum).

Conclusion: If a block to T5 to touch is required in order to minimise the incidence of intraoperative pain at CS, anaesthetists need to know where the T5 dermatome lies. However, despite achieving this level, consent should always include the possibility of failure.

References

O18 Is my T2 your T2 too?
SM Yentis
Chelsea & Westminster Hospital, London, UK

Introduction: One must always test and record the level of regional anaesthesia for caesarean section (CS), but attention has focussed on the modality of sensation tested, ignoring the consistency of recording between anaesthetists. The aim of this study was to compare the levels of block determined by an experienced consultant obstetric anaesthetist and anaesthetic SpRs.

Methods: After ethical approval and informed consent, women receiving spinal or CSE anaesthesia for elective CS involving the same consultant anaesthetist, but a different SpR each time, were included in the study. The SpR was asked to test and record the level of block to touch and cold; the consultant immediately repeated the testing, the SpR again recording the levels obtained. The consultant only spoke to the patient during testing, so as not to influence the SpRs’ recording.

Results: 10 patients and 10 SpRs were studied. SpR levels were lower by a median of 3-4 segments (Figure).

Figure: Levels of block to touch and cold recorded by SpRs and a consultant anaesthetist (right ---; left - - -).

Discussion: Observation of colleagues over many years suggests that most record the level of block as that at which the patient says she feels touch/cold, and leave it at that – as reflected in the SpRs’ lower recorded levels. However, it is more logical to continue to test above this level until the patient no longer feels a difference, for although she may say she feels touch/cold at the lower level, there is still a degree of block there and the true level of block is higher (e.g., when tasting water for saltiness one would call a sample salty when one tasted salt, not when one tasted a bit less salt than in the previous sample). Although this could be considered merely a matter of semantics, it may have great clinical or medicolegal relevance: one person’s T2, for example, may not equate to another’s, making it difficult to interpret both published recommendations for minimal levels of block for CS, and medical records after a complaint. Obstetric anaesthetists need to be more logical and consistent in recording the level of block when testing the adequacy of regional anaesthesia.
O19 Maternal haemodynamic effects following combined spinal epidural (CSE) anaesthesia for Caesarean section: dose response effects of hyperbaric bupivacaine

M Van de Velde, D Van Schoubroek *, J Jani *, E Vandermeersch, A Teunkens
Departments of Anesthesiology and * Obstetrics and Gynecology, UZ Gasthuisberg, Leuven, Belgium

Introduction: Theoretically, an advantage of low dose spinal anaesthesia for caesarean section is the reduced incidence of hypotension. The data to support these considerations is limited.1,2 Thus a randomised, blinded trial was initiated to evaluate the haemodynamic effects of a high and low dose of hyperbaric spinal bupivacaine as part of a CSE technique, was initiated.

Methodology: Following ethics committee approval and informed consent, 50 ASA II/II women carrying term pregnancies scheduled for elective C-section, were randomised to two groups. All patients underwent CSE anaesthesia whilst seated. The intrathecal mixture consisted of sufentanil 2.5 μg combined with hyperbaric bupivacaine either 6.5 (L-group) or 9.5 (H-group) mg. Demographic data, obstetric data, visual analogue scale (VAS) score for pain, number of anaesthetist interventions for pain, haemodynamics and neonatal outcome were recorded. Data were analysed using analysis of variance and appropriate parametric and non-parametric tests.

Results: No differences in demographic and obstetric data were observed. Neonatal outcome was good in all groups. Hypotension was more pronounced in the H-group compared to the L-group (95 ± 25 vs 68 ± 18 respectively, P<0.05).

Duration hypotension (') 15.8 ± 9.2 4.5 ± 4.4*

SAP decrease >20% (n) 17 4*

SAP decrease >10% (n) 20 14*

Max decrease MAP (%) 36 ± 15 20 ± 12*

Max decrease SAP (%) 33 ± 14 15 ± 14*

Lowest SAP (mmHg) 88 ± 16 102 ± 16*

H-group (n=25) L-group (n=25)

P <0.05 vs H-group, SAP: systolic blood pressure

Discussion: From these results we conclude that reducing the spinal dose of hyperbaric bupivacaine as part of CSEA anaesthesia, improves maternal haemodynamic stability. Hypotension is less severe, requires less treatment and is much shorter in duration. However, duration of anaesthesia is limited.

References

O20 Survey of obstetric anaesthesia training in the UK

N Lewis, F Plaat
Department of Anaesthesia, Queen Charlotte’s Hospital, London, UK

Introduction: There is concern that changing patterns of training and work have reduced trainees’ skills in airway management in obstetric patients.1,2 In 2003, before the deadline for starting the ‘New Deal,’ a survey was sent to trainee anaesthetists to determine their experience in emergency and obstetric general anaesthesia.

Method: A postal survey, approved by the OAA, was sent to all OAA members registered as trainees. They were asked how much obstetric anaesthetic training they had done, how many obstetric and non-obstetric rapid sequence inductions (RSI) they had performed, and how they had managed cases of difficult/failed intubation.

Results: 173 of the 390 surveys were completed, giving a response rate of 44%. Of these, 168 reported SHO experience, 166 year 1/2 SpR and 135 year 3/4/5 SpR. The median duration of sub-speciality training for SHOs, year 1/2 SpRs and year 3/4/5 SpRs was 7, 9 and 6 months respectively. Table 1 shows the median number of RSIs performed at each stage of training.

Table 1. Cases of rapid sequence induction performed

<table>
<thead>
<tr>
<th>Stage of training</th>
<th>Non-obstetric cases</th>
<th>Obstetric cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHO</td>
<td>128 (75-232)</td>
<td>14 (6-30)</td>
</tr>
<tr>
<td>SpR 1/2</td>
<td>90 (50-171)</td>
<td>15 (8-29)</td>
</tr>
<tr>
<td>SpR 3/4/5</td>
<td>79 (39-155)</td>
<td>10 (5-21)</td>
</tr>
</tbody>
</table>

Of the 137 reports of difficult intubations, the gum-elastic bougie and McCoy laryngoscope were the most popular items of equipment (93 and 46% cases respectively). Of the 42 cases of failure to intubate, the anaesthetist continued with general anaesthesia in 25 cases (60%). The patient was subsequently intubated by another anaesthetist in 11 (44%) of these cases. In the remainder the airway was maintained with an LMA in 12 cases (48%) and with a facemask and oropharyngeal airway in 2 (8%).

Conclusion: These results suggest that, as expected, most experience of emergency general anaesthesia is acquired outside of obstetrics, but trainees are still performing RSI on a number of obstetric patients. The LMA has taken over from the facemask as the most popular method for airway maintenance when general anaesthesia is continued after a failed intubation.

References
O21 Prospective study of incidence, management and outcome of 28 consecutive cases of suspected placenta accreta

C Weiniger,¹ T Elram,² D Mankuta,² C Weissman,¹ Y Ezra²
¹Department of Anaesthesia and Critical Care Medicine; ²Department of Obstetrics & Gynaecology, the Hadassah Hebrew University Medical Centre, Jerusalem, Israel

Background: Placenta accreta is the major cause of caesarean hysterectomy.¹ The diagnosis is only confirmed at surgery. The aim of the study was to assess whether all patients in whom placenta accreta was suspected need preparation for massive blood loss.

Methods: A two-year prospective observational study, performed with IRB approval. A multidisciplinary protocol was implemented when accreta was clinically suspected: placenta praevia with uterine scar; ultrasound suspicion of placenta accreta, accompanied by placenta praevia and/or previous caesarean section. Patients were classified as either high or low suspicion for placenta accreta. Data for perioperative and postoperative course were recorded.

Statistical analysis: Data were analysed using SPSS 9.0 (SPSS Inc. Chicago, Illinois). A two-sample t-test was used for parametric variables and the Mann-Whitney test for non-parametric variables. χ² was used for non-parametric discrete variables. P <0.05 was considered significant.

Results: Twenty eight cases of suspected placenta accreta were prospectively identified: 17 high suspicion, and 11 low suspicion. Overall incidence of actual placenta accreta was 50% (14/28 suspected cases). High risk women had more previous caesarean sections (2.2±1.6 vs. 1.0±0.9, P=0.035). General anaesthesia was provided for all high suspicion patients and regional anaesthesia (using a combined spinal-epidural technique) for 4/11 low suspicion cases (P=0.007). Twelve patients underwent unplanned hysterectomies, and all were high suspicion for placenta accreta (P<0.001). Caesarean hysterectomy significantly prolonged surgery (152.8±59.8 min versus 77.5±41.6 min, P=0.002). High suspicion patients required more blood transfusions (6.5± 7.0 units versus 1.09± 1.1units, P=0.017). Postoperatively, 10/12 patients who underwent hysterectomy were admitted to the ICU. Overall, postoperative complications were seen in 65% of the high suspicion women. There were no deaths.

Conclusions: Suspected placenta accreta can be graded preoperatively as high or low suspicion prior to surgery. High suspicion cases require anaesthesia management appropriate for massive haemorrhage and unplanned caesarean hysterectomy.

Reference
P01 Hypnosis for childbirth: a patient satisfaction questionnaire
J Mörch-Siddall, E Hawney
Department of Anaesthesia, Royal Victoria Infirmary Newcastle upon Tyne, UK

Introduction: Amongst pregnant women there is a demand for hypnosis for childbirth. Hypnotherapists are often unqualified and unregulated, books available to women and the therapy delivered may not reflect the reality of giving birth. A recent review supported the use of hypnosis for labour but highlighted no common method of delivery. We have designed an antenatal hypnotherapy course, delivered by a consultant anaesthetist qualified in medical hypnotherapy, to reflect the experiences of women giving birth in our unit. We present the results of a satisfaction questionnaire.

Method: A hypnotherapy course for labour was written, and given in four one-hour sessions, weekly, from 32 weeks, in groups of three to five and self referred. Twelve post-natal questionnaires were sent by email. The women were asked how they found the sessions, whether they were useful, whether they used the hypnosis in labour, whether they used hypnosis postnatally and for general comments.

Results: Ten questionnaires were returned fully completed (>70% response rate). Four women had normal deliveries, two had elective caesarean sections, three had vacuum extraction and one had a class III caesarean section. All found the sessions relaxing and enjoyable and the self-hypnosis easy to learn. Six women felt it improved their sleep, both ante and postnatal. Two women found it relieved backache. All found it useful in the initial phase of labour, three felt it enabled them to stay at home longer presenting at >6 cm. One woman (induction) said ‘it stopped me crawling the walls before my epidural.’ All expressed ‘being more in control’ during delivery.

Conclusion: Women can leave hospital with feelings of inadequacy if labour has not been ‘normal,’ hypnosis can improve satisfaction by allowing favourable re-interpretation of the birth. It wrests the locus of control back with them. It is self administered, cheap, has no side effects and could be the ideal anaesthetic intervention for labour.

Reference

P02 Evaluation of an aspiration test to identify accidental intrathecal placement of epidural catheters
KL Crocker, N Harper, NP Hirsch, SM Yentis
Departments of Anaesthesia, Chelsea & Westminster Hospital and National Hospitals for Neurology and Neurosurgery, London, UK

Introduction: Aspiration of epidural catheters is done to detect accidental intrathecal/intravenous placement, but no clinical studies have defined the aspiration test used. We have previously defined an aspiration test based on in vitro studies: a 5-mL syringe, held nozzle down, is aspirated for 10 s to the 3-mL mark, with a positive test denoted by ≥1 mL of clear fluid. The aim of this study was to test this test’s value in vivo.

Methods: After LREC approval and informed consent, we studied two groups of patients: 1) women receiving epidural analgesia for labour and 2) patients undergoing transphenoidal hypophysectomy, requiring lumbar CSF drainage. A 16-gauge Portex epidural catheter was used in both groups via a Tuohy needle (3-5 cm catheter inserted in Group 1 and 5-10 cm in Group 2). Aspiration was performed during labour (Group 1) or immediately after intrathecal placement (Group 2) and recorded as positive or negative as described above.

Results: One hundred and seventeen patients were studied in Group 1 and 31 (16 women) in Group 2. All aspiration tests were negative in Group 1 (no false positives) but there were four false negatives (<1 mL aspirated) in Group 2 (Table).

Table. Characteristics of aspiration test

<table>
<thead>
<tr>
<th>Test Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>87% (95% CI 79-87%)</td>
</tr>
<tr>
<td>Specificity</td>
<td>100% (95% CI 98-100%)</td>
</tr>
<tr>
<td>Positive predictive value</td>
<td>100% (95% CI 91-100%)</td>
</tr>
<tr>
<td>Negative predictive value</td>
<td>97% (95% CI 95-97%)</td>
</tr>
</tbody>
</table>

Conclusion: Our results suggest that a tightly defined aspiration test can perform well in clinical practice but with some caveats: whilst a positive test (≥1 mL clear fluid aspirated) is a reliable indicator of intrathecal placement, a negative test does not reliably exclude this and caution is still required when potentially dangerous doses of local anaesthetic are given down an epidural catheter.

