P101 A modified WHO surgical safety checklist for category 1 caesarean sections
A Lahkar, A Cooney, G Massolini
Anaesthetics, Milton Keynes NHS Foundation Trust, Milton Keynes, UK

Introduction: In June 2008, WHO introduced a surgical safety checklist to be used in every operating theatre to improve patients’ safety. In 2010 a WHO surgical safety checklist for maternity was created in response to requests from maternity services and clinicians. Nevertheless, in some emergency situations like category 1 Caesarean sections, this checklist could still be quite a difficult task to achieve due to understandable time limit constrains to safely deliver the baby and/or save the mother’s life.

Whilst there is still no international consensus or any specific recommendation from WHO concerning these specific situations, the Anaesthetic Department in Milton Keynes hospital has managed to devise a checklist for cat 1 LSCS which is 100% compliant both in terms of content with WHO guidelines and adherence by hospital staff.

Method: After considerations and inputs from the Consultant Anaesthetists, a simplified checklist was introduced in our emergency obstetric theatre in June 2013 by way of an ad hoc poster hanged on the wall. It spells out the most 10 salient questions to be read by one of the theatre staff before the start of a category 1 Caesarean section. These questions translate the original 32 WHO ones that were spread across 3 sections in a simpler, quicker format.

Results: After the introduction of the modified WHO checklist in June 2013, compliance is 100%.

Discussion: By putting the combined know-how and experience of many Consultant Anaesthetists to the task, we managed to simplify the original WHO narrative into a sharper tool that is quickly and effectively utilised for a better and safer quality of care in what has become a “normal routine” during extraordinary times in the emergency theatre.

Reference

P102 A parturient with phocomelia and severe needle phobia: the challenges faced
R Sinha, K Howard, N Bhandal
Department of Anaesthesia, Nottingham University Hospitals NHS Trust, Nottingham, UK

Introduction: Parturients with phocomelia are rarely seen and present anaesthetic and obstetric challenges. We present a case of a parturient with phocomelia and severe needle phobia.

Case report: A 33 year old woman with phocomelia and severe needle phobia presented to the obstetric anaesthetic clinic at 20 weeks for pre-assessment.

Her phocomelia was thought to be idiopathic, she had been adopted when young and no family/drug history was available. Examination revealed four limb phocomelia. There were absent upper limb bones on the right and a fused hand attached directly to her body. Her left upper limb was shortened with a primitive hand and fused toes. Her head, neck and torso appeared normal. She was able to mobilize with a wheelchair and significant assistance from her partner. The problems faced in clinic were numerous and focused on her severe needle phobia, difficult venous access and monitoring, positioning, mobilization and thromboprophylaxis as well as the challenges posed by the pregnancy itself. The anaesthetic plan consisted of non-invasive blood pressure monitoring on her left lower extremity; pulse oximetry via an ear probe or toe and standard electrocardiogram. These were tested prior to labour. Due to the impossibility of standard intravenous access and extreme needle phobia several discussions were had about obtaining intravenous access prior to labour. A right subclavian Hickman line was inserted at 39 weeks facilitated by the use of entonox. Regional analgesia was refused for labour so the option of intravenous fentanyl via a midwife controlled analgesia pump was discussed. Should a caesarean section be required a neuroaxial anaesthetic was refused and so a general anaesthetic was planned.

At 40+2 weeks spontaneous rupture of membranes occurred and labour established. However, due to failure to progress a decision was made to perform a caesarean section.

In theatre the challenges related to positioning and achieving a satisfactory left lateral tilt. A rapid sequence induction was conducted following pre-oxygenation to an end-tidal oxygen concentration of 92%. Anaesthesia was induced with thiopentone 350mg and suxamethonium 100mg. Soon after induction she desaturated rapidly to the high 60s. This resolved after tracheal intubation and ventilation. She was hypotensive intra-operatively, with an estimated blood loss of 1300mL. After fluid and blood resuscitation, recovery was unremarkable. Postoperative pain was managed with transversus abdominus plane blocks and morphine patient/midwife controlled analgesia.

Discussion: There is little literature about managing delivery in women with phocomelia, but successful regional techniques have been described although this was refused here. Early discussion of anaesthesia and analgesia options, and plans for vascular access and monitoring are needed. There is a reduced vascular reservoir and skeletal muscle mass.

As a consequence faster inductions, emergences and responses to titrated drugs are observed.
P103 A questionnaire to evaluate and aid future development of the AAGBI’s SAFE obstetric anaesthesia course in Liberia
JCO Fox, CE Richards*, T Sheraton, A Sonah†
†Department of Anaesthetics, Phebe Hospital, Bong County, Liberia.
*Department of Anaesthetics, Royal Gwent Hospital, Newport, UK.
Department of Anaesthetics, University Hospital of Wales, Cardiff, UK

Introduction: Dr Kate Grady has developed this three-day refresher course in obstetric anaesthesia on behalf of the AAGBI. The course is aimed at non-physician anaesthetists in developing countries. It consists of short lectures, interactive sessions and workshops that focus on the recognition and management of leading causes of maternal death in resource poor settings. The course has been taught in Uganda, Bangladesh, Liberia and Ghana. It includes the principles of the WHO Safe Surgery and training of trainers. Mothers of Africa, a medical educational charity, has led delivery of 2 courses for nurse anaesthetists (NAs) in Liberia - supported by the AAGBI IRC. Liberia has approximately 60 nurse anaesthetists and no medically qualified anaesthetists for a population of 4.2 million people. Access to CPD is difficult. The MMR in Liberia is 770 per 100,000 live births. In order to plan future development of the course in Liberia, which will be led by Liberian trainers, feedback data was collected.

Methods: A follow up questionnaire was given to 35 NAs who had previously attended a SAFE obstetric anaesthesia course held in Liberia (March 2012 or March 2013). We aimed to assess: 1) the quality, usefulness and appropriateness of the material taught during the course, 2) the effect on motivation to improve local services/care delivery, 3) the effect on the confidence levels of NAs in managing obstetric anaesthetic emergencies.

Results: A 70% follow up rate was achieved. 97% reported positive changes in their attitude to work and their clinical practice and 94% reported improvements in interactions with colleagues. Many NAs gave details of cases where the skills and knowledge they learnt on the course helped save lives and improve clinical outcomes. 11 NAs requested continued education and training. Other suggestions for course improvement included: additional sessions in preoperative assessment and TAP blocks, and the inclusion of midwives in the training sessions. The following table illustrates the mean subjective confidence scores (between 0 and 10) of the NAs in various clinical scenarios before and after the course.

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>General anaesthesia LSCS</td>
<td>6.3</td>
<td>9.2</td>
</tr>
<tr>
<td>Spinal anaesthesia LSCS</td>
<td>7.6</td>
<td>9.8</td>
</tr>
<tr>
<td>Management of severe eclampsia/pre eclampsia</td>
<td>5.7</td>
<td>9.2</td>
</tr>
<tr>
<td>Management of obstetric haemorrhage</td>
<td>5.9</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Discussion: Our results indicate that the SAFE obstetric anaesthesia course in Liberia has been well received with subjective evidence of empowerment and improved methods of working. This is promising in the context of increasing the reach of future courses and enabling local faculty to lead training. Further data from logbooks provided as part of the course were not obtained and more work is needed to encourage completion of the logbooks. Objective evidence is required to demonstrate impact on patient outcomes.

Reference

P104 A retrospective descriptive analysis of anaesthesia for successful cervical cerclage in pregnancy
J Modha, G Bural*, F Forya*, CP James*, AL David*, J Dick, L Wee
Department of Anaesthesia, University College London Hospitals NHS Foundation, London, UK.
*Department of Obstetrics, University College London Hospitals NHS Foundation, London, UK

Introduction: Cervical cerclage is a common operation which requires an anaesthetic. There are no studies on the type of anaesthesia used for this procedure. Aim: To determine the type of anaesthesia used for vaginal cervical cerclage.

Method: Ethical approval waived. Women having any vaginal cervical cerclage (Macdonald or Shiridkars) during pregnancy between January 2005 and December 2012 were identified using the hospital obstetric anaesthesia database and cross-referenced with data from the Preterm Birth clinic where women at risk of preterm birth are seen antenatally. Data was obtained by examination of obstetric case notes and the ultrasond scan records and analysis conducted using Microsoft Excel.

Results: There were 190 cases. Twenty-five patients were excluded due to incomplete data, hence 165 included in analysis. The mean gestational age was 16.6 weeks (range 9-23.6 weeks). The table below shows that both general anaesthesia (GA) and regional anaesthesia (RA) were used. The majority of regional anaesthetics were spinals (95.7%), the rest combined spinal and epidural (CSE) (3.6%) and epidural top up (0.7%).

<table>
<thead>
<tr>
<th></th>
<th>GA n (%)</th>
<th>RA n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total n=165</td>
<td>26 (16%)</td>
<td>139 (84%)</td>
</tr>
<tr>
<td>Spinal n=133</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSE n=5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epidural n=1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Five patients who had a spinal anaesthetic required second procedures (3 GA, 1 spinal, 1 CSE). Of those converted to GA, one patient had a block to T6 (the reason for conversion to GA was not documented), one patient had a block to T12 and the third patient had 3 failed spinal attempts. In all cases there were no major anaesthetic complications and cervical cerclage was placed successfully.

Discussion: In this series, the majority of vaginal cervical cerclage surgery was performed safely and effectively under RA. There are no specific guidelines regarding the type of anaesthesia for cervical cerclage. Anaesthetic considerations favouring a regional anaesthetic in pregnancy include the risk of aspiration and difficult airway management in patients over 20 weeks gestation and those under 20 weeks gestation if at high risk for example those with a high BMI. The majority of women in our data set were less than 20 weeks (88.5%). Other considerations include patient and surgeon choice. Women in this series were given the option of GA or RA. In certain cases for example rescue and abdominal cerclages, the patient may need to be in a deep Trendelenberg position to aid reduction of membrane prolapse to avoid membrane rupture or to aid access to the pelvis.