Reference
P03 The effect of sitting on a wedge on maternal positioning for regional anaesthesia
J Poncia, S Malhotra, J Durbridge, SM Yentis
Chelsea & Westminster Hospital, London, UK

Introduction: It may be difficult for mothers to curl into the optimal position for regional anaesthesia, and this may hinder successful spinal or epidural blockade. We investigated whether sitting the mother on the coated foam-rubber wedge that we routinely use to avoid aortocaval compression, can improve her positioning for spinal anaesthesia in the sitting position.

Methods: After Local Research Ethics Committee approval and written consent, 30 mothers with singleton pregnancies ≥36 weeks about to undergo elective caesarean section adopted the curled sitting position for regional anaesthesia, both with and without the wedge (thin end under the buttocks) in random order. One of two blinded anaesthetists graded the mothers’ backs 0-4 according to the ease of palpating the interspaces. Mothers’ height, weight and gestation were also recorded, as were any subsequent difficulty siting the block and mothers’ preferred position.

Results: Data from one mother were lost i.e. n = 29. Mean (SD) age 32.8 (4.8) years; height 164 (6) cm; weight 66.4 (9.9) kg; BMI 24.9 (3.7) kg.m⁻²; gestation 38.8 (0.9) weeks. There was no difference in the back score with or without the wedge (median (IQR [range]) 1 (1-2 [1-3]) and 2 (1-2 [1-3]) respectively; P = 0.38). Placement of the block was difficult (grade 3 or 4) in five women (17%) of whom three were sitting on the wedge during placement. Of those who expressed a preference, six (43%) found it easier sitting on the wedge and eight (57%) found it easier without the wedge.

Discussion: We found that the use of a wedge does not aid in maternal positioning before regional anaesthesia. This may be because we already encourage the women in our unit to adopt the optimal position, aided by the use of pictorial prompts. It is also possible that our assessment tool is too insensitive to detect a difference, although the fact that most women, when asked, preferred not to sit on a wedge, suggests that the wedge should be reserved for the prevention of aortocaval compression and not to assist positioning for the block.

Reference

P04 Quantifying the difficulty of insertion of central neuraxial blocks in the obese and grossly obese parturient
C Johnstone, P Stone, J Reid
Department of Obstetric Anaesthesia, Queen Mother’s Hospital, Glasgow, UK

Introduction: The recent UK Confidential Enquiry into Maternal and Child Health report¹ states that obese patients with body mass index (BMI) greater than 35 kg/m² are at increased risk from anaesthesia.

Aim: To quantify the increased difficulties siting regional blocks and potential delay in achieving block in obese mothers compared to non-obese mothers.

Method: Data was collected prospectively on routine audit forms at time of block siting and analysed for obesity (BMI>35), gross obesity (BMI>40), anaesthetic technique, number of attempts (skin punctures), mode of delivery and obstetric reason for intervention.

Results: Our data set contains 7512 records of mothers who have received anaesthetic intervention.

<table>
<thead>
<tr>
<th>Phenomena</th>
<th>N=6943</th>
<th>N=433</th>
<th>N=123</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal</td>
<td>n=2314</td>
<td>n=152</td>
<td>n=39</td>
</tr>
<tr>
<td>1attempt</td>
<td>1705(73%)</td>
<td>70(46%)</td>
<td>16(41%)</td>
</tr>
<tr>
<td>≥4attempts</td>
<td>80 (3.5%)</td>
<td>25(16%)</td>
<td>16(41%)</td>
</tr>
<tr>
<td>Epidural</td>
<td>n=3335</td>
<td>n=248</td>
<td>n=77</td>
</tr>
<tr>
<td>1 attempt</td>
<td>2507(72%)</td>
<td>143(58%)</td>
<td>39(51%)</td>
</tr>
<tr>
<td>≥4attempts</td>
<td>100 (3%)</td>
<td>30(12%)</td>
<td>12(16%)</td>
</tr>
<tr>
<td>CSE</td>
<td>n=143</td>
<td>n=14</td>
<td>n=7</td>
</tr>
<tr>
<td>1st attempt</td>
<td>101 (71%)</td>
<td>2(14%)</td>
<td>2(29%)</td>
</tr>
<tr>
<td>≥4attempts</td>
<td>12 (8%)</td>
<td>9(64%)</td>
<td>2(29%)</td>
</tr>
<tr>
<td>% EM C/S</td>
<td>1886 (30%)</td>
<td>167 (39%)</td>
<td>50 (41%)</td>
</tr>
<tr>
<td>GA</td>
<td>294 (16%)</td>
<td>20(12%)</td>
<td>5(10%)</td>
</tr>
<tr>
<td>Reg + GA</td>
<td>71</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>GA only</td>
<td>223 (12%)</td>
<td>14(8%)</td>
<td>4(8%)</td>
</tr>
</tbody>
</table>

Top-up of established epidurals provided anaesthesia for emergency C/S (EM C/S) in 753/1886 (40%) of non-obese, 80/167 (48%) obese and 33/50 (66%) grossly obese mothers. Fetal distress was the reason for 40% of the EM C/S in both the obese and grossly obese, compared with 36% of the EM C/S in the non-obese.

Conclusion: Epidurals are relatively easier to site than spinals in the grossly obese. Using an epidural as a conduit for spinal insertion, as in needle-through-needle CSE, may help in siting spinals if the equipment is long enough for the patient. We strongly advise early epidural in labouring women with BMI>35 to minimise the need for hurried spinal or emergency GA in this high risk group with increased incidence of EM C/S.

Reference
P05 Progressive decline in oxygen saturation in the first 12 hours after caesarean section under spinal anaesthesia
M Feast, J Stevens, T Dorman, I Wrench
Royal Hallamshire Hospital, Sheffield, UK

Introduction: We present data from a discontinued trial where continuous pulse oximetry was used following elective caesarean section under spinal anaesthesia. Our review of the literature indicates that this has not been previously reported. We believe that it is important that these data are presented as the results are unexpected and may lead to further research.

Method: Following ethical approval, ASA I and II patients presenting for elective caesarean section under spinal anaesthesia, were randomised to either i) spinal diamorphine 80 µg (9 recruited) ii) spinal morphine 100 µg (6 recruited) or iii) intramuscular morphine 10 mg in theatre (spinal placebo) (9 recruited). All but one of the operations took place in the morning. This double blind study was primarily concerned with postoperative analgesia but continuous postoperative pulse oximetry was included for all patients. Patients were not given supplemental oxygen postoperatively. It had been originally intended that there would be 20 patients in each group, but the study was stopped in 1991 because the principal investigators left.

Results: There were statistically insignificant trends towards higher pain scores, higher morphine consumption and higher sedation scores for the spinal placebo group. There was a progressive decline in oxygen saturation values over the first 12 h postoperatively in all three groups. For the twelfth hour 35% of patients had average oxygen saturations below 93% with one patient having an average oxygen saturation of 86%. For most patients 12 h postoperatively corresponded to 22:00.

<table>
<thead>
<tr>
<th>Spinal drug</th>
<th>0 h</th>
<th>6 h</th>
<th>12 h</th>
<th>18 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>diamorphine</td>
<td>97.9 (1.3)</td>
<td>95.3 (1.4)</td>
<td>93.3 (1.9)</td>
<td>95.2 (1.1)</td>
</tr>
<tr>
<td>morphine</td>
<td>96.2 (2.1)</td>
<td>95.1 (2.1)</td>
<td>94.1 (1.7)</td>
<td>95.5 (1.9)</td>
</tr>
<tr>
<td>placebo</td>
<td>96.2 (2.4)</td>
<td>95.6 (3.5)</td>
<td>93.5 (4.4)</td>
<td>95.3 (1.8)</td>
</tr>
<tr>
<td>all</td>
<td>96.8 (2)</td>
<td>95.4 (2.4)</td>
<td>93.6 (2.9)</td>
<td>95.4 (1.5)</td>
</tr>
</tbody>
</table>

Data are mean (SD)

Conclusion: Oxygen saturation falls steadily for the first 12 h following elective caesarean section under spinal anaesthesia. The cause for the fall is not clear. Even in this low risk group, some patients may need postoperative oxygen.

P06 Correlation of general anaesthetic caesarean section experience with year of specialist registrar training
J M Dolan, S J Young
Dept. of Anaesthesia, Princess Royal Maternity Unit, Glasgow Royal Infirmary, Glasgow, UK

Introduction: Commenting on the recent CEMACH report, an editorial suggested limiting labour-suite cover to Specialist Registrars (SpRs) and above. We aimed to test the assumption that general anaesthetic (GA) caesarean section experience increases with increasing seniority of trainee.

Methods: The audit was conducted from May to November 2004. An anonymous questionnaire with a reply-paid envelope was circulated by NHS Education for Scotland to the base hospital of the 68 full time Anaesthetic SpRs registered in the West of Scotland Deanery. The Trainees were asked to use their personal logbooks to provide detailed answers to a number of training-related factors. From this, we were able to define the number of GA sections performed by each trainee and their current year of training (1 to 5). Pearson’s correlation coefficient was used to describe the association between the two parameters. Additionally we report the sample’s failed intubation rate.

Results: 28 forms were returned giving a response rate of 41%. Pearson’s correlation coefficient for SpR year vs GAs performed was 0.21 (NS).

Year of training vs GA numbers

There were three failed intubations by three trainees in 384 GA sections (0.78% failed intubation rate).

Conclusion: This audit suggests that using trainee seniority as a measure of GA caesarean experience is unreliable, personal logbooks may be a more appropriate measure.

References
P07 Anaesthetic implications of a ‘VBAC’ policy

A Pryn, K Litchfield, E McGrady, S Young.

Department of Anaesthesia, Princess Royal Maternity Hospital, Glasgow, UK

Introduction: Current information suggests that a trial of vaginal birth after caesarean section (VBAC) has a low rate of major neonatal and maternal complications and is an effective method of reducing the rate of caesarean sections. The rate of VBAC in the US lies at 20% while many European countries have VBAC rates of approximately 50%. A British hospital recently reported a VBAC rate of 33.5%. Little is known about anaesthetic implications of a VBAC policy.

Methods: We developed a macro to interrogate the hospital computerised record system to identify retrospectively all women who had two completed pregnancies in the last 4 years with the first pregnancy being a caesarean section. Our teaching hospital maternity unit of approximately 5200 deliveries annually is one of the biggest in Scotland. We identified the method of delivery and divided the patients into three groups: assisted/spontaneous vaginal delivery, emergency caesarean section and elective caesarean section. We also recorded the method of pain relief in the assisted/spontaneous vaginal delivery group.

Results: 127 patients were readmitted for a second delivery after a caesarean section; 25 patients (20%) had an assisted/spontaneous delivery, 37 patients (29%) had emergency caesarean section and 65 patients (51%) had elective caesarean section. In the assisted/spontaneous delivery group 13 patients (10%) required anaesthetic intervention (spinal, epidural or combined spinal epidural anaesthesia).

Conclusions: The VBAC rate in our hospital is 20%. Out of 127 patients presenting with a second pregnancy after caesarean section 115 patients (90%) required anaesthetic intervention in the form of general anaesthesia, spinal, epidural or combined spinal epidural anaesthesia. For the whole obstetric population the anaesthetic intervention rate in our hospital is 48.5%. Having a subsequent delivery after caesarean section is therefore associated with a major use of anaesthetic resources regardless of ultimate mode of delivery.

References

P08 Difference between obstetric assessment and anaesthetic understanding of urgency of caesarean section

A Mynett, I Wrench, A Galimberti

Obstetric Unit, Jessop Wing, Royal Hallamshire Hospital, Glossop Rd, Sheffield, UK

Introduction: The urgency of caesarean section is an important determinant of patient management. In particular it may influence anaesthetic technique, speed of transfer of the patient to theatre and delivery of the baby. In our unit the anaesthetist routinely records the urgency of caesarean section for the anaesthetic database. We have recently compared what the anaesthetists had recorded with the obstetric assessment of urgency.

Methods: Patients who had undergone caesarean section were identified at random from our database along with the urgency as noted by the anaesthetist. The classification of urgency of caesarean section for our unit is: stat (immediate), urgent (<1 h), scheduled (>1 h-<24 h) and elective. The notes were then requested for review by a consultant obstetrician. The obstetrician was unaware of the anaesthetic view of urgency and determined what the obstetric assessments of urgency at the time would have been.

Results: Of 50 sets of notes requested 37 were retrieved to give the following data:

<table>
<thead>
<tr>
<th>Obstetric assessment</th>
<th>What the anaesthetist recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stat</td>
<td>Urgent</td>
</tr>
<tr>
<td>Stat</td>
<td>3</td>
</tr>
<tr>
<td>Urgent</td>
<td>20</td>
</tr>
<tr>
<td>Scheduled</td>
<td>12</td>
</tr>
<tr>
<td>Elective</td>
<td>12</td>
</tr>
</tbody>
</table>

Overall the obstetric assessment disagreed with what the anaesthetist recorded for 32% of cases. There was never more than one level of urgency difference for any caesarean section.

Conclusions: Although the obstetric assessments and what the anaesthetist noted were not contemporaneous, they differed for a large proportion of cases. Failure to appreciate the true urgency of a caesarean section may have serious consequences. Our results indicate that communication between obstetricians and anaesthetists must be improved. We have set up a multidisciplinary group to address this issue.
P09 A review of anaesthetic management of twin pregnancies

J Duffy, C Whymark, P Stone, J Reid
Queen Mother’s Maternity Hospital, Dalnair St, Glasgow, UK

Introduction: The aim of the anaesthetist is to provide adequate analgesia to allow obstetric intervention to aid delivery, particularly of the second twin. There is evidence that epidural analgesia is of benefit in vaginal delivery of twins.

Aim: To determine the proportion of women receiving epidural analgesia and if not then why not. Further, to identify consequent anaesthetic and obstetric interventions with a view to optimising our practice.

Methods: We carried out a retrospective case note review. The computerised Hospital Information System was used to identify all twin pregnancies delivered from January 1998-October 2003. The data were entered into a Microsoft Access database for analysis.

Results: There was a total of 285 twin pregnancies of 28 weeks or more. Planned caesarean section accounted for 86 (30%). Of the remaining 199, 95 had vaginal delivery (48%). However, 65 of these (68%) required obstetric intervention to deliver one or both twins. This rose to 80% when twin 2 was not cephalic.

74/95 (78%) of these parturients received epidural analgesia. The two main reasons for not having an epidural were insufficient time and maternal refusal.

The twin-to-twin delivery interval was <30 min in 88% and <10 min in 17/95 (18%); notably almost two thirds of this group required obstetric intervention for delivery.

The remaining 104/199 cases (52%) required urgent CS. The trend across the 5-year period was of a marked increase in this group; 19 of these (18%) required a GA, the majority due to lack of adequate regional anaesthesia.

Discussion: The high incidence of obstetric intervention means effective regional anaesthesia must be established early to minimise the incidence of general anaesthesia at delivery. As the twin-to-twin delivery interval is unpredictable and variable, this is best achieved with an epidural. We recommend parturients be strongly counselled antenatally to present at the onset of labour and to accept epidural analgesia at this stage.

References

P10 A telephone survey of epidural fixation

O. Mingo, S. Malhotra, S.M. Yentis
Chelsea and Westminster Hospital, London, UK

Introduction: The Lockit® fixation clamp (Portex) is one of many devices for securing epidural catheters. Obesity is known to be a risk factor for catheter migration, and changing from the flexed to the extended position can draw the catheter inwards, possibly contributing to failure of epidural analgesia. We surveyed anaesthetists’ practice for securing epidural catheters and their knowledge of these studies.

Method: The duty obstetric anaesthetists at 50 London hospitals were telephoned and asked confidentially how catheters were fixed on their unit. They were also asked (i) which specific fixing device they had used, if any; (ii) whether they had used or were aware of the Lockit® fixation clamp; (iii) whether they knew about the effects of obesity or back flexion/extension on catheter migration; and (iv) whether they knew of any studies into (ii) and (iii). We then described three relevant studies and asked if these trials would change their practice.

Results: 46 (92%) anaesthetists provided data (Table).

<table>
<thead>
<tr>
<th>Fixation method</th>
<th>Tegaderm®</th>
<th>Lockit®</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever used Lockit®</td>
<td>Yes</td>
<td>27 (59%)</td>
<td></td>
</tr>
<tr>
<td>Aware of risk factors</td>
<td>Obesity</td>
<td>22 (48%)</td>
<td></td>
</tr>
<tr>
<td>Back movement</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware of studies</td>
<td>Lockit®</td>
<td>7 (15%)</td>
<td></td>
</tr>
<tr>
<td>Obesity</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back movement</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Would change practice as a result of studies</td>
<td>Lockit®</td>
<td>31 (67%)</td>
<td></td>
</tr>
<tr>
<td>Obesity</td>
<td>32 (70%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back movement</td>
<td>30 (65%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conclusion: Most anaesthetists do not use a specific fixation device, though most had used at least one. This may reflect lack of confidence in the devices or their unavailability. Despite relevant publications about risk factors for migration, most anaesthetists were unaware of either the risk factors or the evidence, although once made aware, ~ 2/3 said they would change their practice even though they had not read the evidence themselves.

References
P11 Post-caesarean section analgesia: changing practice over four years
AW Johnson, CH Laxton, F Donald.
Anaesthetic Department, Southmead Hospital, Bristol, UK

Introduction: In April 2004 NICE published guidance which stated that women having caesarean section (CS) should be offered diamorphine intrathecally for intra- and postoperative analgesia, and be given non-steroidal anti-inflammatory drugs as an adjunct to other analgesics.1 In our unit in 2000 patients were given fentanyl intrathecally at CS and prn oral analgesia. In 2002 regular postoperative diclofenac and paracetamol had been introduced whilst in 2004 the majority of patients for elective CS received intrathecal diamorphine 300 µg. We present a re-audit of post CS analgesia and compare it with the results of two previous audits at the same unit.

Method: All CS between 15th April and 4th June 2004 were audited. Data were collected prospectively at the time of the operation and at follow up over two days. Data collected included anaesthetic type and the use and dose of intrathecal/epidural opioids. The follow-up data included the presence or absence of side effects, the number of doses of morphine, anti-emetics or naloxone and whether the patient had received the regular oral analgesia as prescribed. Data were compared to those of the first two audits.

Results: 132 CS were audited. The table compares data over the three audits for side effects and women who only needed 1 or 0 doses of morphine postoperatively.

<table>
<thead>
<tr>
<th>Year</th>
<th>2004</th>
<th>2002</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nausea (%)</td>
<td>33</td>
<td>40</td>
<td>42</td>
</tr>
<tr>
<td>Vomiting (%)</td>
<td>21</td>
<td>20</td>
<td>26</td>
</tr>
<tr>
<td>Itch (%)</td>
<td>52</td>
<td>42</td>
<td>24</td>
</tr>
<tr>
<td>1 or 0 morphine doses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spinals (%)</td>
<td>82</td>
<td>52</td>
<td>26</td>
</tr>
<tr>
<td>Epidurals (%)</td>
<td>56</td>
<td>47</td>
<td>32</td>
</tr>
<tr>
<td>GA (%)</td>
<td>40</td>
<td>61</td>
<td>46</td>
</tr>
</tbody>
</table>

In 2004 100% of women were prescribed paracetamol and diclofenac unless contraindicated.

Discussion: The introduction of regular analgesia led to a dramatic reduction in the number of postoperative morphine doses required in 2002. A further decrease in the amount of morphine required in the spinal group in 2004 reflects the introduction of intrathecal diamorphine. Although the incidence of nausea and vomiting has not changed, the decrease in morphine required is at the expense of an increase in the amount of postoperative itching. However, only 6% of patients reporting itch were given treatment with naloxone so perhaps this is not a significant problem. These audit cycles demonstrate clearly how changing practice has had a positive effect in accordance with the NICE recommendations.

Reference
1. www.nice.org.uk/pdf/CG013NICEguideline.pdf (1.6.6/8)

P12 Heparin prophylaxis after caesarean section: has practice changed?
S Malhotra, O Mingo, SM Yentis
Chelsea and Westminster Hospital, London, UK

Introduction: Venous thromboembolism is the leading direct cause of maternal death in the UK1 and the Royal College of Obstetricians & Gynaecologists’ guidelines on prophylaxis after caesarean section advise heparin in at-risk groups.2 Stirrup et al. found that unfractionated heparin, though used in most units at the time, is inadequate in this situation, and suggested a change to low molecular weight heparin at increased doses to provide adequate prophylaxis.3 We investigated whether practice has changed since this work.

Methods: We telephoned the duty anaesthetist at 50 London maternity units and asked about their unit’s protocol for heparin prophylaxis after caesarean section, comparing the results with those of 2000.3

Results: Results of the 46 anaesthetists (92%) who provided data are shown in the Table. Use of unfractionated heparin decreased, and of low molecular weight heparin increased in increased doses increased, between 2000 and 2004 (Fisher’s exact test).

Table. Heparin use in 50 units in 2004 compared with that of a 2000 survey.1 Values are number (%).

<table>
<thead>
<tr>
<th>Heparin use</th>
<th>2000</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Given after all caesarean sections</td>
<td>32 (64%)</td>
<td>28 (61%)</td>
</tr>
<tr>
<td>Given in high-risk cases only</td>
<td>8 (16%)</td>
<td>13 (28%)</td>
</tr>
<tr>
<td>Unfractionated heparin only</td>
<td>17 (34%)</td>
<td>4 (9%)</td>
</tr>
<tr>
<td>Increased dose of low mw heparin</td>
<td>1 (2%)</td>
<td>15 (34%)</td>
</tr>
</tbody>
</table>

Conclusion: Prophylaxis against thromboembolism varies between units in the UK. Some units are still using only unfractionated heparin despite evidence that this is inadequate immediately post partum, even in increased doses,3 although the proportion doing so has fallen by almost three quarters. In the majority of units in which low molecular weight heparin is being used, standard (non-pregnant) doses are still being given, although more units are using an adequate dose than four years ago. It is encouraging that practice has changed in accordance with published evidence; however, many women remain unprotected against thromboembolism after caesarean section.

References
P13 Anaesthetic technique for caesarean section in cases with placenta praevia

C Pradhan, T Isitt, H Nicholls
Department of Anaesthesia, Luton & Dunstable Hospital, Luton, UK

Introduction: Placenta praevia and its variants such as placenta accreta/increta are a major cause of antepartum haemorrhage. There has been a 10-fold increase in cases of placenta accreta in the past 50 years due to the increased caesarean section rate. The choice of safe anaesthetic technique for caesarean section in cases with placenta praevia has been a subject of controversy amongst anaesthetists, particularly so in cases with high risk of major haemorrhage.

Methods: We referred to the obstetric anaesthetic register and noted all the caesarean section cases with placenta praevia and its variants between the period 1st April 2000 to 31st October 2004. We then classified the cases according to different anaesthetic techniques.

Results: Caesarean section cases with placenta praevia and its variants: 49; RA: 32 cases (spinal 28; epidural 2; combined spinal-epidural 2); GA: 17 cases (+ three which had spinal anaesthesia earlier, had to be supplemented with or converted to GA). There were 27 cases with predicted high risk of major haemorrhage (grade IV 19; grade III anterior 5; placenta accreta 2; placenta increta 1; GA 15 cases, RA 12 cases).

Conclusion: Arcario et al. and Fredriksen et al. showed higher use of GA (79% and 74% respectively). In the UK such retrospective analysis was carried out by Parekh et al. Out of 350 cases over a 14-year period, 40% received GA. In our study, the relative percentages of RA and GA were 65% and 35% respectively. This clearly shows an appreciable use of RA in our hospital. It also reaffirms the conclusion drawn in the study by Parekh and others that in most cases of placenta praevia RA is a perfectly reasonable technique for caesarean section.

References

P14 Anaesthesia for operative delivery: an audit

A Morris, F Gill, P Sharpe
Depts of Anaesthesia & Women’s Perinatal & Sexual Health Services. University Hospitals of Leicester NHS Trust, Leicester, UK

Introduction: The Royal College of Anaesthetists (RCA) published an audit recipe book in 2000. Targets were presented for mode of anaesthesia in caesarean section. How do we compare with these targets, and what training do we provide?

Method: Ethical approval was deemed unnecessary for this project. Our database was searched from May to October 2004. Information regarding time of day, urgency, grade of anaesthetist, supervision, and mode of anaesthesia was extracted. Data were subdivided by time of day to match anaesthetic sessions covered by a consultant anaesthetist (0800-1800). Data were analysed using SPSS v9.0.

Results: Our figures met the RCA audit targets for mode of anaesthesia. We retrieved 584 cases, 191 elective and 391 emergencies. Consultants either performed the anaesthetic with a trainee or supervised the trainee, in 263 cases (45%).

<table>
<thead>
<tr>
<th>Time of day</th>
<th>Consultant present</th>
<th>Consultant not present</th>
</tr>
</thead>
<tbody>
<tr>
<td>0800-1800</td>
<td>71%</td>
<td>8%</td>
</tr>
<tr>
<td>1801-0759</td>
<td>29%</td>
<td>92%</td>
</tr>
</tbody>
</table>

Fisher’s exact test. P <0.001.

Seventy-four percent of all emergency work was conducted without consultant supervision; only 17% of elective work was unsupervised. There were 33 planned general anaesthetics, 61% were unsupervised; 12 further cases were converted from regional to general anaesthesia, 33% were not supervised.