References
P105 A retrospective descriptive analysis of dose of intrathecal anaesthesia and adjuncts for successful cervical cerclage in pregnancy
J Modha, G Burul*, F Forya*, CP James*, AL David*, J Dick, L Wee
Department of Anaesthesia, University College London Hospitals NHS Foundation, London, UK. *Department of Obstetrics, University College London Hospitals NHS Foundation, London, UK

Introduction: Cervical cerclage is a common operation, which requires either a general or regional anaesthetic aiming for a block height of T10. There are no studies determining the dose that should be used to achieve this or describing additional drugs used for successful surgery.

Aim: To determine the dose of local anaesthesia used for intrathecal injection and the block height achieved in women undergoing cervical cerclage. In addition to determine the use and dose of adjuncts.

Method: Ethical approval waived. Women having vaginal cervical cerclage during pregnancy between January 2005 and December 2012 were identified using the hospital obstetric anaesthesia database and cross-referenced with data from the Preterm Birth clinic. Data was obtained by examination of obstetric case notes and the ultrasound scan records and analysis conducted using Microsoft Excel.

Results: In all cases, cervical cerclage was achieved successfully. There were 138 cases of intrathecal anaesthesia (133 spinal and 5 combined spinal epidurals) in whom 67.4% (93/138) had documented intrathecal anaesthetic dose and were included for final analysis. Hyperbaric bupivacaine 0.5% was used (mean dose 10.9mg, median 10.8mg and mode 10mg, range 6.5–15mg). Block height and dose of intrathecal anaesthetic was documented in 54/93 cases (58%). The block height ranged from T2 to T12 with similar doses of local anaesthetic given in each group and of similar gestation and body mass index (BMI).

Block height T2-4 T5-8 T10 T12
Frequency 7 31 13 3
Mean dose mg hyperbaric bupivacaine 0.5% 11 11 11 8
Mean gestation (weeks) 17.4 17.7 15.6 19.1
Mean BMI kg/m² 27.3 26.6 26.1 32

In 3 patients that had block height of T12 only one was converted to GA. Opiates were used in 73/93 (78.5%), the most frequent being fentanyl.

Vasopressors were used in 26 cases (23 phenylephrine, 3 ephedrine). Other drugs included 3 cases of intravenous midazolam, 1 case propofol and in 1 case salbutamol (as a tocolytic agent).

Discussion: In our case series there is a wide dose range of both hyperbaric bupivacaine 0.5% and opiate given. To achieve a block height of T10 or above a minimum dose of 11mg (2.2ml) is recommended which may be independent of other factors. There is a wide variation in block height but even a low block (T12) was found to be adequate.

References
P107 A year in the "maternity" life of an increasingly busy new build district general teaching hospital - coping with training and service provision - 2013

H Wrigley, PF Yoxall, Janet Slee
Anaesthetics, St Helens & Knowsley NHS Trust, Liverpool, UK

Introduction: Since moving to a new PFI built hospital in 2010 our maternity unit has become more busy. Delivery rates/year have increased from 2900 to 3700 pa (up 27.6% in 3 years) increasing demands upon anaesthetic services.

Methods: We reviewed all our maternity cases during 2013, both epidural and caesarean sections. We also surveyed our CT2 trainees to assess their experience in terms of case numbers during a newly introduced modular training block. Lastly consultant cover on labour ward was audited for CNST purposes.

Results

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Deliveries</td>
<td>3700</td>
<td>22.6</td>
</tr>
<tr>
<td>LSCS</td>
<td>838</td>
<td>12.5</td>
</tr>
<tr>
<td>Grade I-III LSCS</td>
<td>464</td>
<td>10.1</td>
</tr>
<tr>
<td>Grade IV LSCS</td>
<td>374</td>
<td>79.5</td>
</tr>
<tr>
<td>LSCS - SAB</td>
<td>666</td>
<td>14.7</td>
</tr>
<tr>
<td>LSCS - Epidural</td>
<td>123</td>
<td>14.2</td>
</tr>
<tr>
<td>LSCS - CSE</td>
<td>14</td>
<td>4.2</td>
</tr>
<tr>
<td>LSCS - GA</td>
<td>119</td>
<td>4.2</td>
</tr>
<tr>
<td>RA to GA</td>
<td>34</td>
<td>4.2</td>
</tr>
<tr>
<td>Average BMI LSCS (Range)</td>
<td>28.3</td>
<td>(16.7-59.9)</td>
</tr>
<tr>
<td>Epidurals</td>
<td>895</td>
<td>24.2</td>
</tr>
<tr>
<td>Epidural Resites</td>
<td>32</td>
<td>3.7</td>
</tr>
<tr>
<td>PDPH - Epidural</td>
<td>15</td>
<td>1.7</td>
</tr>
<tr>
<td>PDPH - SAB</td>
<td>2</td>
<td>0.3</td>
</tr>
<tr>
<td>Epidural Blood Patches</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Average BMI Epidural (Range)</td>
<td>27.1</td>
<td>(16-62.8)</td>
</tr>
</tbody>
</table>

CT2 Training One of our requirements is to teach at least 4 CT2s per annum obstetric basic competencies. Our trainees receive a 4 week long daytime block covered by an anaesthetic ST3-7 and a consultant. They attend 40 sessions, the majority sitting >15 epidurals and anaesthetics >30 caesarean sections before embarking on daytime on calls. They attend our in-house MODS (Obstetric Simulation Day) run by one of our Consultant Obstetricians.

Consultant Input The number of funded Consultant labour ward sessions has risen 7 to 10 sessions (7 elective lists per week). A “High Risk Obstetric clinic” runs weekly to pre-assess all potentially difficult patients (250-300 per annum).

Discussion: Despite a significant increase in workload we have managed to maintain levels of cover (both junior and consultant) whilst allowing for CT2 training in obstetric basic competencies as required at both national and local levels. This has been achieved by increasing our core of obstetric consultant anaesthetists, increasing obstetric PAs and changing to a modular CT2 training programme.

P108 Abstracts on the antenatal anaesthetic clinic presented to the Obstetric Anaesthetists’ Association, 1991-2013

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anAesthetic department, St Mary’s Hospital, London, UK,
*Aesthetic department, Chelsea & Westminster Hospital, London, UK

Introduction: National reports1 and guidelines2 recommend assessment of women with ‘high-risk’ pregnancies and potentially serious co-morbid disease in an antenatal anaesthetic clinic (AAC). We reviewed trends and themes in abstracts on this topic presented to the OAA.

Methods: Full-text records of abstracts (excluding case reports) presented at OAA meetings (1991-2013; see www.oaa-anaes.ac.uk) were searched using the terms ‘antenatal’, ‘clinic’, ‘risk’ and ‘refer’. Relevant abstracts were reviewed for themes and conclusions.

Results: Forty abstracts were presented at 14 Annual Meetings (Fig. 1); 3 were unavailable in full-text (2008) but 1 was provided by the author on request. 35 were from single departments and 5 were surveys (4 national). Common topics were obesity (12, 30%), referral reason (7, 18%) and appropriateness (4, 10%), and outcomes (5, 13%). Nine (23%) described single patient cohorts, e.g. cardiac. AAC workload has increased from 2.3 to 28.6 patients per month over 22 years, albeit at different centres. Obesity has replaced musculoskeletal disease as the most frequent reason for referral. Common concluding themes include the need to improve the timeliness and appropriateness of referrals, and ensuring anaesthetic plans are both prominent and followed.

Figure 1: number of abstracts on the AAC presented per year

Discussion: Abstracts relating to AACs have become more frequent in the last decade, presumably reflecting their increasing provision and perceived usefulness (and recommendation in the 2002-04 CEMACH report3). Increased demand for this service is exacerbated by inappropriate referrals and budgetary constraints. Referral processes, facilities, and documentation and inconsistent use of plans are areas for development. Future work should focus on quality improvement and assessment of cost-effectiveness. Nationally agreed referral criteria and a national ‘anaesthetic plan’ document, complemented by referrer education, may enhance the process. Multidisciplinary ‘one-stop-shop’ or midwifery led clinics for common problems, such as obesity, may be beneficial.

References

P109 Accuracy of a new electronic obstetric anaesthetic database
Rohit Rohit, R Abraham, GNB Jackson
Anaesthetic department, Royal Berkshire Hospital, Reading, UK

Introduction: We have introduced a new electronic database ‘ROAD’ (Reading Obstetric Anaesthetic Database) to record obstetric anaesthetic data. Written & designed by one of our anaesthetists it is secure, password protected & able to produce reports on patient data & the activity of individual anaesthetists. More than 70% obstetric anaesthetic units use electronic data collection system in the UK but there is little agreement as to the best format.1 We audited the accuracy of data entry, as a marker of ease of use by the anaesthetists, before auditing the content of the database.

Methods: This was a retrospective audit, analysing data for one month period (June 2013). The data in ‘ROAD’ was compared to 1) our handwritten anaesthetic record book (ARB); 2) Midwifery led labour ward logbook (LWLB); 3) Operating theatre electronic log ‘Bluespier’. Data entered on the ‘ROAD’ was manually checked against all these three sources and the results tabulated and analysed.

Results: 253 records were found in the ARB. The ARB missed one case (found in Bluespier), Bluespier missed one case (found in the ARB) and LWLB missed 6 cases (found in the ARB & Bluespier). The results show that ‘ROAD’ was 96% accurate compared to any of the other systems.