Conclusion: It would seem that good supervision was provided in sessions with dedicated consultant presence; however a large proportion of the work on delivery suite is carried out during on-call hours. Many of the general anaesthetics were carried out without supervision. CEMACH tells us that trainees get into trouble with general anaesthesia. Reduction in trainees’ hours is likely to reduce training opportunities further. It may be that to ensure competency we need to extend our training opportunities by providing twilight presence or resident consultant presence on a 24-hour basis.

References
P15 Use of an obstetric anaesthetic database to monitor practice and changes in workload 2001-2004
S Hallworth, D Chitre, C Sadler, P O'Brien
Department of Anaesthesia, The Royal London Hospital, London, UK

Introduction: Data collection in obstetric anaesthesia is now common practice in many units. From data collected over a three-year period we wished to assess changes in clinical practice and workload that may have taken place.

Methods: The obstetric anaesthesia database at the Royal London Hospital was written in October 2000 by the author using Filemaker Pro 4.0v1. The data for this abstract were collected between April 1st 2001 and 31st March 2004. Data collected included anaesthetist details, patient details, obstetric history, primary intervention, technique, complications and obstetric outcome.

Results: In all, 3876 anaesthetic records were examined. The data from our database were compared to data collected from the midwifery department relating to the total numbers of deliveries. The total number of deliveries in our unit was 3525 in 2001-2002, 3832 in 2002-2003 and 3939 in 2003-2004, increases of 8.7% and 2.8%, respectively. Using these figures as denominators, the percentage of obstetric interventions was 37% in 2001-2002, 40% 2002-2003 and 46% 2003-2004. Because of the annual increase of total deliveries, this represents a 16.3% and a 15.4% increase in workload respectively. The caesarean section rates increased from 20% in 2001-2002 to 22% in 2003-2004.

Eighty percent of elective caesarean sections were done under combined-spinal epidural, the remainder under spinal or general anaesthesia. A consultant anaesthetist alone, or with a trainee, was present at 66% of elective caesarean sections and 56% of emergency caesarean sections performed in normal working hours. The percentage of caesarean sections performed under general anaesthesia fell steadily in the three-year periods: 21.4%, 14.3% and 10.2%, respectively.

The incidence of inadvertent dural puncture was 0.6% (18 cases). Of these, 10 developed post dural puncture headache and six required epidural blood patch.

Conclusion: The anaesthetic database is useful in providing accurate information about workload, changes in practice, outcome data and complications. Demonstration of an increase in workload helped us to employ another consultant obstetric anaesthetist in 2002. In addition, the database has provided data for a number of audit projects, allowing us to improve obstetric anaesthetic care.

Reference

P16 Epidural top-up for trial of forceps deliveries that proceed to caesarean section
R Younger, J Reid
Department of Anaesthesia, Queen Mother’s Hospital, Glasgow, UK

Introduction: Trial of forceps (TOF) in theatre represents a significant proportion of obstetric anaesthetic workload. A small number proceed to caesarean section (CS) and it was perceived that this group experienced more pain compared with mothers who proceeded straight to emergency CS under epidural anaesthesia.

Aims: To examine the number of TOF converted to CS and their need for adjuvant therapy under epidural anaesthesia, and local anaesthetic used. Current guidelines suggest 20 mL of 2% lidocaine and adrenaline, 0.5% levobupivacaine, or if the block is well established, 1.5 mL lidocaine and adrenaline per unblocked segment below T4.

Methods: A retrospective audit from the 1st June 2003 to the 31st May 2004 was carried out. Data were obtained from theatre books, delivery summaries and case-note review.

Results: During the 12-month period, there were 203 TOF procedures of which 128 received epidural top-up and 85 spinal anaesthesia. Sixteen of the 128 (16.5%) proceeded to CS under epidural. All 16 cases demonstrated an adequate block before surgery. However, 6 women (37%) required adjuvants, 5 (31%) i.v. narcotics and one GA (6.2%) compared to 14% and 1.4% respectively for epidural CS during the study year. There was no difference between 2% lidocaine or 0.5% levobupivacaine. Women receiving epidural fentanyl bolus experienced less breakthrough pain.

<table>
<thead>
<tr>
<th>Number</th>
<th>T1 (mean)</th>
<th>T2 (mean)</th>
<th>Fent. bolus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequate</td>
<td>10</td>
<td>40.5 min</td>
<td>87 min</td>
</tr>
<tr>
<td>(59%)</td>
<td>(50%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjuvant</td>
<td>6</td>
<td>52.5 min</td>
<td>105 min</td>
</tr>
<tr>
<td>(37%)</td>
<td></td>
<td>(17%)</td>
<td></td>
</tr>
</tbody>
</table>

T1= time from first top-up to start of CS.
T2= time from first top-up to end of CS.
Fent.= fentanyl bolus of 50-100 µg at time of initial top-up.

Conclusion: Although only small numbers were generated in this audit, it confirms a greater need for adjuvants than when proceeding straight to epidural CS. Two factors were consistent with the poorer blocks: a longer interval from the first epidural top-up to both start and end of the CS, and whether or not the patient received a fentanyl bolus at the time of the initial top-up. Time spent attempting a forceps delivery is beyond anaesthetic control but changing the current local guidelines to include a routine fentanyl bolus followed by a re-audit may be helpful.
P17 General anaesthesia for emergency caesarean section in women who received epidural analgesia during labour
S Hallworth, P O’Brien, C Sadler
Department of Anaesthesia, The Royal London Hospital, London, UK

Introduction: A review of our obstetric anaesthetic database highlighted a number of women who had epidurals sited for labour but went on to have general anaesthesia for caesarean section. Given that all the direct anaesthetic deaths in the last Confidential Enquiry into Maternal Deaths were related to general anaesthesia, we decided to conduct a retrospective audit to identify the incidence and circumstances of general anaesthesia for emergency caesarean section in women who received epidural analgesia for labour.

Methods: 611 patients who received epidural analgesia for labour and were then delivered by caesarean section were identified from our obstetric anaesthetic database between 1st April 2001 and 31st March 2004. Of these, 69 had their caesarean sections performed under general anaesthesia; 57 sets of notes were then obtained and in each case the primary reason for general anaesthesia having to be administered was identified.

Results: In total, 11.3% of women who had received epidural analgesia during labour received general anaesthesia for caesarean section. The reasons were:
- 16%: there was no time to establish a block (all grade 1 caesarean sections)
- 11%: the mothers requested general anaesthesia
- 45%: inadequate block following epidural top-up before surgery
- 21%: intraoperative pain sufficient to warrant general anaesthesia.

Of those patients who had an inadequate block or intraoperative pain, 30% had no documentation of the drugs used for the epidural top-ups and where the top-up drugs and doses were stated 73% failed to adhere to departmental guidelines regarding the nature and dosages of drugs administered. 20% of patients had no sensory level documented and 60% had no motor block documented before surgery. Of those who developed intraoperative pain requiring general anaesthesia, only 36% had a sensory level at T4 or above before surgery started. Of grade 2 caesarean sections that had an inadequate block for surgery to begin, only 14% had any attempt to resite the epidural or perform a spinal block. None of the general anaesthetics were associated with failed intubation or other morbidity.

Discussion: The database identified problems with current practice (failure to adhere to guidelines and poor documentation) that have been audited. Solutions have been identified and changes enforced. A prospective audit is now in progress.

Reference

P18 Failure of regional techniques for caesarean sections
S Baskaran, R Akhtar, L Vedham, C Wilkins
City Hospital, Newcastle Road, Stoke-on-Trent, Staffs UK

Objective: The purpose of the audit was to examine the incidence and causes of failed regional techniques and to take remedial action where appropriate.

Method: We conducted a retrospective audit over a period of 2 years (Jan 2002- December 2003). Our regional rates for emergency and elective CS were 70% and 92% respectively. Case notes were identified from the obstetric operation register. We included patients who were intended to have a regional technique but ended up with a GA. We scrutinised the notes for timing, grade of anaesthetist and surgeon, anaesthetic technique, comments and supplement analgesia before a GA and any complications arising.

Results: The proposed standards for failure rates of regional anaesthesia by the Royal College are <1% RA for elective and <3% for emergency CS. Ours were unfortunately higher (2% and 5.4% respectively).

Table: Timing and reasons for conversion to GA (n)

<table>
<thead>
<tr>
<th>Timing</th>
<th>Reason</th>
<th>Spinal</th>
<th>Epidural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-operative</td>
<td>Failure to site</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Inadequate level</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Paraesthesia</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Before delivery</td>
<td>Pain on incision</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Uncomfortable at delivery</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Exteriorisation of uterus</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>After delivery</td>
<td>Prolonged surgery</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Pain on closure</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Bleeding</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Inability to cope</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Notes not clear</td>
<td>Reason not given</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

The identifiable causes were inappropriate testing method,1 small doses of LA and lack of opiates and alkalisation (for epidurals) in the regionals. Use of intraproductive analgesics and effective communication with the patient might have been an important factor in reducing the conversions.

Conclusion: An important strategy in the management of failed regional techniques should include a proper informed consent and documentation of failure of the regional, as it may have medico legal implications. We now have guidelines that address these issues.

Reference
P19 Audit of the administration of antacid prophylaxis to high-risk labouring women on the delivery suite
SR Webster, JM Noblet, NL Lewis
Department of Anaesthesia, St Michael’s Hospital, Bristol, UK

Introduction: Our departmental guidelines state that antacid prophylaxis should be given to all high-risk women in established labour. Women with the following conditions are classified as high-risk: previous caesarean section/uterine scar, previous retained placenta, breech, multiple pregnancy, diabetes mellitus, clinical obesity, preeclampsia, IUGR or other chronic fetal problem, fetal distress/acidosis, failure to progress and antepartum haemorrhage. The aim of the audit was to assess whether prophylaxis was given before anaesthetic involvement in the woman’s care.

Method: Whenever an anaesthetist became aware of a high-risk woman in established labour they recorded whether she had received ranitidine within the last six hours and later noted her mode and place of delivery.

Results: Over a 12-week period, 120 high-risk labours were identified, of which 91 (76%) were given antacid prophylaxis, whilst 29 (24%) were not. Those given prophylaxis were as follows:

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Total number of cases</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antepartum haemorrhage (1)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Clinical obesity (7)</td>
<td>1 (14%)</td>
<td></td>
</tr>
<tr>
<td>Preeclampsia (9)</td>
<td>4 (44%)</td>
<td></td>
</tr>
<tr>
<td>Failure to progress (48)</td>
<td>38 (79%)</td>
<td></td>
</tr>
<tr>
<td>Previous CS / uterine scar (15)</td>
<td>12 (80%)</td>
<td></td>
</tr>
<tr>
<td>Fetal distress/acidosis (21)</td>
<td>18 (86%)</td>
<td></td>
</tr>
<tr>
<td>Breech (8)</td>
<td>7 (88%)</td>
<td></td>
</tr>
<tr>
<td>Diabetes mellitus (1)</td>
<td>1 (100%)</td>
<td></td>
</tr>
<tr>
<td>IUGR or other chr. Fetal problem (4)</td>
<td>4 (100%)</td>
<td></td>
</tr>
<tr>
<td>Multiple pregnancy (6)</td>
<td>6 (100%)</td>
<td></td>
</tr>
</tbody>
</table>

Overall, 19% of these women had a normal vaginal delivery. 63% required caesarean section, 6% of which were performed under general anaesthesia and 18% required an instrumental delivery, of which 72% were performed in theatre.

Conclusion: 76% of our high-risk women delivered in the operating theatre. All of the women who had a general anaesthetic were given ranitidine prophylaxis. Although 76% of women received antacid prophylaxis as per department guidelines, a disproportionate number of women with clinical obesity and preeclampsia did not receive ranitidine. Obesity has been highlighted, in the latest CEMACH report, as being a risk factor for maternal death, difficult intubation and regurgitation of gastric contents.

Reference

P20 Subjective assessment of anaesthetic charts: an investigation into inter-assessor variation
M Coupe, SM Kinsella, A Holdcroft*
Departments of Anaesthesia, St Michael’s Hospital Bristol & *Imperial College London, UK

Introduction: The OAA/CEMACH project is to assess the written record of anaesthetic management of diabetic women undergoing caesarean section (CS). Charts are assessed subjectively and objectively, using professionally recommended criteria.1,2 Inter-assessor variability was assessed.

Method: 20 anaesthetic charts of diabetic women undergoing CS were created to reflect different quality of data recording; 60 anaesthetists of varying experience assessed them. Assessors graded documentation quality [good, adequate, poor], medical assessment [good, adequate, poor] and physiological stability [stable, some instability, prolonged instability (corrected eventually), totally unstable]. Fractional (#) agreement was defined as the number of assessors assigning the most common grade of documentation divided by the total number of assessors. Clinically important errors (a good or adequate chart being assessed as poor, or a poor chart being assessed as good or adequate) were noted and fractional agreement was calculated. Differences were quantified using the unpaired t-test.

Results: There were 10 good, three adequate and seven poor charts according to the most commonly assigned grade. Agreement for poor charts was significantly higher than for good or adequate charts (P <0.01). Four charts had clinically important fractional agreement <0.9. Clinically important agreement for good charts was significantly higher than for adequate or poor charts (P <0.001). Record quality did not correlate with physiological stability.

Conclusion: Subjective assessment of anaesthetic charts identifies poor charts better than good or adequate charts. However good charts were more likely to have a high clinically important fractional agreement, implying charts initially deemed adequate or poor may need to be additionally scrutinised to ensure correct categorisation. Grading of chart record quality was not affected by the presence of physiological instability.

References
P21 A hand-held computer to collect obstetric anaesthetic audit data
V Balasubramani, A Mynett, I Wrench, R Freeman
Department of Anaesthesia, Jessop Wing, Royal Hallamshire Hospital, Glossop Rd, Sheffield, UK

Introduction: We have previously reported the use of a database on a hand-held computer (HC) for collecting epidural audit data. Since July 2003 we have included theatre cases. The information we gather includes patient satisfaction, side effects such as headache and techniques such as the use of regional opioids. We have recently assessed how effective this method of gathering information is. We wished to establish what proportion of patients we were managing to collect data on. We also wanted to find out if we were following up enough patients to make the audit data collected at this time representative of the population.

Methods: The database was constructed in Microsoft SQL Server CE. Data were entered at the time of the anaesthetic intervention and at patient follow-up. The database on the HC was periodically synchronised with the server-based database. Synchronisation involved the transfer of patients for whom data collection was complete, onto the server database. Only datasets for patients who had not yet been followed up were retained on the HC. The data on the server (anonymous) was displayed by means of a series of active web pages on the hospital intranet. Our HC database was checked against the hand-written record in theatre (theatre cases only) and the Protos database currently used on our labour ward. We calculated how many patients were followed up by interrogating the database via the intranet web pages.

Results: The numbers of theatre cases for the period January to October 2004 were 1199 (protos), 1186 (theatre record) and 1034 (HC). Thus 87% of cases were recorded on the HC database. The numbers of epidurals for 2002 and 2003 combined were 3115 (protos) and 3085 (HC) so that 99% of epidurals were captured on the HC database. In total 89% of patients who had been in theatre were followed up, whereas 70% of patients with epidurals who had not been to theatre were seen after delivery.

Conclusion: We have demonstrated that we are able to collect data on the majority of our patients with the HC. This is a powerful tool for gathering anaesthetic audit data on the labour ward.

Reference

P22 Effect of a new targeted anaesthesia form on documentation of regional anaesthesia for caesarean section
J Dick, M Sodhi, H Nicholls, M Ramali, R Fernando, P Tamilselvan, M Columb
Department of Anaesthesia, Royal Free Hospital, London, UK

Introduction: When conducting regional anaesthesia (RA) for caesarean section (CS), best practice includes precise testing of block level (1), preoperative warning of intraoperative pain and clear documentation of any treatments offered and their effect. We modified our departmental obstetric anaesthesia form to improve these practices and subsequently audited the quality of documentation in the new form compared to the old.

Method: Following ethics approval, we retrospectively compared the level of anaesthesia form documentation before and after the introduction, in May 2004, of a new obstetric anaesthesia form. One hundred patient forms were examined between November and December 2003 and compared to 100 forms completed between June and September 2004. Forms were examined for the presence of documentation within 30 data fields including patient data, operation details and regional block information. Statistical analyses included; Fisher Exact, McNemar, Friedman and Dunn’s tests (P<0.05).

Results: Compared to the old form, the proportion of completed data fields was significantly greater with the new form (62.5% versus 69.6%; P<0.001). The new form also significantly improved the documentation of anaesthetist’s name and grade, explanation of risks and benefits of RA, cold level, touch level, time to uterine incision, HR and BP (P<0.01; graph). None of the other fields differed significantly. Within forms, anaesthetists were significantly (P<0.05; Friedman’s test) less likely to document cold/touch levels and motor block with the old form, although this profile improved using the new form.

Discussion: Increased RA documentation was seen after the introduction of the new form, but there is still room for improvement particularly with respect to noting CS operative details.

Reference
P23 Assessment of an intrapartum epidural information sheet

SA Ranson, G Jackson, J Durbridge, M Cox, SM Yentis
Dept of Anaesthesia, Chelsea & Westminster Hospital, London, UK

Introduction: We already give out an information sheet to women before an epidural, describing its insertion, benefits and risks. We now also give out a second sheet after insertion, reminding women how epidurals work and informing them about top-ups and what to expect. We describe here our evaluation of this second sheet.

Methods: After Research Ethics Committee approval, 43 postnatal women who had received the intrapartum information sheet and delivered vaginally were invited to participate. They were asked if they had remembered receiving the information sheet, how useful they found it (0: no use; 10: extremely useful), and when they thought would have been the best time to receive it.

Results: The women were aged 32 (± 4.36) years; 34 (79%) were primiparous and 32 (74%) had received the first information sheet. Although all women interviewed had received the second (intrapartum) sheet, 14 (33%) did not remember it or had not read it. Of those women who read the sheet, 28 (97%) gave a score of 5 or more for how useful they found it at telling them about epidurals overall, while all 29 gave a score of 5 or more for the information about how the epidural would be managed. Nineteen women (44%) would have liked the sheet at the antenatal clinic and 10 (23%) felt that the best time to receive the sheet was when the anaesthetist was about to place the epidural. The partners of 19 women (44%) read the sheet and found it useful, passing on the information or reading it aloud. All the women felt that they were adequately informed overall and had received comprehensive information from the anaesthetist inserting the epidural.

Discussion: Those women who read the intrapartum information sheet found it informative and useful. However one third did not read it or did not remember receiving it. We find it interesting that almost half the women felt they should receive the sheet antenatally, since all women in our unit are routinely given the OAA leaflet ‘Pain relief in labour’ antenatally. Since all the women felt adequately informed overall, and given that the impact of the second (intrapartum) sheet is modest compared with that of the first (pre-epidural) sheet, we conclude that in our unit, the second information sheet does not merit routine distribution after an epidural is sited in labour.

Reference

P24 Does an obstetric anaesthetic high-risk service alter parturients’ management plans?

T Duggan, KN Litchfield, S Young
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Introduction: The recently published CEMACH report mentions both having strategies for high risk deliveries, and the use of senior staff to reduce risk. We aimed to analyse the management outcomes in a consultant lead obstetric anaesthetic high risk service.

Methods: We conducted a retrospective audit of the high risk database in a teaching hospital maternity unit of approximately 5000 annual deliveries. Obstetric patients identified as high-risk at antenatal clinic were referred to a consultant obstetric anaesthetist, who assessed the patient and formulated a management plan. We sub-categorised the type of management plan into one of four levels of intervention. The data were collated and stored as a Microsoft Excel database and missing data were obtained from the hospital computer database. Data are presented as statistics.

Results: Over a one year period, 2002-2003, 123 high-risk obstetric cases were identified, with eight patients excluded for incomplete data. The median age was 31 (16-46). The management plans were divided into four categories: 57 (50%) women, required reassurance only, 35 women (30%) required a specific anaesthetic/analgesic plan for labour, 12 women (10%) required results of tests and only 7 women (6%) required a multidisciplinary team approach. In all but 4 cases (4%), the management plan was followed. In two cases there was insufficient time to institute the plan before labour, in another case labour was too short and in the final case management difference was due to anaesthetic preference. The SVD rate was 37%. There were no critical incidents, no adverse maternal outcomes and no admissions to ITU.

Conclusion: This audit suggests good outcomes and a high compliance with consultant derived management plans. However in this sample only half the patients needed a specific management plan. This suggests consultant time may not be sufficiently focussed on the right patients, and suggests further work may be required on the referral protocols.

Reference
P25 Are we teaching our midwives well enough? A questionnaire study on midwives’ knowledge of epidurals and their undergraduate and postgraduate teaching on the subject

C Smith, K O’Brien.
St. Mary’s Hospital, Manchester, UK

Introduction: Caring for women with an epidural is a significant part of a midwife’s workload, with an epidural rate of over 1100/year at the unit studied. This questionnaire study was undertaken with the aim of improving the epidural teaching provided by the obstetric anaesthetists.

Method: 72 questionnaires were distributed to midwives working on the delivery suite or post-natal wards in a large tertiary referral centre. The questionnaire looked at the training about epidurals and resuscitation the midwives had received. We were also interested in knowledge of serious epidural complications and sensory level testing.

Results: 51 questionnaires were completed, producing a response rate of 71%. Responses were as follows:
- Mean length of postgraduate experience 7.2 years.
- 50/51 (98%) had received training in basic or advanced life support
- 44/51 (86.3%) within the last 2 years
- 36/51 (70.6%) had lectures on epidurals during their training.
- 44/51 (86.3%) had had some postgraduate teaching on epidurals.
- 49/51 (96.1%) felt anaesthetists should play a role in the postgraduate epidural teaching
- 44/51 (86.3%) felt that postgraduate epidural training should be given 6 month – 2 yearly
- 21/51 (41.2%) remembered their post-graduate epidural training dealing with serious complications and could state at least 3 complications.
- When asked which of the spinal nerve roots transmitted pain in labour, only 3/51 (5.9%) gave the completely correct answer.
- 5/51 (9.8%) checked sensory levels routinely
- 34/51 (66.7%) stating that they had never been taught how to check sensory levels.

Discussion: Although 86.3% of the midwives had attended at least one postgraduate teaching session on epidural analgesia, <50% could remember three complications of epidurals. Other important areas of knowledge and skills were found to be lacking, such as the ability to check the sensory level, although this has been found to be a skill that can be easily taught to midwives.1 We identified a need for ongoing epidural education and have changed our teaching programme to include mandatory update sessions.

Reference

P26 A DGH experience of postpartum hysterectomies

M Achawal, D Radhakrishnan, S Shah
Department of Anaesthesia, Whipps Cross University Hospital, London, UK

Introduction: Massive obstetric haemorrhage remains a challenge for anaesthetists. In the light of the Confidential Enquiry into Maternal and Child Health (CEMACH) we reviewed our district general hospital experience over the past four years.

Method: Postpartum hysterectomies performed at our hospital between 2001 and 2004 were studied retrospectively. Indications, risk factors, blood loss, consultant involvement and perioperative management were evaluated.

Results: Out of 16 167 deliveries 13 hysterectomies were performed for obstetric indications (incidence 0.08%). Six of the thirteen patients had placenta praevia. Two of these patients also had associated posterior wall fibroids and three had had more than one previous section. Five patients had atomic postpartum haemorrhage (PPH). One case had existing coagulopathy due to intrauterine death. One patient with atomic PPH refused blood transfusion on religious grounds and subsequently died on the ITU. Estimated blood loss in this series ranged from 6-10 L and was promptly treated. Oxytocics, blood, blood products and antifibrinolytics were judiciously used with aggressive surgical management. In four patients B-Lynch suture was used and four had internal iliac artery ligation. Invasive monitoring was instituted early and all patients received postoperative ITU management. Eleven of the 13 patients were discharged from ITU after 24 h. Consultant anaesthetist, obstetrician and haematologist were directly involved in the care of all patients. Interventional radiological facilities were not used.

Conclusion: Placenta praevia was the most common indication for postpartum hysterectomy. Previous caesarean sections, myomectomy and presence of uterine fibroids were other major risk factors. Association of two or more risk factors and/or other co-morbidities should alert the anaesthetist of possible PPH. Multidisciplinary approach and early aggressive management helped positive outcome in our series. However radiological intervention remains underused in a district general hospital setting.

References
P27 National obstetric intubation equipment survey
M Carraretto, A Bullough
Department of Anaesthesia, Great Western Hospital, Swindon, UK

Introduction: Experience in general anaesthesia for caesarean section is falling due to an increase in trainee numbers and a decrease in the percentage of caesarean sections being carried out under GA. Failed intubation is more common in obstetric patients. It usually occurs in emergency out-of-hours cases being performed by trainees. The aims of this survey were to identify whether failed intubation rates remained high, if effective training was in place and what equipment was being made available in the obstetric unit theatre.

Method: Following approval from the Obstetric Anaesthetists’ Association, a postal questionnaire was sent to the lead obstetric anaesthetist of each of the 241 obstetric units in the United Kingdom.

Results: In total, 187 completed questionnaires were returned generating a response rate of 78%. The caesarean section rate for 2003 was 23% with a general anaesthesia rate of 15%. The incidence of failed intubation was 1:309. Failed intubation algorithms were available in 97% of units but only 33% implemented practice drills. Every unit had a normal handled laryngoscope with an adult Macintosh blade; 96% had a Macintosh long blade and 94% had a polio blade; 98% also possessed a McCoy blade but only 80% had a short handle available. Bougies were universal and stylets were 87% available. A size-7 endotracheal tube was the most common (100%) ETT in use, 89% of units had a size 6 and 60% a size 5.5. Every unit stocked a LMA and 37% documented no other additional airway equipment. The other most commonly used airway adjuncts were the Combitube and Proseal LMA. 96% of units had a cricothyrotomy set and equipment to ventilate it. 88% of hospitals retained all their equipment on one trolley, located in the obstetric theatre. A fibreoptic scope was present in only 8% of obstetric theatres otherwise it took an average of 10.3 minutes to obtain one from elsewhere in the hospital.