<table>
<thead>
<tr>
<th>No. of cases missing on 'ROAD' compared to others</th>
<th>Total 'ROAD' accuracy against other data sources as %</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARB 10</td>
<td>253  96.047%</td>
</tr>
<tr>
<td>Bluespier 7</td>
<td>174  95.977%</td>
</tr>
<tr>
<td>LWLB 10</td>
<td>247  95.951%</td>
</tr>
<tr>
<td>'ROAD'</td>
<td>243  (100%)</td>
</tr>
</tbody>
</table>

Discussion: Pinder et al considered an accuracy of 89% for their electronic record adequate enough to adopt computer based data collection system.2 We used three different methods of data collection already in regular use, to compare with our electronic database and showed it to have a high degree of accuracy. This suggests that the database is easy to use and consistently completed by our anaesthetists. We wish to use our database to produce reports on anaesthetic service provision (including the quality & safety of that service) as well as for auditing individual anaesthetist activity (particularly our novice obstetric anaesthetists to ensure appropriate case mix & experience during their obstetric attachments). Before using any database to audit these aspects it is important to ensure that the data being audited is a true reflection of anaesthetic activity, we believe our new database is sufficiently accurate to audit the data within it. The limitation of our audit is that we only audited the data from one month but we believe that the data entry practice of all months is similar. We conclude that our electronic database is accurate & the data entered can be used to audit our obstetric anaesthetic service.

References

P110 Accuracy of landmark approach to central neuraxial blocks in obstetric patients
J Lee, K Bhatia, A Venkataraju, P Kochhar
Anaesthesia, St Mary’s Hospital, Manchester, UK

Introduction: Correct identification of vertebral level could prevent damage to the spinal cord during a central neuraxial block (CNB). Evidence suggests that ultrasound (US) imaging of the spine by an experienced operator leads to correct identification of vertebral level in >90% of the patients and decrease the number of attempts required for a successful CNB.1 National Institute for Health and Care Excellence suggests US could be a useful tool for epidural catheter insertion.2 Our aim was to determine the discrepancy between landmark technique and US to identify level of insertion of CNB.

Methods: Two experienced US operators who were blinded to the initial procedure retrospectively performed US imaging of spine post-operatively after elective caesarean section in 51 obstetric patients with their consent from January to March 2013 in St Mary’s Hospital. All the patients had a lumbar CNB done by landmark approach. The documented vertebral level at which CNB was performed was noted. This was then compared with the actual vertebral level identified by bedside US imaging of spine.

Results: 29 patients had a spinal, 20 had an epidural and two had combined spinal-epidural anaesthesia. The median body mass index (BMI) was 28.6kg/m². Landmark technique was only accurate in 39.2% of patients. There was no statistically significant correlation between the experience of operator and accuracy. 3% of patients had a CNB at the level of L₁ or above. Documentation of the level performed was excellent. Raised BMI and difficulty in palpation of landmarks resulted in statistically significant decrease in the accuracy (p<0.05 Fisher’s Exact Test).

Discussion: Our findings co-relate well with other studies which have found that the vertebral level identified by landmark approach was at least 1 interspace higher than the level located by US in >40% of the pregnant population.3 Our audit further confirms that the use of traditional landmark technique is highly inaccurate with potential increase risk of needle injury to the spinal cord especially in the high-risk patient groups (morbid obesity and musculoskeletal problems). We propose that all elective obstetric patients, patients having a lumbar epidural, and high risk patients having a lumbar CNB should have US imaging of the of their spines to identify the correct vertebral level and other relevant anatomy. The main reasons being that US imaging does not involve any radiation, is compact, portable and readily available at the point of care. Better US equipment availability, staff awareness with appropriate training and improved documentation would aid in providing safer patient care.

References
Adherence to antenatal anaesthetic advice in labouring morbidly obese parturients

S Halliday, LC Robertson, HM du Plessis
Anaesthesia, Princess Royal Maternity Hospital, Glasgow, UK

Introduction: Morbidly obese parturients pose a high anaesthetic risk. Antenatal anaesthetic assessment for women with a body mass index (BMI) ≥40 kg m⁻² at booking is advised. Early establishment of epidural analgesia is often advocated. We sought to determine if this advice is adhered to in our centre.

Methods: A retrospective case note review of 49 morbidly obese patients (BMI ≥40) assessed antenatally was conducted. As a control, data from 23 patients with a BMI <40 who had a labour epidural was collected. We compared the timing of epidural request from labour ward admission, cervical dilation and syntocinon administration at request and the time from epidural insertion to delivery. Mode of delivery was also noted.

Results: Mean BMI for the control group was 23.6 (range 17-32) and for the morbidly obese group 44.6 (40-60). Eleven morbidly obese parturients had an elective caesarean section (CS). Nineteen of the remaining morbidly obese parturients requested labour epidurals. Two parturients delivered prior to insertion.

<table>
<thead>
<tr>
<th>Time to request epidural (range)</th>
<th>Cervical dilation (range)</th>
<th>Syntocinon administration n (%)</th>
<th>Insertion to delivery (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI &lt;40 (n=23)</td>
<td>Yes 12 (52.2)</td>
<td>3.7 (1-7)</td>
<td>375 (110-915)</td>
</tr>
<tr>
<td>BMI ≥40 (n=19)</td>
<td>Yes 13 (68.4)</td>
<td>3.65 (2-8)</td>
<td>334 (12-702)</td>
</tr>
</tbody>
</table>

Table: Timing of epidural request, cervical dilation and syntocinon use at request, and time from insertion to delivery.

In the control group with a BMI <40 that had a labour epidural (n=23), the number of spontaneous vaginal deliveries (SVD), trial of forces (TOF) and lower uterine segment CS (LUSCS) were 13 (56.5%), 5 (21.7%), and 5 (21.7%), respectively. For those with a BMI ≥40 with an epidural (n=17) there were 6 (35.3%) SVD, 3 (17.7%) TOF and 8 (47.1%) LUSCS. The number of SVD in the BMI ≥40 without an epidural group was 18 (85.7%) and there were no TOF and 3 (14.3%) LUSCS.

Discussion: Despite antenatal review, the time to epidural request was longer in the morbidly obese group, indicating a need for ongoing education. The time between epidural insertion and delivery was shorter in the morbidly obese group which had a significantly increased chance of CS, signifying the importance of establishing a working epidural early in this cohort.

References

An evaluation of standards of informed consent and operative fetal resuscitation

M Bailey, A Wolmarans, S Rhodes
Pain Management Unit, St Mary’s Hospital, Manchester, UK

Introduction: Patient satisfaction levels are decreasing with the increased rate of caesarean section deliveries. Maternal satisfaction with the procedure is directly related to the ability to consent. A prospective audit was performed of all obstetric anaesthetic cases in a London teaching district hospital over a period of 12 months. The study aimed to identify the preoperative information that patients were provided with.

Methods: A prospective audit was performed in a tertiary maternity hospital over a 12 month period. A total of 135 cases were audited, of which 38% were elective caesarean sections and 62% were emergency caesarean sections. The patients were questioned about the amount of information that was given to them regarding the procedure and the side effect of general anaesthesia. The data was collected using a proforma.

Results: The results showed that 72% of the patients were satisfied with the information that was provided to them. However, 28% of the patients were dissatisfied with the amount of information that was provided to them. The results also showed that 41% of the patients were not informed about the possibility of a caesarean section during their antenatal appointment.

Discussion: The results showed that the majority of the patients were satisfied with the amount of information that was provided to them. However, there is still scope for improvement in the provision of patient information. Further research is required to identify the factors that influence patient satisfaction levels.

References
P113 An evaluation of fasting times for elective caesarean section surgery

J Ghoshdastidar, KM Sherratt, M Sereviratne*, A McGlennan
Anaesthetics, Royal Free Hospital, London, UK,
*Anaesthetics, University College Hospital, London, UK

Introduction: Enhanced Recovery Programmes have shown increasing evidence for the benefits of reducing fasting times for those undergoing elective surgery. Many of these benefits could be applicable to the elective caesarean section patient. We evaluated the fasting times of our elective caesarean section patients to assess whether we could make improvements to patient care.

Methods: The evaluation included all patients undergoing elective caesarean section surgery at the Royal Free Hospital over a 3-month period. Patients received standard instructions to stop eating at midnight on the day of surgery and to stop drinking clear fluids at 6 am. Data was collected by anaesthetic staff using a standardized data collection sheet. Patients were questioned about the time they last consumed solid food and when they last drank liquid.

Results: In total 77 patients underwent elective caesarean sections during the period of evaluation. We obtained data from 71 patients for fasting times for fluids and 72 patients for fasting times for solids.

<table>
<thead>
<tr>
<th>Pre-op fasting times FLUIDS (hr)</th>
<th>% of patients (n=71)</th>
<th>Pre-op fasting times SOLIDS (hr)</th>
<th>% of patients (n=72)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 4</td>
<td>5.6</td>
<td>6 - 12</td>
<td>15.3</td>
</tr>
<tr>
<td>4 - 6</td>
<td>15.5</td>
<td>12 - 18</td>
<td>66.7</td>
</tr>
<tr>
<td>6 - 8</td>
<td>14.1</td>
<td>18 - 24</td>
<td>16.7</td>
</tr>
<tr>
<td>8 - 10</td>
<td>8.5</td>
<td>over 24</td>
<td>1.4</td>
</tr>
<tr>
<td>over 10</td>
<td></td>
<td></td>
<td>56.3</td>
</tr>
</tbody>
</table>

Discussion: There are no fasting recommendations specific to elective caesarean sections but the standard surgical guidelines of 6 hours for solids and 2 hours for clear fluids are usually applied. Periods longer than 12 hours without fluid have correlated with significant dehydration in patients having elective caesarean sections. There is some evidence to suggest that gastric fluid volume is increased with prolonged starvation in the pregnant patient. Over fifty per cent of our patients went without fluids for longer than ten hours prior to surgery, and almost eighty-five per cent of patients went without food for greater than 12 hours. Our results show that there is a need to introduce methods to reduce fasting times. These could include preoperative letters with individualized times to stop eating and drinking. Also patients lower down the surgical list could be actively encouraged to consume clear fluids, or even carbohydrate drinks as used in many Enhanced Recovery programmes.