Conclusion: The incidence of failed intubation was 1:309, similar to the often quoted 1:300, despite the absence of failed intubation practice drills and increased usage of regional techniques. A laryngoscope, endotracheal tube, bougie and LMA were the mainstay pieces of airway equipment being used. The fibreoptic scope was not readily available in the obstetric theatre.

References

P28 Anaesthesia for mothers of babies undergoing fetoscopic tracheal occlusion (FETO): experience gained during fourteen cases
R Addison, J Dasan, VA Skelton
King’s College Hospital, London UK

Introduction: Congenital diaphragmatic hernia is a sporadic defect with a birth prevalence of approximately 1:4000, and an overall mortality of 50%. Babies with severe diaphragmatic hernias (defined by a lung area to head circumference ratio of less than one) have a mortality approaching 100%, from lung hypoplasia, abnormal pulmonary vasculature and pulmonary hypertension. A novel minimally invasive procedure has been developed involving the insertion of a balloon, guided by fetoscopy and ultrasound, into the trachea of affected fetuses at 26-28 weeks. Obstruction of the trachea results in expansion of the lungs by retained pulmonary secretions and lung stretching. The first three babies were delivered by EXIT procedures to allow removal of the balloon; subsequently the balloon was removed electively at 34 weeks by fetoscopy or punctured before delivery.

Anaesthetic management: This evolved with increasing experience. Initially, the mothers were given a standard volatile general anaesthetic and an infusion of glyceryl trinitrate to relax the uterus. Oral nifedipine is now given preoperatively to the mother for uterine relaxation and use of a combined spinal-epidural anaesthetic technique allows for the variable duration of the procedure (19-114 min). Fetal anaesthetic agents (atropine, fentanyl and pancuronium) prepared by the anaesthetic team, are injected intramuscularly under ultrasound guidance before fetoscopy.

The first fourteen patients: Patients 1-3 were given a general anaesthetic, patient 4 a combined spinal-epidural, patients 5 and 6 a spinal. We then returned to combined spinal-epidural anaesthesia for the remainder as the learned technique of choice. Hypotension was a problem in patients receiving general anaesthesia with GTN; blood pressure was maintained with a phenylephrine infusion. Regional anaesthesia to T6 was satisfactory in all cases, with no conversion to general anaesthesia. In all cases the balloon was successfully inserted and well tolerated by the mother. Fetal mortality overall was 50%.

Conclusion: FETO may offer some hope for babies with severe congenital diaphragmatic hernia. Combined spinal-epidural anaesthesia is the technique of choice.

References
P29 The impact of changing from isolated unit to teaching hospital site on obstetric HDU admissions
C Grant, SJ Young
Department of Anaesthesia, Princess Royal Maternity Unit, Glasgow Royal Infirmary, Glasgow, UK

Introduction: The CEMACH report1 for 2000 to 2002, suggests that isolated obstetric units have problems managing ill mothers. If this were true, we might expect an isolated site to admit fewer patients to obstetric HDU and transfer out more ill patients than would be the case in a unit on an integrated hospital site. We aimed to use our obstetric high dependency unit (HDU) records to test this.

Methods: The Princess Royal Maternity Unit (PRMH) at Glasgow Royal Infirmary is a direct replacement for the Glasgow Royal Maternity Hospital (GRMH), with no alteration of catchment area or services provided. The new HDU therefore provides a service for the same population as the pre-existing high dependency room, and offers the same level of facilities. We used the admission registers from the 12 months leading up to the move (October 2001) and those of the 12 months after the move. From these we were able to establish the admission numbers, the rate of transfer to another critical care area (escalation of therapy), and any mortalities. The data only included patients admitted to HDU, patients transferred directly from obstetric theatre or labour suite to another critical care area (for example ITU) do not appear in this audit.

Results: Before the move, there were 34 admissions, one transfer from obstetric HDU (to renal) and no mortality. After the move there were 89 admissions, no transfers and no mortality.

Conclusion: Comparison of the two data sets shows an increase in HDU activity after the move to an integrated site. This would be consistent with the hypothesis that the integrated site admits more patients to obstetric HDU, and fewer directly to other critical care areas.

Reference

P30 Regional anaesthesia for caesarean section in severe aortic stenosis: a series of five cases
C Gleeson, M Scrutton, S Kinsella, G Stuart, I Ryder
United Bristol Healthcare NHS Trust, Bristol, UK

Introduction: Anaesthetic technique for caesarean section in women with severe aortic stenosis remains controversial. We present a series of five patients delivered under regional anaesthesia (RA).

Methods: Anaesthesia was managed jointly by an obstetric and a cardiac anaesthetist. In three cases RA was established using 28-guage spinal catheters (SC), a 2.5-5 mg loading dose of isobaric bupivacaine followed by increments of hyperbaric bupivacaine (total dose range: 8.75-12.5 mg) and diamorphine 300-500 µg. In two cases RA was established with combined spinal epidurals (CSE): hyperbaric bupivacaine 3.75 mg and fentanyl 25 µg intrathecally followed by incremental epidural doses of 0.5% bupivacaine (total epidural volume: 15 mL).

<table>
<thead>
<tr>
<th>Gestation at CS</th>
<th>Valve area</th>
<th>Maxi gradient</th>
<th>RA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 52/40</td>
<td>0.8 cm²</td>
<td>123 mmHg</td>
<td>CSE</td>
</tr>
<tr>
<td>2 35/40</td>
<td>a/k</td>
<td>92 mmHg</td>
<td>SC</td>
</tr>
<tr>
<td>3 35/40</td>
<td>a/k</td>
<td>112 mmHg</td>
<td>SC</td>
</tr>
<tr>
<td>4 37/40</td>
<td>a/k</td>
<td>100 mmHg</td>
<td>CSE</td>
</tr>
<tr>
<td>5 39/40</td>
<td>0.9 cm²</td>
<td>83 mmHg</td>
<td>SC</td>
</tr>
</tbody>
</table>

Results: Patient 1 developed pulmonary oedema immediately after delivery. This was managed with oxygen, furosemide 20 mg and adrenaline 20 µg and resolved within 10 min. All other anaesthetics were uneventful. All patients were monitored on the cardiac ICU postoperatively. Patient 1 had an aortic valve replacement 7 days after delivery, the other four were discharged home for surgery at a later date.

Discussion: Although the ‘cardiac GA’ produces ideal conditions for ‘cardiostable’ intubation, it fails to address the well-recognised risks of airway complications in the obstetric population. Furthermore, extubation occurs at a time when the cardiac lesion remains uncorrected and the immediate postpartum physiological changes of pregnancy are at their greatest. Incremental RA under full invasive monitoring improves peroperative cardiovascular stability compared to a single shot spinal. Inclusion of a spinal component provides better anaesthesia than using an incremental epidural alone.

Conclusion: This series demonstrates that low dose CSE or SC anaesthesia can be considered for caesarean section in severe aortic stenosis and allow the mother the option to be awake for the delivery of her baby.

Reference
P31 Spinal anaesthesia for caesarean section in a parturient with Ehlers Danlos syndrome type IV
J Raskovic, J Bamber and JA Pickett
Addenbrooke’s Hospital, Cambridge, UK

Introduction: The Ehlers Danlos syndrome (EDS) is a group of inherited connective tissue disorders characterised by the abnormal production or secretion of collagen. EDS Type IV is rare but important because of its association with significant complications (e.g. arterial, bowel and uterine rupture) and an increased bleeding tendency. Life expectancy is reduced and mortality during pregnancy increased. We report the successful administration of spinal anaesthesia for caesarean delivery in a parturient with biochemically typed EDS IV.

Case Report: A 26-year-old woman in her first ongoing pregnancy was referred to the anaesthetic clinic. Her father had died prematurely from a ruptured aorta and she gave a history of easy bruising. The diagnosis of EDS IV had already been confirmed with protein biochemistry showing reduced procollagen type III. Coagulation studies and platelet counts were normal. At 34 weeks gestation there were concerns for the fetus and delivery by caesarean section was arranged. A frank discussion about the risks and benefits of regional versus general anaesthesia for EDS IV took place with the parturient, who elected to have spinal anaesthesia. A subarachnoid block was performed with a 25-gauge Whitacre needle and the intraoperative course was uneventful. Blood loss was 800 mL.

Discussion: EDS IV predisposes to major vessel rupture, and an increased bleeding tendency even in the presence of normal tests for haemostasis. The bleeding tendency is thought to be due to abnormal capillary structure with a deficiency of perivascular collagen. Avoidance of regional anaesthesia has previously been recommended. However, the use of combined spinal epidural (CSE) anaesthesia for caesarean delivery and epidural analgesia for labour have subsequently been reported. After an informed discussion our parturient chose spinal anaesthesia above CSE or general anaesthesia for a caesarean delivery. CSE involves the use of a larger epidural needle but provides additional cover for a possibly protracted caesarean section. Risks for general anaesthesia in EDS IV include atlanto-axial subluxation and tissue trauma. In conclusion, ideal analgesia and anaesthesia for labour and delivery in parturients with EDS IV remains uncertain. Women with this condition should therefore be provided with sufficient information to make an informed choice.

References

P32 Epidural catheters; are you using the most suitable design?
C Collier
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Introduction: Many types of epidural catheter are available to the obstetric anaesthetist, but not all are entirely ideal for use in the parturient.

Method: Over the last 15 years, we have had the opportunity, following ethics committee approval, of assessing 13 different types of epidural catheter, including some prototypes, from seven manufacturers. The catheters have varied in their construction material, gauge, radio-opacity and number of openings (or eyes) and their positioning. Use of the catheters has been closely monitored in over 20 000 patients in labour and for caesarean section. One hundred and forty patients consented to postpartum epidural contrast injection and radiographic screening, when there appeared to have been a catheter-related problem.

Results: Our early work demonstrated the advantages of using a catheter with three lateral eyes, rather than a terminal hole in reducing the incidence of failed blocks and catheter replacement. In addition, closer positioning of the eyes was suggested to reduce the incidence of multicompartment block. The ‘closer-eye catheter’ has proved to be satisfactory in more than 10000 parturients, with only one case of multicompartment block being detected. The ‘softer’ catheters incorporating wire coils, now becoming available, appear to be associated with a reduced incidence of paraesthesia on insertion (<5%), and bloody taps (<2%). However, they are often more difficult to insert and more likely to be displaced away from the midline of the epidural space and in an unintended caudal direction, producing unilateral or ‘patchy’ anaesthesia.

Conclusion: Care should be taken when new types of epidural catheter are introduced into obstetric practice to ensure that they confer real advantages. The ideal catheter should have three closely spaced lateral eyes, be easy to insert, without significant paraesthesia or trauma to epidural veins, and should follow the intended direction of insertion within the epidural space. A soft but robust catheter that will resist kinking and stretching as well as breakage is required.

References
P33 Supplementation during caesarean section under regional anaesthesia

HV Hopwood, JG Jenkins
Department of Anaesthesia, Royal Surrey County Hospital, Guildford, UK

Introduction: It has been suggested that regional anaesthesia (RA) to general anaesthesia (GA) conversion rates should be below 1% and 3% for elective and emergency caesarean section (CS) respectively, although published studies have higher rates than this. There are few published data on the need for supplementary analgesia during CS under RA. We present data from a prospective observational study.

Method: Data were collected on all CS done under RA in seven hospitals, including the urgency of CS, the number of previous CS, the grade of anaesthetist, the anaesthetic technique, any supplementary analgesia given and unplanned conversion to GA. Results were subjected to simple descriptive and relative risk statistical analysis.

Results: During the study 472 CS were done under RA; 40 patients (8.5%) required supplementary analgesia and in 8 (1.7%) RA was converted to GA. There were 222 elective CS (217 spinal, 10 supplemented; 4 CSE, 1 supplemented; 1 epidural). There were 252 emergency CS (129 spinal, 10 supplemented, 5 converted to GA; 4 CSE, 1 supplemented; 119 epidural, 18 supplemented, 3 converted to GA). The relative risk (RR) of needing supplementation at emergency v. elective CS was 0.65 (95%CI 0.16 to 2.66). RR of needing supplementation with trainee v. consultant anaesthetist was 1.33 (95%CI 0.68 to 2.63). The most frequent supplementation was i.v. opioid.

Conclusion: There was a significantly higher risk of needing supplementation during emergency CS, 11.5% v. 5% during elective CS. All the unplanned GAs were in emergency cases; 15.1% of epidurals used for emergency CS needed supplementation and 2.5% were converted to GA. Figures of 26.5% and 3.6% respectively have been reported previously.

References

P34 Epidural top-up in combined spinal epidural analgesia has a time-limited direct spinal effect

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Introduction: Volume effect of epidural top-up in combined spinal-epidural (CSE) is well known. The aim of this prospective double blind randomised study was to investigate if the epidural component of epidural top-up could pass through the spinal puncture into the CSF to have the spinal effect, injected immediately after the spinal component of CSE in early labour and to find the time duration of the passage of epidural top-up.

Methods: After ethics approval and informed consent, 50 healthy women with singleton pregnancy at 3-5 cm of cervical dilatation requesting epidural analgesia were recruited to receive CSE analgesia using a needle-through-needle technique with a 27-gauge Whitacre needle. They were randomised into two groups: saline group (NS) received 10 mL of normal saline and bupivacaine group (B) received 10 mL of 0.1% bupivacaine top-up, 5 min after the intrathecal injection of bupivacaine 1 mg with fentanyl 5μg in normal saline to make 2 mL. Pain was assessed using verbal analogue scale (VAS=0-100) score and effective pain relief was defined as a VAS <20 after 10 min. Pain score, sensory block level to cold, motor block, maternal and fetal vital signs were recorded as baseline and every 5 min for first 30 min, then every hour until delivery. If any parturient had a VAS score>20 after 10 min, she received rescue top-up with 10 mL of 0.1% bupivacaine at 15 min. If pain was not relieved, another 5-mL top-up of the same was given at 20 min. To detect a difference of 34% (NS=35% vs B=1%) in the incidence of VAS >20 at 10 min, 25 women were required in each group with a power of 90% and a two-sided test of 5%.

Results: The groups were similar in demographics and obstetric data. Those in group B were 2.08 times more likely than the saline group to have no pain at 10 min. (Relative Risk = 2.08, 95% CI 1.38 to 3.38, P <0.001, χ² test). At 10 min and 20 min, the median sensory level of B and NS groups were T7 and T11 respectively (P <0.001, Mann Whitney U test), though NS group received similar bupivacaine dose at 15 min. The median differences in block level at 5 and 10 min for B and NS groups were 5 and 1 respectively (P <0.001).

Conclusion: Immediate 10-mL epidural top-up of anaesthetic CSE does have direct spinal effect as epidural content may pass into the CSF through the spinal puncture. The movement of the content is time limited, as the effect is less significant after 15 min.
P35 Rate of pain during caesarean section after block testing using loss of cold sensation
SM Kinsella
Department of Anaesthesia, St. Michael’s Hospital, Bristol, UK

Introduction: Loss of touch sensation (anaesthesia) has been suggested to be the ‘gold standard’ for testing regional anaesthetic (RA) block.1 We examined audit data to determine the risk of intra-operative pain during caesarean section (CS) using loss of cold sensation.

Methods: Data were collected prospectively between 1/6/99 and 31/5/04. Satisfactory block was defined as no sensation of cold to ethyl chloride spray between T4 and S5, and anaesthesia to a 19-gauge needle along the incision line. Pain was defined as that requiring treatment, usually with i.v. alfentanil or nitrous oxide.

Results: 4806 CS were carried out with RA; 4710 were analysed after exclusions; 112 CS were started with an unsatisfactory block of whom 39 had pain (34.8%) compared to 286 with pain in 4598 satisfactory blocks (6.2%) [sensitivity 0.12, specificity 0.88, PPV 0.35, NPV 0.94]. Particular aspects of poor block with pain were, for all RA, ‘upper level ≤T5’ (pain in 21/68), ‘not anaesthetic at T12’ (12/27) and >1 factor (6/10). Specific for epidural was ‘sacral sparing’ (4/4) and ‘cold on legs or feet’ (5/15). Rates of pain are shown in the table:

<table>
<thead>
<tr>
<th>Insertion position</th>
<th>Pre-op change to other anaesth</th>
<th>Pain (incl. GA)</th>
<th>GA during operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>All cases</td>
<td>31/1606</td>
<td>44/1575</td>
<td>3/1575</td>
</tr>
<tr>
<td>Urgency 1 or 2</td>
<td>(1.9%)</td>
<td>(2.8%)</td>
<td>(0.2%)</td>
</tr>
<tr>
<td>Urgency 3 or 4</td>
<td>21/1288</td>
<td>30/1267</td>
<td>2/1267</td>
</tr>
<tr>
<td>Spinal LA</td>
<td>(1.6%)</td>
<td>(2.4%)</td>
<td>(0.2%)</td>
</tr>
<tr>
<td>Spinal LA</td>
<td>10/318</td>
<td>14/308</td>
<td>1/308</td>
</tr>
<tr>
<td>R lateral, no change</td>
<td>19/1285</td>
<td>30/1266</td>
<td>2/1266</td>
</tr>
<tr>
<td>R lateral after sitting attempt</td>
<td>7/133</td>
<td>5/126</td>
<td>0/126</td>
</tr>
<tr>
<td>Sitting, no change – obesity</td>
<td>1/105</td>
<td>7/104</td>
<td>1/104</td>
</tr>
<tr>
<td>Sitting, no change – anaesth / woman preference</td>
<td>1/105</td>
<td>7/104</td>
<td>1/104</td>
</tr>
<tr>
<td>Sitting, no change – predict difficult</td>
<td>0/18</td>
<td>1/18</td>
<td>0/18</td>
</tr>
<tr>
<td>Sitting after R lateral attempt</td>
<td>2/59</td>
<td>1/57</td>
<td>0/57</td>
</tr>
</tbody>
</table>

Discussion: In the presence of an unsatisfactory block tested by cold, pain was felt by 22% with spinal and 45% with epidural, compared to 26% and 53% using touch at or below T6 (albeit without opioid).1 On the other hand we found pain after spinal with satisfactory block in 6%, compared to a report of 9% using touch to T5.2

References

P36 Failure of spinal anaesthesia at elective caesarean section: effect of insertion position
SM Kinsella
Department of Anaesthesia, St. Michael’s Hospital, Bristol, UK

Introduction: The sitting position for spinal insertion at CS may lead to more failures.1,2 Patient factors might influence the choice of insertion position and have an influence on block spread. Data from a prospective audit were examined.

Methods: Data were collected from 1/6/99 to 31/5/04; 1606 elective CS had an intended or actual spinal dose of hyperbaric bupivacaine 2.5 mL with diamorphine 0.3 mg, and intended or actual insertion position of right lateral or sitting. Pain during operation was defined as that requiring treatment,3 usually with i.v. alfentanil or nitrous oxide.

Results: Maternal position for the initial spinal attempt was right lateral in 1344 cases and sitting in 262. The table shows the actual insertion position with failure rates (omitted three sitting insertions for unknown reason).

Discussion: This audit indicates that attempts to establish spinal have a higher failure rate if the woman is sitting because of obesity, but the likelihood of pain during the operation is not increased. In contrast, the sitting position used because of anaesthetist or patient preference is associated with a higher risk of pain than planned right lateral insertion.

References
P37 A prospective audit of factors influencing failure of epidural top-up anaesthesia at caesarean section
SM Kinsella
Department of Anaesthesia, St. Michael’s Hospital, Bristol, UK

Introduction: Topping up epidurals for caesarean section is a balance between speed and safety. Debate over what to use continues despite RCTs.1 We examined audit data for clinically measurable effects.

Methods: Data were collected from 1/6/99 to 31/5/04. Satisfactory block was defined as no sensation of cold T4 to S5 (ethyl chloride) + anaesthesia to 19-gauge needle at T12. Outcomes examined were ‘likelihood of achieving satisfactory block’ and ‘change to other anaesthesia pre-operatively or per-operative pain.’

Results: 1286 CS were conducted with epidural top-up anaesthesia. Exclusions (missing data or non-standard anaesthesia) left 1237. Three women had high block anaesthesia. Exclusions (missing data or non-standard) 1286 CS were conducted with epidural top-up

Using logistic regression, increasing local anaesthetic volume, absence of adrenaline, and increasing urgency were associated with a greater failure risk [adequate block OR (95%CI) adren 1.76 (1.25-2.48) urg 0.62 (0.42-0.90); other anaesth or pain OR adren 0.544 (0.41-0.72) urg 1.55 (1.12-2.16)].

Discussion: Type of local anaesthetic chosen for epidural top-up did not affect the success of top-up anaesthesia, but adding adrenaline did. Larger top-up volumes were linked to greater risk of failure, possibly reflecting poor catheter location. Urgency may sometimes be reduced by intra-uterine fetal resuscitation.

Acknowledgement: Dr Tim Lovell (statistics)

References

P38 Epidural levobupivacaine for emergency caesarean section
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Introduction: Although epidural anaesthesia is slow in onset, it can provide a rapid option for emergency caesarean section if a functioning epidural catheter is in situ. Although 0.75% ropivacaine is relatively safe and reliable for this purpose,1 it is expensive. We therefore examined whether levobupivacaine, 0.5% or 0.75% might be a useful alternative.

Method: After ethics approval, women receiving epidural labour analgesia were asked to take part if they required caesarean section. Sixty-three consenting women were randomly allocated to receive bupivacaine 0.5% (Bup) or levobupivacaine 0.5% (L0.5) or 0.75% (L0.75), in an initial dose of 15 mL, with supplements to a maximum of 30 mL. Sensory block to cold, motor block (modified Bromage score), arterial pressure, epidural dose (6-mg boluses given if blood pressure <80% of baseline) and symptoms were recorded regularly, with pain scores (0-10, verbal numerical scale) at incision, delivery and peritoneal closure. Power calculation suggested that 16 were needed in each group to detect a 7-min difference in onset to T4. Mann Whitney and χ² tests were used as appropriate.

Results: There were no significant differences between treatments (table). In four cases in the L0.5 group the block never attained T4 but GA was needed in only one.

Discussion: Levobupivacaine showed no dose effect, which may reflect reduced vasoconstrictor effect at high concentration. This study suggests that levobupivacaine offers no advantage over bupivacaine 0.5% for epidural augmentation.

Acknowledgement: Dr Tim Lovell (statistics)

References

Using logistic regression, increasing local anaesthetic volume, absence of adrenaline, and increasing urgency were associated with a greater failure risk (both definitions) [adequate block OR (95%CI) adren 1.76 (1.25-2.48) urg 0.62 (0.42-0.90); other anaesth or pain OR adren 0.544 (0.41-0.72) urg 1.55 (1.12-2.16)].

Discussion: Type of local anaesthetic chosen for epidural top-up did not affect the success of top-up anaesthesia, but adding adrenaline did. Larger top-up volumes were linked to greater risk of failure, possibly reflecting poor catheter location. Urgency may sometimes be reduced by intra-uterine fetal resuscitation.

Acknowledgement: Dr Tim Lovell (statistics)

References
P39 Hydration status of patients presenting for elective caesarean section

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Introduction: This study aimed to quantify the hydration status of women before elective caesarean section. The relationship between oral fluid intake and biochemical markers of dehydration was investigated. Bedside testing of urine was compared to laboratory investigations for detecting some of the effects of routine preoperative starvation.

Methods: This ethics committee approved observational cohort study recruited 63 healthy full term pregnant women presenting for elective surgery. Patients were questioned on symptoms of dehydration and were asked to estimate recent fluid intake using graduated containers. The osmolality of blood and urine samples were measured. The Bayer 8SG dipstick and Clinitek automatic reader were used to quantify urine specific gravity. This dipstick test of specific gravity is unaffected by glucose or protein in the urine.1

Results: Complete data were collected for 58 women. All blood osmolality results (277-295 mOsm/kg) were within the normal range. Urine osmolality ranged from 192 to 1006 mOsm/kg. There was no correlation between the urine/blood osmolality ratio (a marker of dehydration) and the fluid intake in the 12 h before the operation (r=-0.10) or the visual analogue score for thirst (r=0.02). There was no difference in the osmolality ratio between those with or without a dry tongue. Urine specific gravity, as measured by a dipstick, was correlated positively with urine osmolality (r= 0.64, P <0.001) but there was a wide range of osmolality results for each discrete specific gravity value. If the patients are split into two cohorts, hydrated and dehydrated, as determined by urine specific gravity (≤1.015 and ≥1.020), there is a significant difference in urine/blood osmolality ratios between these groups (mean (SD) 1.81 (0.58) vs 2.51 (0.40), P <0.0001).

Conclusions: Symptoms of dehydration and reported oral fluid intake do not reflect the extent of the physiological response to starvation before elective caesarean section. Bedside urine dipstick specific gravity estimation is a reasonable substitute for laboratory urine osmolality when determining if a healthy pregnant woman is dehydrated. The influence of the patient’s hydration status on the cardiovascular response to regional anaesthesia is subject to further investigation.