References

P114 An evaluation of intrathecal diamorphine versus fentanyl for lower segment Caesarean section in a medium-sized district general hospital

K Ramm, LT Fenton-May, S Naresh
Department of Anaesthesia, Good Hope Hospital, Heart of England Trust, Birmingham, UK

Introduction: Intrathecal diamorphine is now recommended by the National Institute for Health and Clinical Excellence (NICE) as the opioid of choice for lower segment Caesarean section as it provides improved post-operative pain relief. However, it is also associated with a dose-dependent increase in the incidence of pruritus and nausea which may be more significant with diamorphine given its longer duration of action. Having arranged appropriate protocols for postoperative monitoring of women receiving intrathecal diamorphine, we introduced the therapy in late 2012.

Methods: The evaluation took place over a six-week period. A small number of women were still receiving intrathecal fentanyl due to clinician choice, and these provided a useful comparator. Women who were still present in the hospital on a follow-up round on the first day post-op were asked questions about post-operative pain, nausea and pruritus. We also assessed total oral morphine and codeine doses and time to first dose.

Results: Basic data is presented in the chart.

<table>
<thead>
<tr>
<th></th>
<th>Fentanyl</th>
<th>Diamorphine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>15</td>
<td>36</td>
</tr>
<tr>
<td>Time to first morphine (hrs)</td>
<td>5.29</td>
<td>8.9</td>
</tr>
<tr>
<td>Mean morphine dose (mg)</td>
<td>65.4</td>
<td>30</td>
</tr>
<tr>
<td>No morphine required</td>
<td>1 (6.6%)</td>
<td>11 (30.6%)</td>
</tr>
<tr>
<td>Mean codeine dose (mg)</td>
<td>123</td>
<td>119</td>
</tr>
<tr>
<td>Time to mobilisation (hrs)</td>
<td>21.17</td>
<td>15.21</td>
</tr>
<tr>
<td>Time to catheter removal (hrs)</td>
<td>20.3</td>
<td>16.6</td>
</tr>
<tr>
<td>Pruritus requiring treatment</td>
<td>8 (53.3%)</td>
<td>24 (66.7%)</td>
</tr>
<tr>
<td>Nausea requiring treatment</td>
<td>0 (0%)</td>
<td>8 (22.2%)</td>
</tr>
<tr>
<td>Total oral morphine dose (mg)</td>
<td>5 (33%)</td>
<td>13 (36.1%)</td>
</tr>
<tr>
<td>Total codeine dose (mg)</td>
<td>3 (20%)</td>
<td>7 (19.4%)</td>
</tr>
</tbody>
</table>

Discussion: Our results replicate previous work demonstrating a reduction in immediate post-operative analgesia requirements following a switch from fentanyl to diamorphine, but an associated increase in side effects requiring intervention. There was also a reduction in times to first mobilisation and catheter removal, which is worth closer inspection. It is likely to be multi-factorial: the patients having superior analgesia and feeling ready to move sooner, but also the proforma for the ward indicating the patient had received diamorphine. This required the anaesthetist to specify a time after which she would be ready to mobilise, which might have improved motivation amongst the midwives and mothers to achieve mobilisation.

References
1. NICE clinical guideline 132: Caesarean section
**P115 An evaluation of obstetric critical care admissions in a district general hospital**

VL Williams, M Greene, D Saul

*Department of Anaesthesia, Leighton Hospital, Crewe, Cheshire, UK*

**Introduction:** CMACE has provided doctors with excellent data over the past 50 years about maternal mortality, but unfortunately no data about maternal morbidity. In December 2013, the Intensive Care National Audit & Research Centre (ICNARC) produced a second report that analysed critical care admissions of women who were pregnant or recently pregnant in 2009-2012 inclusive. A comparison was made between the hospital ICNARC data and the national ICNARC data.

**Methods:** Data were collected from the hospitals ICNARC database over a four year period from 2009 to 2012. The data was analysed from the categories in the table below.

**Results:** Data from 388 patients were evaluated.

<table>
<thead>
<tr>
<th>Hospital ICNARC</th>
<th>Total no. of patients admitted, female 16-50 years</th>
<th>Currently pregnant</th>
<th>Recently pregnant</th>
<th>Obstetric reason for admission - currently pregnant</th>
<th>Non-obstetric reason for admission - currently pregnant</th>
<th>Obstetric reason for admission - recently pregnant</th>
<th>Non-obstetric reason for admission - recently pregnant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>388</td>
<td>55,791</td>
<td>3.6%</td>
<td>9.3%</td>
<td>0%</td>
<td>100%</td>
<td>50%</td>
</tr>
</tbody>
</table>

**Discussion:** The proportions of patients admitted to the critical care area were comparable with the ICNARC report. The leading indication for admission in the currently pregnant group was for sepsis. This corresponds with the ICNARC report and most recent CMACE report in which sepsis was the leading direct cause of maternal death. The leading obstetric cause for currently pregnant admissions nationally, was for pre-eclampsia. However, there were no admissions in this category at the hospital. This is most likely because pre-eclampsia is diagnosed and treated effectively on the labour ward and rarely needs input from critical care.

In the recently pregnant group, there were equal proportions of patients admitted for obstetric and non-obstetric reasons, this is quite different from the ICNARC report. The leading indication for admission of recently pregnant patients in the ICNARC report was for post partum haemorrhage, by a long way. When looking at the hospital database, it showed that in the period 2010-12, only 3 of 42 patients with a significant post partum haemorrhage of 2.5 litres or more were admitted to critical care. Therefore the question needs to be asked as to whether these patients should have been admitted to the critical care area? The hospital does not have an obstetric HDU, but in hospitals that do have an obstetric HDU facility, these patients would certainly have been admitted there, had closer monitoring and possibly goal directed therapy. All of these patients survived, but could admission to critical care have improved patient outcomes or reduced hospital stay?

**References**

1. Female admissions to adult, general critical care units in England, Wales and Northern Ireland reported as 'currently pregnant' or 'recently pregnant'. [http://www.icnarc.org/documents/Obstetric%20Admissions%200%20Obstetric%20Care%202009%2012.pdf](http://www.icnarc.org/documents/Obstetric%20Admissions%200%20Obstetric%20Care%202009%2012.pdf)
2. The eighth report on confidential enquiries into maternal deaths in the United Kingdom. BJOG 2011, 118(Suppl 2):1-203

**P116 An evaluation of standards of informed consent and documentation for labour epidural analgesia**

S Chaudhari, N Smith, P Prasad

*Anaesthetic Department, George Eliot Hospital, Nuneaton, Nuneaton, UK*

**Introduction:** It is both medico legally and ethically important that the patient is made aware of the nature and risks associated with a labour epidural. No national standardised information card for informed consent is available, although the OAA does publish an epidural information card with specific risks and incidence rates. At our hospital, the documentation is made on part of the epidural chart as an open entry. Our study looked to ascertain whether appropriate details of the epidural and informed consent were made. This was with a view to find whether a total redesign of the epidural chart (at a level of standard suggested by the OAA website) was needed to improve our practice.

**Methods:** We evaluated a total of 100 completed epidural charts over a 4-month period in mid-2012 at our obstetric unit. The epidural notes were retrospectively analysed on our scanned patient electronic notes. Documentation was analysed for: details of the patient, anaesthetist and patient assessment, explanation of the risks and incidence given, details of the epidural technique and post epidural management. Our main focus was on standards of consent.

**Results:**

<table>
<thead>
<tr>
<th>Risk discussed</th>
<th>% of patients informed (n=100)</th>
<th>Rate of risk documented (no. in total)</th>
<th>Range of risk discussed (no. in total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td>69</td>
<td>25</td>
<td>1 in 100:13, 1 in 200:8</td>
</tr>
<tr>
<td>Hypotension</td>
<td>45</td>
<td>4</td>
<td>1 in 8:2, 1 in 4000:2</td>
</tr>
<tr>
<td>Failure</td>
<td>59</td>
<td>4</td>
<td>1 in 13:21, 1 in 10:8</td>
</tr>
<tr>
<td>Itching</td>
<td>14</td>
<td>1</td>
<td>1 in 15:1, 1 in 19:1</td>
</tr>
<tr>
<td>Infection</td>
<td>37</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Motor block</td>
<td>28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urinary</td>
<td>28</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The other areas of documentation studied showed an acceptable standard.

**Discussion:** Several studies have looked at standards of informed consent in UK practice and which risks and incidences were discussed and the range of risk quoted. Our study showed rates generally to be slightly lower than that quoted in these studies. This is likely due to limited space and open entry nature of our current chart. The OAA has set guidelines and advice for both epidural charts and risks and incidence. Following this evaluation, a full redesign of our epidural charts with prompts and guidance of risks and incidence is warranted. In addition, the OAA had overwhelming support for a national standardised information card that could be implemented.

**References**

1. OAA epidural information card: [http://www.oaa-anaes.ac.uk/content.asp?ContentID=185](http://www.oaa-anaes.ac.uk/content.asp?ContentID=185)
2. OAA epidural charts: [http://www.oaa-anaes.ac.uk/content.asp?ContentID=522](http://www.oaa-anaes.ac.uk/content.asp?ContentID=522)
P117 An unusual cause of post-partum sepsis
F A Corcoran, C Brennan, A J Downs
Anaesthetics, Dudley Group NHS Foundation Trust, Dudley, UK

Introduction: Leiomyomomas are common in women of reproductive age and have been linked to spontaneous abortion, retention of the placenta and post-partum haemorrhage.1 It is however rare for them to be the primary cause of post-partum sepsis. We describe the case of a post partum patient presenting with painful fibroids and sepsis.

Case report: A 37 year old woman (P1), 5 days post partum presented with a history of fever, abdominal pain and distention. She had a past medical history of fibroids but there had been no problems during pregnancy. She had an uneventful labour with a normal vaginal delivery. On initial assessment she was apyrexial with normal observations. She had mild tenderness on palpation of her abdomen. She was on regular analgesics and had been commenced on oral antibiotics by her GP. An ultrasound scan (US) was booked to investigate the abdominal pain. Within 4 hours she had deteriorated and developed a pyrexia, tachycardia, tachypnoea and decreased oxygen saturations. Initial impression was sepsis secondary to retained products so blood cultures and swabs were taken and intravenous antibiotics, oxygen and fluid resuscitation commenced. She was transferred to the Maternity High Dependency Unit. CRP was elevated but lactate was normal. She improved over 6 hours but deteriorated again. Antibiotic coverage was amended following microbiology advice but she continued to have a swinging pyrexia. USS detailed a bulky uterus with a large fibroid at the fundus and no retained products. 36 hours after admission she developed peritonitis and a CT abdomen which suggested findings of a pedunculated fibroid measuring 17.5cm that might have twisted on its pedicle. She had an emergency laparotomy which revealed a degenerative, necrotic, infected fibroid. She required ionotrope support and was difficult to ventilate intra-operatively. Post-operatively she was transferred to intensive care where she was sedated and ventilated overnight. She was successfully extubated the following morning and continued with intravenous antibiotics and analgesia. She made a full recovery. Histology confirmed the fibroid had extensive areas of coagulative necrosis, hyalinisation and inflammation. All microbiological investigations were negative.

Discussion: Sepsis in pregnant and post-partum women remains a significant cause of maternal morbidity and mortality.2 Sepsis is a clinical diagnosis and microbiological investigations may be negative. Early recognition, timely diagnosis and active treatment assists an optimum outcome. Fibroids are common in pregnancy but sepsis secondary to infected, necrotic fibroid tissue post-partum is very rare. To our knowledge there have been no reported cases of this. It is therefore essential to consider this in the differential causes of obstetric sepsis when reviewing pregnant women with a history of fibroids.

References

P118 Anaesthetic management of a parturient with severe systemic scleroderma
P Thomas, A Varvinisky, M Human
Anaesthetics, South Devon Healthcare NHS Foundation Trust, Torquay, UK

Introduction: Scleroderma is a chronic systemic autoimmune disease. Successful pregnancy in patients with severe systemic scleroderma is very rare. We report the anaesthetic management of such a case in a patient with a difficult airway, severe pulmonary dysfunction and oesophageal dysmotility.

Case report: A 29 year old woman (G1P0) with severe systemic scleroderma presented to the hospital at 36 weeks gestation with dyspnoea and tachypnoea. Prior to pregnancy her exercise tolerance was poor, managing just 400 metres in a six minute walk test with resultant oxygen saturations of 72%. Her Forced Expiratory Volume (FEV1), Forced Vital Capacity (FVC) and Diffusing Capacity for Carbon Dioxide (DLCO) had each worsened steadily by five percent year on year over the last decade. The most recently measured values from 2007 were FEV1 30%, FVC 28% and DLCO 24% of predicted values although the patient reported that her pulmonary function had deteriorated significantly during pregnancy. On admission the patient was breathless at rest with a p02 of 7.63 on room air and it was felt that natural labour would not be possible due to poor physiological reserve. Severe reflux secondary to oesophageal dysmotility rendered her unable to recline more than 45 degrees and she could therefore not lie flat for awake caesarean section. Airway assessment revealed microstomia of less than one centimetre, mallampati four, bucked teeth, sub mental skin scleroderma and a narrow hooked nose with small nostrils. Oral intubation was therefore ruled out. Awake Fibre Optic Intubation (AFOI) appeared technically challenging due to nasal anatomy. Preoperative, bedside nasendoscopy revealed that AFOI would be possible should the need to secure the airway arise mid operation. This avoided the need to perform an AFOI or awake tracheostomy pre-operatively. The patient was positioned at 45 degrees on the operating table. Surgeons confirmed that they could operate in this position. A low dose spinal followed by an epidural which was topped up gradually over 30 minutes using small incremental boluses achieved adequate block without compromising respiratory function. Surgery was completed without issue and both mother and baby did well post-operatively.

Discussion: There are only three reports in the literature describing general anaesthesia for caesarean section in patients with scleroderma and two using neuraxial blockade.1,5 Of those who were intubated, one died and another required three months ventilation. We demonstrated how careful bedside airway assessment and the use of a slow top up epidural were successfully used to manage this challenging case.

References
P119 Anaesthetic management of arrhythmogenic right ventricular cardiomyopathy during labour and caesarean section: a case series
J Eccles, A Jain, K Bhatia
Department of Anaesthesia, St Mary's Hospital, Manchester, UK

Introduction: Arrhythmogenic right ventricular cardiomyopathy (ARVC) is mainly a genetically determined autosomal dominant disease characterised by cardiomyocytes being replaced by fibrofatty tissue in the right ventricle.1 ARVC has an incidence of 1:5000 and may account for as many as 5% of unexpected sudden deaths. The Eighth Report of the Confidential Enquiries into Maternal Deaths in the United Kingdom (2006-2008) highlighted that ARVC was the underlying cause in two of the 53 reported cardiac deaths. We describe the anaesthetic management of two parturients with ARVC who presented at our tertiary centre.

Case reports: The maternal demographics, the cardiac signs, symptoms and interventions along with the anaesthetic management in the peri-partum period are briefly summarised in the table below.

<table>
<thead>
<tr>
<th>Category</th>
<th>Case 1</th>
<th>Case 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>27</td>
<td>23</td>
</tr>
<tr>
<td>BMI</td>
<td>25.8</td>
<td>27.2</td>
</tr>
<tr>
<td>Parity</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Family history</td>
<td>None</td>
<td>Sudden death</td>
</tr>
<tr>
<td>Cardiac signs and</td>
<td>Palpitations with spurs of</td>
<td>Paroxysmal VT</td>
</tr>
<tr>
<td>symptoms</td>
<td>ventricular tachycardia (VT)</td>
<td></td>
</tr>
<tr>
<td>Cardiac intervention</td>
<td>Cardiac ablation therapy and ICD insertion</td>
<td></td>
</tr>
<tr>
<td>to pregnancy</td>
<td>implantable cardioverter</td>
<td></td>
</tr>
<tr>
<td>Mode of delivery</td>
<td>Elective caesarean section</td>
<td>Urgent LSCS for (LSCS) for breech</td>
</tr>
<tr>
<td>Anesthesia and analgesia</td>
<td>General anaesthesia, with</td>
<td>Labour epidural</td>
</tr>
<tr>
<td>Maternal length of stay</td>
<td>Three days</td>
<td>Four days</td>
</tr>
<tr>
<td>Neonatal Apgar scores</td>
<td>8 and 10</td>
<td>9 and 10</td>
</tr>
</tbody>
</table>

Discussion: The main implications of ARVC in parturients include fatal arrhythmias, heart failure worsened by physiological changes of pregnancy and sudden adult death syndrome.1 Both our patients had VT diagnosed after 24 hour Holter monitoring, and an ICD was implanted in addition to beta blocker medical therapy to control the symptoms of VT as well as to prevent sudden death. The patients were seen in the joint cardiac, obstetric and anaesthesia antenatal clinic and a peri-partum plan formulated to facilitate safe delivery. Both had serial echocardiograms, serum electrolytes monitored, invasive blood pressure monitoring and ICD deactivated during their LSCS. Our case series highlights why both general and regional anaesthesia can be safely provided and we recommend a multidisciplinary approach with close cooperation between anaesthetists, cardiologists and obstetricians to provide optimum care of these patients.

Reference

P120 Anaesthetic management of obese parturients at a tertiary centre - meeting the standard?
J Kellner, J Teare, E Evans
Anaesthesia, St George's Healthcare NHS Trust, London, UK

Introduction: Obese women are at increased risk of perinatal morbidity and mortality. In 2010 CMACE and RCOG published joint guidelines for the management of the obese parturient including recommendations that patients with a booking BMI ≥40 should attend an antenatal anaesthetic clinic (AAC) and a Specialist Trainee year 6 anaesthetist (ST6) or above should be informed and available to attend labour and operative delivery.1 Our unit is a tertiary centre with over 5,000 deliveries/year. A previous audit over 2 years showed that of 120 women with BMI ≥40 attending our AAC, 76% required a peripartum anaesthetic intervention, with only 34% of these performed by an anaesthetist ≥ST6.2 Awareness of the guidelines was raised and anaesthetic plans for these women now state care should be managed by a senior anaesthetist. We examined our obese population following these changes.

Methods: A retrospective analysis over 1 year (2011-12) of hospital records for patients with a booking BMI ≥40. Records were examined for referral and attendance at AAC, anaesthetic intervention (regional/GA), grade of anaesthetist and anaesthetic complication (difficult/impossible regional, dural tap, other).

Results: In total there were 74 women with a booking BMI ≥40. 73% were referred to AAC, only 58% attended. Out of all patients, 69% had a peripartum anaesthetic intervention, 43% of which were performed by an anaesthetist ≥ST6 with a complication rate of 16%. Of those attending AAC, 67% had an anaesthetic intervention, 41% of which were performed by a ≥ST6 with a complication rate of 17%. Of those patients not attending AAC, 71% had an anaesthetic intervention and 36% of these were performed by ≥ST6 with a complication rate of 14%.

Table 1. Incidence of complications by grade of anaesthetist

<table>
<thead>
<tr>
<th>Group</th>
<th>≥ST6</th>
<th>&lt;ST6</th>
<th>p value (Fisher’s Exact)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>9.1%</td>
<td>20.7%</td>
<td>0.440</td>
</tr>
<tr>
<td>AAC</td>
<td>16.7%</td>
<td>17.6%</td>
<td>0.945</td>
</tr>
<tr>
<td>No AAC</td>
<td>0%</td>
<td>21.4%</td>
<td>0.273</td>
</tr>
</tbody>
</table>

Discussion: This audit shows a significant number of obese parturients were not seen in our AAC. A proportion of these were referred, but did not attend however 27% were not referred. Despite this, there was no significant difference in the requirement for anaesthetic intervention or the incidence of anaesthesia-related complications between attenders and non-attenders. The incidence of senior anaesthetic involvement in care has risen from 34% to 41% but there is still room for improvement. This highlights the resource difficulties faced in providing 24 hour senior anaesthetic cover. The on-call rota at our unit is staffed by junior and senior anaesthetists. The absence of a senior anaesthetist did not lead to a significant rise in anaesthesia-related complications, although there was a trend toward this (Table 1).