Reference

P40 Anaesthesia for caesarean section: a retrospective audit

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Introduction: General anaesthesia (GA) for caesarean section (CS) can be associated with maternal mortality and morbidity.1 Successful use of regional anaesthesia (RA) avoids the risks associated with GA. Failed RA can often lead to litigation. The Royal College of Anaesthetists (RCA) guidelines2 propose the following standards for best practice: a) >95% RA for elective (EL) CS, b) >85% RA for emergency (EM) CS, c) RA to GA conversion rate of <1% for elective CS and <3% for emergency CS. We wished to audit the rates and reasons for RA and GA and conversion of RA to GA for ELCS and EMCS in our unit and compare them to the RCA standards for best practice.

Methods: Data were collected for all CS (EL and EM) for 3 years, 2001-2003. The information collected included the ASA grade, urgency of CS, grade of anaesthetist, anaesthetic technique (RA or GA), reason for GA, and the conversions from RA to GA.

Results:

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA rates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ELCS</td>
<td>376/382 (98%)</td>
<td>379/387 (98%)</td>
<td>378/384 (98%)</td>
</tr>
<tr>
<td>EMCS</td>
<td>497/529 (93%)</td>
<td>472/501 (94%)</td>
<td>492/520 (94%)</td>
</tr>
<tr>
<td>Conversion RA to GA</td>
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<tr>
<td>ELCS</td>
<td>376/382 (98%)</td>
<td>379/387 (98%)</td>
<td>378/384 (98%)</td>
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<tr>
<td>EMCS</td>
<td>497/529 (93%)</td>
<td>472/501 (94%)</td>
<td>492/520 (94%)</td>
</tr>
<tr>
<td>Conversion RA to GA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ELCS</td>
<td>0</td>
<td>1/380 (0.26%)</td>
<td>1/379 (0.26%)</td>
</tr>
<tr>
<td>EMCS</td>
<td>15/512 (2.92%)</td>
<td>17/489 (3.47%)</td>
<td>16/508 (3.14%)</td>
</tr>
</tbody>
</table>

*due to PPH; †maternal request

Reasons for conversion to GA were mainly inadequate or failed blocks, technical difficulty, maternal requests and urgency of delivery.

Conclusion: Although the RA rates for EL and EMCS in our unit compared favourably with the RCA targets for three consecutive years, the RA to GA conversion rate for EMCS was higher than the proposed standards for two years. We have taken steps to remedy the avoidable reasons for GA as identified by our audit namely; guidelines for proper block assessment (using touch), doses of local anaesthetic for both epidural top-up CS and intrathecal anaesthesia following inadequate epidural block in labour, better communication about the urgency of delivery and better ante-natal information about the risks of GA.

References
Introduction: The Internet provides a method by which women may obtain information about epidural analgesia for labour. However the quality and reliability of information posted on the Internet cannot be guaranteed. Google is the most popular Internet search engine but 99% of Internet users only access the first five pages of an Internet search. A recent survey of antenatal women found that women did not consider the Internet a useful source of information on labour analgesia. The purpose of this study was to evaluate with a validated assessment tool the quality of patient information websites on epidural analgesia for labour most likely to be found by the public using a simple search term.

Method: Using the search term ‘labour epidural’ with Google UK, all relevant patient information websites on the first five pages were identified. These websites were then evaluated by six health professionals (two midwives, two anaesthetic registrars and two consultant anaesthetists). The DISCERN instrument was used for evaluation. This has a series of questions each with a five-point scale score to rate reliability and quality and give an overall rating for health information.

Results: Twelve websites were identified and evaluated. Five were commercial sites and a further three had commercial sponsorship. Only two websites were rated as at least fair quality by all evaluators. No website was rated as high quality by any of the evaluators.

Conclusion: A different Internet search with other evaluators using an alternative quality assessment tool might have different results. However our study suggests there is a need for more high quality and reliable patient information websites on labour epidural analgesia, which can be located easily by the public.

References
P43 Does body mass index influence temperature rise with labor epidural analgesia?
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Introduction: Labor epidural analgesia (LEA) is believed to increase the patient’s body temperature. We investigated if patients with a body mass index (BMI) >30 kg/m² experience a higher or lower temperature increase than those with a BMI <30.

Methods: We used a quality assurance database to retrieve data. Only patients with vertex presentation, singleton fetus, and uncomplicated pregnancy were used. All patients delivered spontaneously. In addition to demographics, maternal temperature before analgesia (baseline, BL), at 10-cm cervical dilatation and at delivery were recorded. All patients received an epidural infusion of 0.125% bupivacaine with 2 μg/mL of fentanyl at 10 mL/h. Epidural time to delivery interval (ED interval) was noted. Results were expressed as mean (± SD) and analyzed using repeated measures analysis of variance and post-hoc comparisons with Fisher’s LSD test at $P < 0.05$. There were 866 patients with BMI <30 and 266 with BMI >30.

Results: The ED intervals were not significantly different between the groups. Temperature elevations occurred in both groups without any inter-group differences at any of the measurement periods (Fig 1).

Conclusion: Our results show that temperature elevations occur in lighter and heavier patients to an equal degree. The BMI does not seem to make any difference.

Fig 1. Mean tympanic temperature. Vertical bars = SD. *Significantly different from other measurements in the corresponding group.

P44 Management of a parturient with a gunshot wound to the chest: case report
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Introduction: Trauma is one of the leading causes of morbidity and mortality among women of reproductive age.

Case Report: A 24-year-old parturient was admitted conscious to the emergency department complaining of right-sided chest pain. Three puncture wounds were noted below the right nipple, and decreased breath sounds on that right side. X-ray confirmed R hemothorax. A thoracotomy was performed under local anesthesia, the tube being removed after 2 days following resolution on X-ray. An epidural catheter was inserted at L3-4 and morphine plus bupivacaine was given for pain. A cardiotocogram showed a fetal heart rate in the 170s with decreased variability and non-reassuring tracing. A cesarean section was performed under epidural anesthesia with delivery of a 2135-g female with Apgar scores of 2 (1 min) and 8 (5 min). Postoperative analgesia was continued two more days and she and her baby were discharged in a satisfactory clinical state.

Discussion: Non-severe as well as severe injuries have been shown to result in adverse maternal and fetal outcomes. In the trauma obstetric patient there is also the fetus to consider as there is always the possibility that fetal distress is present. Anesthesia for emergency cesarean section in the trauma pregnant patient would depend on the severity of maternal injury, and the urgency of fetal delivery. In the hemodynamically unstable parturient, general anesthesia is the technique of choice as it provides the ideal situation for resuscitation of the mother and rapid delivery of the fetus. In less urgent cases and where the parturient is stable, regional anesthesia may be considered. If an epidural catheter is in situ, even in emergent cases, it allows the rapid institution of anesthesia for cesarean section and thus avoids general anesthesia and the risk of difficult intubation. This patient had an epidural catheter placed by the pain team for management of her injury pain. The epidural catheter was used to provide anesthesia for operative delivery and was also used to provide postoperative analgesia.

Conclusion: Early placement of the epidural catheter for trauma-induced pain was beneficial for pain management but was also provided anesthesia for the C-section. The general dictum that which is best for the mother is what is best for the fetus tends to make the goals clear in this situation.

Reference
P45 Maternal and fetal haemodynamics during spinal anaesthesia for caesarean section using phenylephrine

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Introduction: Several studies have evaluated the effects of spinal anaesthesia on maternal and fetal haemodynamics and fetal acid-base status. Few to date have extensively evaluated these parameters with current optimal management of maternal blood pressure. We have conducted a prospective observational study of maternal and fetal haemodynamics and fetal outcome following single shot spinal anaesthesia using prophylactic phenylephrine infusion to control maternal blood pressure.

Methods: 60 healthy women scheduled to undergo elective caesarean section at 39 weeks gestation were enrolled into the study. In addition to non-invasive maternal blood pressure (BP), maternal cardiac output (CO) and umbilical artery (UA) pulsatility index were measured by Doppler ultrasound at the following time intervals: before anaesthesia and 5, 10, and 15 min after spinal injection. The primary fetal outcome measure was UA blood gases. Spinal anaesthesia was performed in the sitting position with bupivacaine 12.5 mg and diamorphine 300 µg. A prophylactic infusion of phenylephrine was started according to our protocol1 immediately after the spinal injection, and the rate adjusted by the anaesthetist according to subsequent maternal blood pressure recordings. Degree of correlation between measures of maternal haemodynamics and UA pH and base excess were quantified using Pearson’s correlation coefficient.

Results: Mean pre-anaesthetic maternal systolic BP and CO were 121 mmHg and 8.2 L/min respectively and were not significantly altered during the study period. Mean UA pulsatility remained constant throughout the study period and the mean UA pH was 7.30. There was no correlation between measures of maternal haemodynamics and UA pH; however, there was one umbilical arterial sample with a base excess of -9.0 mmol/L and an umbilical arterial pH below 7.2, which was associated with a 5-min period of maternal hypotension.

Conclusions: The mean UA pH was higher than we have found in previous studies using ephedrine as treatment rather than prophyllactic phenylephrine for the management of maternal hypotension.2 However, occasional severe hypotension associated with fetal acidemia still occurs when phenylephrine infusions are used. We did not identify any overall correlation between fetal status as measured by UA blood gases and any measure of maternal haemodynamic status.

References

P46 Combined spinal epidural for caesarean section in a patient with long QT syndrome and an automatic implantable cardiac defibrillator

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Introduction: Long QT syndrome (LQTS) is a congenital arrhythmogenic cardiovascular disorder resulting from mutations in cardiac ion channels, presenting with recurrent syncope and sudden death.1 The reported case describes the successful anaesthetic management of a parturient with LQTS and an automatic implantable cardiac defibrillator (AICD) undergoing caesarean section.

Case Report: A 32-year-old primiparous Caucasian woman with LQTS (QTc = 530 ms) diagnosed following a series of blackouts presented for elective caesarean section at 38 weeks gestation. An AICD had previously been inserted before this pregnancy, which successfully reverted two episodes of VF in the ensuing months. Following infusion of Mg2+ 2 g over 20 min, a combined spinal epidural (CSE) was performed in the right lateral position, with hyperbaric bupivacaine 7.5 mg and diamorphine 300 µg constituting the intrathecal dose. The patient was then immediately placed in the left lateral position until surgical anaesthesia was achieved, at which point the patient was turned into the supine position with left tilt. Supplementation of the block via the epidural catheter was not required. Immediately before surgery the AICD was turned off by a cardiac technician, in order to allow the use of surgical diathermy, and remained off until the operation was completed. Blood pressure and heart rate remained stable throughout the procedure. The patient made an uneventful recovery.

Discussion. The clinical features of LQTS result from the development of torsades de pointes, giving rise to an abrupt decrease in cerebral blood flow leading to syncopal symptoms. Although usually self-terminating, the arrhythmia can deteriorate into ventricular fibrillation and death. AICDs do not prevent the formation of torsades de pointes, but they do reduce the incidence of sudden death. Anaesthetic management should focus on prevention of excessive sympathetic activity and avoidance of factors that can prolong the QT interval, including vasopressor drugs. Sequential CSE allows epidural topping-up as necessary to achieve surgical block, although this manoeuvre proved unnecessary in this case. This patient was also kept in the full lateral position until ready for surgery, to eliminate any reduction in pre-load caused by aorto-caval compression. These two measures resulted in stable anaesthesia, avoiding the need for vasoppressors that could provoke an episode of torsades de pointes.

Reference
Phaeochromocytoma and twin pregnancy

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Introduction: Phaeochromocytoma in pregnancy presents a challenge to obstetricians, anaesthetists and endocrinologists. In this case report we discuss the second trimester diagnosis, the use of α- and β-adrenoreceptor blocking agents and the perioperative management of phaeochromocytoma in a twin pregnancy.

Case Report: A 21-year-old healthy primigravida presented to the antenatal booking clinic at 17 weeks gestation with a blood pressure (BP) of 156/88 mmHg. Elevated 24-h urinary catecholamine levels and an MRI scan that demonstrated the presence of a 7 cm mass within the right adrenal confirmed the diagnosis of phaeochromocytoma. A multidisciplinary team discussion resulted in a plan for elective caesarean section at or around 34 weeks following a period of pharmacological blockade and then early laparoscopic right adrenalectomy. She was admitted at 26 weeks for perioperative monitoring including invasive blood pressure and non-invasive cardiac output monitoring using lithium dilution techniques (LIDCO™). Following an infusion of Mg2+ 2 g and a 1-mg bolus of alfentanil, general anaesthesia was induced. The BP remained stable throughout surgery. Sodium nitroprusside was infused to control hypertension for a short period of time around extubation. Her recovery in the intensive care unit was largely uneventful, with her cardiovascular status greatly improving after delivery. Laparoscopic adrenalectomy was successfully performed 4 weeks post partum.

Discussion: Undiagnosed phaeochromocytoma during pregnancy is associated with a high maternal and fetal mortality.1 Our patient responded poorly to treatment resulting in the loss of one twin. This may be a result of the gravid uterus acting as a mechanical stimulus for tumour catecholamine release, as has previously been described.2 However, tight BP control in the perioperative period resulted in the safe delivery of the second twin.

References