References
P121 Anaesthetic management of the labouring patient with multiple sclerosis
J Li Wan Po, K Maclennan
Anaesthesia, St Mary's Hospital, Manchester, UK

Introduction: Multiple Sclerosis (MS), an autoimmune inflammatory disease affecting the central nervous system, is estimated to affect 20,000 or more UK women of childbearing age. Controversy exists regarding the management of anaesthesia and analgesia in labouring parturients with MS. Following analysis of our practice at St Mary's Hospital, a tertiary referral obstetric unit with over 8500 deliveries per annum, and recent evidence in the literature; our recommendations for the peri-partum management of parturients with MS are presented.

Methods: Interrogation of the St Mary’s Hospital antenatal clinic database, from 1999 to 2012, identified 21 pregnant women diagnosed with MS. We reviewed antenatal advice, intrapartum management and postpartum complications.

Results: Over 50% of patients were multiparous. The majority had mild sensory or motor deficit. Three relapsed during pregnancy, one improved in symptoms and one relapsed postpartum. There were twelve normal vaginal deliveries, two instrumental deliveries, six Caesarean sections and one unspecified delivered at another hospital. Five women opted for epidural analgesia, two were topped up for operative delivery. Five had spinal anaesthesia with 0.5% heavy bupivacaine and one had a general anaesthetic. There were no complications following regional technique.

Discussion: A recent national survey reported that within a 10 year period, 91% of anaesthetists have encountered < ten cases of MS and have little experience in their management during pregnancy. Recent evidence available supports our current management of MS patients undergoing labour. The low incidence of the disease makes it difficult to attain significant figures to determine the optimal management plan. To standardize care, we made the following recommendations based on the latest evidence and our own experience:

- Patients to be reviewed in an antenatal anaesthetic clinic. Document disease severity and discuss analgesia and anaesthetic options.
- Use of 0.1% bupivacaine with 2mcg/ml fentanyl mixture for epidural labour analgesia. For an operative intervention, top up with a higher concentration of local anaesthetic.
- Regional rather than general anaesthetic for caesarean sections. Spinal anaesthesia is the most simple and reliable technique although consider combined spinal-epidural on an individual basis.
- If a general anaesthetic is necessary, avoid suxamethonium and monitor neuromuscular block to titrate dose of non-depolarizing muscle relaxant.

These recommendations will be available for clinicians on the trust intranet and a patient information leaflet on the effects of pregnancy and anaesthesia on MS has been produced.

References

P122 Anesthetic implications of heart disease in pregnancy
S Francés, S Manrique, M Goya, M Garcia, R Perera, N Moniferrer
Anaesthetics, Vall d’Hebron University Hospital, Barcelona, Spain

Introduction: Despite advances in its diagnosis and treatment, heart disease (HD) in pregnancy remains a major cause of non-obstetric maternal and neonatal mortality and morbidity (it complicates around 1-3% of pregnancies in developed countries). Accurate multidisciplinary assessment and management of individual maternal and fetal risks in pregnant women with HD provides the best opportunity to substantially improve outcomes for mother and baby. (1).

Methods: We present a prospective cohort study that analyzed outcomes in women with HD, the majority of whom had had corrective surgery and delivery between 2007 and 2013. Baseline characteristics and adverse events during delivery and postpartum were assessed. Intensive monitoring of the delivery and postpartum were planned beforehand in all cases.

Results: One hundred and seventy-four patients with 179 pregnancies were included in the study. 127 women (72.98%) presented congenital heart disease (CHD), 47 acquired heart disease (27.02%): 27 acquired rheumatic valve disease (19.98%), one Marfan syndrome (0.54%), 3 coronary heart disease (1.6%) and 9 primary myocardial disease (4.9%).

Pregnancy complications were presented in 21, 2% of CHD, 14.8% of acquired rheumatic valve disease and 100% of women with arrhythmias. The type of delivery was vaginal in 124 women (72.1%) and cesarean section in 50 women (27.9%).

168 women had analgesia during delivery (93.8%); 5 women, general anesthesia (2.79%), 6 women, local anesthesia (3.35%) and 87.5% of women had regional analgesia.

Delivery complications were 7% (uterine atony 2.7%, vaginal hematoma 2.2%, chorioamnionitis 0.5%, cesarean hematoma 0.5% and hemoperitoneum 0.5%). The only anesthesia complication was one dural puncture (0.5%). No maternal death, one fetal death (0.5%) and one neonatal death (0.5%).

The maternal average hospital stay was 3 days.

Discussion: Pregnancy and delivery are associated with substantial physiological changes, which require the adaptation of the cardiovascular system and can expose women with HD to significant risks. If regional anesthesia is selected, the addition of an opioid, when dosing any neuraxial anesthetic, will reduce the amount of local anesthetic required and subsequent hemodynamic effects, while improve intraoperative and postoperative analgesia. The avoidance of epinephrine from the epidural dose will eliminate the possible deleterious effects of systemic epinephrine. Maintaining uterine blood flow is important for fetal well-being. Maintaining systemic vascular resistance in patients with intravascular shunting, is important to avoid inducing or exacerbating pre-existing cyanosis due to increased right- to – left shunting. Cautious intravenous hydration and gentle titration of phenylephrine or ephedrine are options to counteract the hemodynamic effects of surgical neuraxial block (1,2).

We observed a predominance of neuraxial anaesthetic techniques, increased caesarean and operative delivery rates, and favourable maternal and neonatal outcomes.

References
P123 Angle of tilt achieved with automated operating table in elective caesarean sections: a comparison with tilt achieved with an inflatable balloon wedge
PN Nair, L Dyal, B Grewal, I Suri
Department of Anaesthesia, Warwick Hospital, Warwick, UK

Introduction: A previous study done on patients undergoing elective caesarean sections looked into measuring the angle of tilt of the operating table with an inflatable balloon wedge. This showed that the visual estimation of angle proved accurate in the achievement of near 15° tilt. Here we present the results of a similar study using a different technique of automated table tilt instead of the inflatable balloon wedge device. The premise being is our visual actuation of tilt angle accurate.

Methods: The study was similar to the previous one. We prospectively selected 26 patients at random who were undergoing elective lower segment caesarean section under spinal anaesthesia over a six week period. Ethical committee approval was obtained. Verbal consent was obtained from all participants and the booking Body Mass Index (BMI) was noted. We used the same protractor device for measuring the angle of tilt. This is similar to the one used by Kinsella et al.2

Results: The measured angles ranged from 10 to 18 degrees, a mean angle of 13.7° with a mean difference of -1.3 and standard deviation of 2.32. This compared very closely to the angles between 10 to 17.5 degrees, mean angle of 13.65°, mean difference of -1.35 and a standard deviation of 2.06 in the previous study. BMIs ranged from 19 to 37 with a mean of 24.

Discussion: The visual estimation of angle using the automated table tilt proved accurate in achieving the near 15° tilt and is comparable with that obtained with the inflatable balloon wedge device in the previous study. The standard deviation of 2.32 indicates that 95.4% of cases could achieve within 4.6° of the required 15° tilt i.e. 10.4 to 19.6 degrees tilt. The automated table tilt provides an easy and accurate means of providing left lateral tilt in pregnant patients.

References

P124 Antenatal anaesthetic information given to women with obesity
C R Thomas, C Busby
Anaesthetics, Airedale General Hospital, Keighley, UK

Introduction: Antenatal obesity is defined as a BMI of ≥30 at booking. Its prevalence in England increased from 7% in 1990 to 16% in 2007.1 Women with a BMI ≥40 are often provided with anaesthetic information antenatally. Those with lower levels of obesity also have an increased anaesthetic risk but these women may receive little or no information about this during pregnancy.2 The RCoA have produced standards regarding care for these women: 90% of patients with a booking BMI ≥30 should receive a leaflet containing information about anaesthesia and analgesia. 90% of patients with a booking BMI ≥40 should have an anaesthetic consult. Booking BMI should be documented in 100% of maternity hand-held notes. An audit of the above standards was carried out as summarised below.

Methods: A list of all deliveries in January 2013 was generated. Notes were reviewed for adherence to the above three standards. Change to practice was recommended based on audit findings. Following the implementation of change, the audit cycle was completed by auditing notes of all deliveries in November 2013.

Results:

Table: Recording of booking BMI, patient count by raised BMI category and number given anaesthetic information.

<table>
<thead>
<tr>
<th>Number of deliveries</th>
<th>Unavailable cases</th>
<th>No booking BMI</th>
<th>BMI 30 - BMI 35</th>
<th>BMI ≥40</th>
<th>BMI 30 - BMI 35</th>
<th>BMI ≥40</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td>info</td>
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<td>given</td>
<td>given</td>
<td>given</td>
<td>given</td>
</tr>
<tr>
<td>Jun 195</td>
<td>6</td>
<td>2</td>
<td>20; 0</td>
<td>7; 1</td>
<td>7; 7</td>
<td></td>
</tr>
<tr>
<td>Nov 173</td>
<td>3</td>
<td>2</td>
<td>17; 2</td>
<td>7; 7</td>
<td>3; 3</td>
<td></td>
</tr>
</tbody>
</table>

Discussion: Booking BMI was recorded in 99% of the notes in both audit cycles. In 100% of cases where BMI was ≥40, a consultant anaesthetist discussed risk and made a plan with the patient. However, the audit of January deliveries indicates that few women who have a BMI 30-39.9 receive anaesthetic information; this occurred in only one case. Reaching this population to provide information is difficult especially where BMI is 30-34.9 as all antenatal care for this group may be provided by community midwives. In collaboration with Obstetrics, a patient information leaflet was written which included both obstetric and anaesthetic information. The leaflet was approved by the Women’s Integrated Governance group and has been in use since October 2013. It is available on the Trust intranet which is accessible by some community midwives. The leaflet is given to all those with a BMI ≥ 35 when they attend obstetric high risk clinic. The results of the November audit indicate improvement has been made; 44.4% of those with obesity now receive anaesthetic information. Greater access to the leaflet is needed however.

References
P125 Antenatal management of morbidly obese parturients: A multicentre evaluation.

H Aladin, A Khandhia, K Pottinger
Anaesthetics, Good Hope Hospital, Birmingham, UK

Introduction: Women with a body mass index (BMI) of ≥30 kg/m² at the time of antenatal booking are classed as being obese in pregnancy, accounting for around 30,000 pregnancies per year. Obesity is associated with increased risk of anaesthetic morbidity and mortality. National guidance have been developed following the Confidential Enquiry into Maternal and Child Health report concerning obesity in pregnancy. At two different hospitals, five indicators of best practice were analysed: (1) Recording of maternal BMI. (2) BMI ≥ 30 women receive information about anaesthesia/analgesia. (3) Women with a BMI ≥ 40 have antenatal anaesthetic review. (4) Duty anaesthetist should be informed when women with a BMI ≥ 40 are admitted. (5) Anaesthesia for women with a BMI ≥ 40 should be provided by a senior anaesthetist.

Methods: Women who had undergone a lower segment caesarean section (LSCS) during a 6 month period (Jan 2013-Jun 2013) at a District General Hospital (DGH) and a Foundation Hospital (FH) were evaluated. Data was collected retrospectively from an electronic data archive and anaesthetic charts. Evidence of BMI calculations, provision of anaesthesia/analgesia information, ante-natal anaesthetic appointments, and anaesthetic care in the labour ward and theatre were identified.

Results: 309 women who underwent an LSCS were identified with a having a BMI ≥30 (median 34, range 30–59). 51% of these were elective cases. 56% of women with a BMI ≥30 received anaesthesia/analgesia information, of which 2 were given literature on anaesthesia in obesity. 32% of women with a BMI ≥40 underwent an antenatal anaesthetic review, with an additional 4 women failing to attend their appointments. In those women with a BMI ≥40, the duty anaesthetist was informed of admission in 19% of cases and in 56% of LSCS, the anaesthetic care was provided by an appropriately graded anaesthetist.

Table: Women with BMI ≥30 having anaesthetic care at a DGH and FH.

<table>
<thead>
<tr>
<th></th>
<th>DGH</th>
<th>FH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total LSCS</td>
<td>32% (99/309)</td>
<td>68% (210/309)</td>
</tr>
<tr>
<td>BMI Median (range)</td>
<td>33 (30–59)</td>
<td>34 (30–52)</td>
</tr>
<tr>
<td>Maternal height, weight + BMI recorded</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Conclusion: This audit has identified that more than half the women with a BMI ≥30 received analgesia/anaesthesia information and more than half were anaesthetised by a senior anaesthetist. However, in all the areas of practice, the target percentage of women meeting the identified standards were not achieved. Recommendations included revision of the referral guidelines for antenatal anaesthetic assessment, improved communication within the multidisciplinary team during admissions and increased presence of senior anaesthetists on delivery suite.

References

P126 Audit of temperature for patients undergoing elective caesarean section

N J Truman, I Clegg, K Maclellan
Anaesthetics, St Mary's Womens Hospital, Manchester, UK

Introduction: Perioperative Hypothermia is associated with poor outcomes and adverse events for patients; including surgical site infection increased length of stay, blood loss, shivering, increased anaesthetic recovery time and cardiac events. Risk factors for the occurrence of hypothermia include regional anaesthesia, fluid deprivation, blood loss, and cold fluid administration, all of which are common to obstetric patients. 2008 Nice guidelines CG65 for perioperative hypothermia do not include parturients, despite being an at risk group. An audit performed in 2011 at St Mary's Hospital demonstrated that 92.5% of elective section patients were not ‘comfortably warm’ on arrival in recovery, with 65% defined as hypothermic. A repeat audit was performed following commencement of a trial of an air free conductive fabric patient warming system (Hot Dog®).

Method: A prospective audit of elective caesarean section patients was conducted from April–June 2013 at St Mary’s Hospital. Theatre staff completed the audit proforma. Data collected included; ambient theatre temperature (ideal target > 21°C), anaesthetic type, estimated blood loss (EBL), temperature pre, intra, post operative and prior to discharge from recovery (measured using a tympanic membrane thermometer) and details of which Hot Dog® warming products were used. Hypothermia was defined as a core temperature <36°C with desirable temperature being defined as 36.5-37.5°C. Comparison of the results from the 2011 audit enabled conclusions to be drawn regarding the effectiveness of the warming product.

Results: A total of 33 patients were audited who underwent elective caesarean section, [n=79, 2011 audit], 94% had spinal anaesthetic (87%, 2011 audit). Mean (S.D) theatre temp was 22.8 ± 0.6 (22.3 ± 0.6, 2011 audit), mean duration of procedure was 51 minutes, 94% of patients had an additional fluid warmer intra-op (72%, 2011 audit). The mean EBL was 574 ml (± 213) (653 ± 431, 2011 audit) and only 6% of patients had an EBL over 1L (20% 2011 audit). Only 12% (n=4 of 33) of patients warmed with the HotDog® were hypothermic on arrival to recovery (compared to 65% (n=51 of 79), 2011 audit) figure 1.

Discussion: efforts have been to reduce perioperative hypothermia in elective caesarean sections. Almost all patients received warmed fluids via a 3M™ Ranger™ fluid warming system. Forced air warming devices applied to the upper body are not well tolerated by our awake patient population and allow only a limited area to be heated. introduction of HotDog® with an under patient warming mattress and separate over patient warming blanket (for upper and lower limb) proved to be of benefit in perioperative maintenance when compared to our standard warming measures. A HotDog® warming mattress placed on the patient chair in the pre theatre waiting area helped prevent hypothermia pre arrival in theatre.

Reference
P127 Availability of chlorhexidine handwash for regional analgesia on the labour ward
K Chima, T Strickland, F Plaut
Anaesthetics, Queen Charlotte’s and Chelsea Hospital, London, UK

Introduction: Many patients request regional analgesia during labour and therefore central neuraxial blocks are performed in the delivery room. For central neuraxial blocks an aseptic technique should be standard. In the Third National Audit Project of the Royal College of Anaesthetists the incidence of iatrogenic infection was reported as being 8/707 000 procedures. However the consequence of any infection is potentially devastating, and a ‘scrupulous’ aseptic technique was therefore stated to be mandatory in the report. Chlorhexidine gluconate 4% is used for hand decontamination in our department. It was noticed that not all delivery rooms were equipped with both chlorhexidine and a hands free method for application.

Methods: All delivery rooms on labour ward were inspected to ascertain the presence of chlorhexidine and a hands free dispenser.

The audit was repeated after one and twelve months to assess if there had been any improvement in the service.

Results: Originally, 12 of the 16 delivery rooms had chlorhexidine available (75%). Of the 12 rooms with chlorhexidine only three were equipped with a hands free dispenser (25%), and five containers were uncovered (42%).

After one month all 16 rooms were equipped with wall mounted chlorhexidine with a hands free dispenser (100%).

After a further 12 months it was found that 12 of the 14 delivery rooms had chlorhexidine available (86%). (Two of the rooms had been converted to a post delivery high dependency unit). Eleven of the 12 containers were equipped with a hands free dispenser (92%).

Discussion: The results of the initial data collected, as well as anaesthetists’ concerns regarding the unavailability of chlorhexidine and dispensers in each room, was reported to managerial staff, who ensured all rooms were adequately stocked. Results were therefore better when re-auditing was performed at one month. However, after 12 months standards had declined, although they were still improved from the initial audit. This decline could be attributed to the fact that neither a team nor a named individual was made responsible for sustaining the initial improvement, which if introduced, we feel would encourage a sense of ownership and enable the improvement in this area of patient safety to be sustained.

Reference

P128 Caesarean section in a rhesus null parturient with a uterine fibroid
P J Stewart, R Laird, J Cartmill
Anaesthetics, Altnagelvin Area Hospital, Londonderry, UK

Introduction: The anaesthetic management of a Caesarean section is made more challenging by the combination of pre-operative anaemia, a large uterine fibroid and the presence of a very rare blood group Rhesus null.

Case report: A forty-year lady with a past medical history of psoriatic arthritis presented to antenatal booking at 10 weeks gestation. Booking investigations revealed a haemoglobin of 10.3g/dL, and a blood group O Rhesus null. Her 20-week ultrasound scan revealed no foetal anomalies but did demonstrate an anterior uterine fibroid. This was confirmed with magnetic resonance imaging which showed a heterogeneous mass measuring 18x139x159mm, in keeping with a degenerating fibroid. At 21+3 days she presented with dizziness and right upper quadrant pain. Her haemoglobin level was 7.6g/dL and she was treated for iron deficiency anaemia. Due to a transverse lie and the large fibroid an elective Caesarean section at 38 weeks was planned. As a team we anticipated a difficult Caesarean delivery with greater blood loss in a patient with anaemia and a very rare blood group. Antenatal management focused on maximising the patient’s haemoglobin levels and sourcing compatible blood. The Northern Ireland blood transfusion service and National frozen red cell bank in Liverpool secured two units of packed red cells in England. Unfortunately, one week prior to the section this blood was issued in an emergency, making it unavailable to us. A new donor was found in South Africa and a further unit was secured in Brazil. Both units were couriered to our hospital prior to the Caesarean delivery which was performed at 38+6 days under spinal anaesthesia. Pre-operative haemoglobin was 9.1g/dL. The patient was discharged home on day three post-operatively and her haemoglobin was 7.2g/dL on discharge. No blood transfusion was required.

Discussion: Red blood cells from people who have the Rhesus null phenotype lack Rhesus proteins, and thus, Rhesus antigens. This phenotype occurs in approximately 1 in 6x10^6 individuals. When these patients are transfused they may form antibodies to high frequency rhesus antigens, which can make it extremely difficult to process compatible blood. Rhesus null blood is available from the National frozen cell bank, however it may not be available when required due to limited supplies, as in our case. There is very limited literature regarding the management of the rhesus null parturient and our management was guided by our regional Haematology unit. This case demonstrates the importance of good communication with all members of the multi-disciplinary team and the detailed preparations required in a complex case.

Reference
P129 Category one caesarean sections in a district general hospital: Improving the decision to delivery time

VK Wroo, AM Troy
Department of Anaesthesia, Countess of Chester Hospital, Chester, UK

Introduction: National Guidelines state that the interval from decision to delivery (DDI) in a category one caesarean section should be less than 30 minutes, and that a duty anaesthetist should be immediately available for emergency work on the delivery suite 24 hours a day.

A 2008 departmental audit found that 85% of category one sections had a DDI of under 30 minutes, a figure marginally under the audit standard of 90%. Anaesthetic service provision in our trust was expanded in July 2012, with the addition of a dedicated obstetric anaesthetist 24 hours a day. This re-audit aimed to assess the proportion of category one caesarean sections with a DDI <30 minutes and analyse the factors contributing to any delay.

Methods: After audit department approval, a retrospective analysis of category one caesarean sections between August and December 2012 was performed. Data collected included DDI and reason for delay, indication for section, type of anaesthesia and cord pHs.

Results: 69 category one caesarean sections were analysed. The mean DDI was 23 minutes (range 3-120 minutes). 84% had a DDI of under 30 minutes, with a mean time from decision to effective anaesthesia of 14.5 minutes. The indication for caesarean section was abnormal CTG in 87% of cases (2008: 77%). General anaesthesia was performed in 43% (2008: 85%), spinal anaesthesia in 55% (2008: 15%) and extension of epidural blockade in 2%. In 11 cases, DDI was over 30 minutes; these cases were all performed under spinal anaesthesia. The following table shows the reasons identified that contributed to delay:

<table>
<thead>
<tr>
<th>Arrival in theatre</th>
<th>Spinal placement</th>
<th>Incision to delivery</th>
<th>Staff unavailable</th>
<th>Theatre unavailable</th>
<th>Decision to delivery</th>
<th>Time &gt; 10 minutes unavailable</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;10 minutes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥10 minutes</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Number of patients: 4 6 1 1 1

Arterial cord blood analysis was carried out in 10/11 cases, pH was less than 7.2 in 30%, and base excess was less than -8 in 20%.

Conclusion: The proportion of cases with a DDI of over 30 minutes has remained constant at around 15%, despite an improvement in anaesthetic staffing. Our results suggest that the causes for this delay are multifactorial, and the results not be monitored by the delivery led to a cord pH of <7.2 in almost one third of cases. We intend to improve our practice by regular practice drills, use of prepared spinal packs to reduce spinal placement time, clear procedures to follow in the case of staff or theatre unavailability and readad.

References

P130 Comparison of two non-invasive cardiac output monitoring devices in a parturient with complex cardiac disease

PJ Rose, V Misra, S Quasim
Anaesthesia, UHCW, Coventry, UK

Introduction: The management of valvular lesions during pregnancy and labour can present a clinical conundrum. We present the use of two cardiac output (CO) monitoring devices in a parturient with complex valvular heart disease undergoing a caesarean section under epidural anaesthesia.

Case Report: A 37 year old primiparous woman with history of ASD repair aged 4, severe mitral regurgitation, severe tricuspid regurgitation, moderate aortic stenosis (AS) secondary to a congenital bicuspid valve and moderate pulmonary hypertension presented for elective caesarean section. Echocardiography showed moderately dilated right ventricle with good bi-ventricular systolic function, bi-atrial dilatation, moderate to severe AS (mean gradient 34mmHg, peak gradient 53mmHg, estimated valve area 0.74cm²). Pulmonary artery pressures were estimated at 42-47mmHg. LiDCO rapid and Cheetah NICOM devices were used to monitor CO. Anaesthesia was established with 32ml 2% lignocaine and 100 micrograms of epinephrine via epidural. Compound sodium lactate was infused at 60ml/hr, and increased to 100ml/hr after epidural anaesthesia. Fluid boluses of 200ml and 100ml were delivered via the pump at 13 and 28 minutes after delivery of a live infant. Metaraminol infusion was titrated to effect. Syntocinon infusion was started upon delivery (20 units in 48ml 0.9% saline) at 15ml/hr and tapered post-operatively over 4 hours. Mean arterial pressure was maintained at 91 to 97mmHg until delivery (78 minutes) and then decreased to 67mmHg at the end of surgery. Cardiac output was maintained throughout surgery with an increase at the time of concurrent fall in MAP. Fluid challenge had negligible effect although there was a small reduction in heart rate (84 to 59bpm).

Discussion: NICE has advocated the use of cardiac output monitoring in high risk non-obstetric surgery to improve outcome. In this case we utilised both a non-calibrated pulse-contour waveform analysis and bioreactance system to compare both values measured and response to fluid challenge. Although the values produced were different, the trends were broadly similar. This, once again, highlights the importance of analysing trends rather than absolute values to guide management. Interestingly, both devices demonstrated that a fall in MAP correlated with an increase in cardiac output, similar to previous investigators. Given that cardiac disease is the leading cause of death in the most recent triennial report, monitoring cardiac output enables one to maintain physiological homeostasis, and ultimately aids clinical decision-making leading to good clinical outcome, as in our case.

References
P131 Comparison of slow and rapid bolus of ephedrine in patients undergoing planned caesarean section under spinal anaesthesia WITHDRAWN FROM PRESENTATION
PG Sekar, LB Ellakumanan, H Balachander, MVS Satyaparaksh
Anaesthesiology, JIPMER, Puducherry, India

P132 Continuous spinal anaesthesia for a primigravida with severe tricuspid regurgitation, Harrington rods and thrombocytopenia.
AM Walton, I Mettam
Obstetric Anaesthetic Department, University Hospital Southampton, Southampton, UK

Introduction: We present the successful use of continuous spinal anaesthesia (CSA) for caesarean delivery in a parurient with severe tricuspid regurgitation and pregnancy-induced thrombocytopenia in addition to Harrington rod placement for scoliosis spinal surgery.

Case history: A 40 year old primigravida presented at 37 weeks gestation. She had undergone a tricuspid valve repair previously for endocarditis. The patient had developed severe tricuspid regurgitation and had heart failure. Harrington rods were placed in her thoracic and lumbar spine for repair of a congenital scoliosis. Blood tests revealed a pregnancy related thrombocytopenia with platelets of 85x10^9/L. An echocardiogram showed a severely dilated right atrium with intra-atrial septal bowing to the left, severe free flowing regurgitation and right ventricular systolic pressure 32mmHg. The case was discussed with obstetricians, anaesthetists and cardiologists and a decision was made for an elective caesarean section under CSA, if the final platelet count remained stable. The patient expressed a preference to remain awake and avoid a general anaesthetic. At surgery a cannula and radial arterial line were inserted. In the sitting position a 22G spinal needle was inserted below the level of the scar tissue at L3/4, and a spinal catheter threaded into the subarachnoid space. A total of 10mg bupivacaine and 250mcg diamorphine were required over 20 minutes to establish a block to T4. The blood pressure dropped from 135/70 to 90/50mmHg and required only 5mcg of epinephrine to return to baseline values. Blood loss was 720mls. Syntocinon was given as an infusion only. A live male infant was delivered.

Discussion: An obstetric anaesthetist has to take many factors into account when deciding on the best choice of anaesthetic for a particular case; anaesthetic expertise, maternal co-morbidities, fetal well-being and maternal preferences all play a part. Cardiac disease in pregnancy is still the leading cause of indirect maternal mortality in the UK. The choice of anaesthetic and delivery had to ensure the least amount of strain on an already compromised heart. The advantages of CSA are that a block can be established gradually with small incremental doses of local anaesthetic, which reduces the likelihood of cardiovascular instability. The concerns with a CSA are principally neurological complications and post-dural puncture headache. CSA is proving an option to be considered for patients with significant cardiac disease and previous spinal surgery provided the anaesthetist has experience with the technique. In this case it provided a cardiovascularily stable anaesthetic with excellent analgesia and maximal maternal satisfaction.

References
P133 Does pre-operative anxiety predict post-operative pain scores in parturients undergoing caesarean section?

BM Daly, N Weidenhammer, R Junkin, L Riddell, J Dolan, J Kinsella*, R Marla, S Young

Anaesthesia, Princess Royal Maternity, Glasgow, UK,
*Anaesthesia, Pain & Critical Care Medicine, University of Glasgow, Glasgow, UK

Introduction: Pregnancy, childbirth, and undergoing a surgical procedure are all likely to induce anxiety. The relationship between anxiety, pain and pregnancy is complex. 1 Childbirth is a time of high anxiety, and Caesarean section is known to be associated with significant pain post-op. Here we ask can anxiety scoring predict post LSCS pain?

Methods: After ethical approval and consent, pre-operative data and a single 24hr post-op 10cm VAS were collected from 108 women, with 9 having missing data. Spielberger 2 State and Trait anxiety forms were completed prior to surgery. We present secondary end points powered post hoc for 0.8 probability of 2cm VAS difference. A standardised anaesthetic (spinal including diamorphine) and analgesic regime was used. The cohort was divided into "high" - above the mean and "low" - below the mean anxiety and compared using Student's t-test.

Results:

Table 1: State anxiety compared to VAS

<table>
<thead>
<tr>
<th></th>
<th>Low anxiety (n=45)</th>
<th>High anxiety (n=54)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 hr VAS mean (SD) cm</td>
<td>5.0 (2.2)</td>
<td>5.3 (2.0)</td>
<td>P= 0.40</td>
</tr>
</tbody>
</table>

Table 2: Trait anxiety compared to VAS

<table>
<thead>
<tr>
<th></th>
<th>Low anxiety (n=48)</th>
<th>High anxiety (n=55)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>24hr VAS mean (SD) cm</td>
<td>4.8 (1.9)</td>
<td>5.5 (2.2)</td>
<td>P=0.15</td>
</tr>
</tbody>
</table>

Table 3: State + Trait anxiety compared to VAS

<table>
<thead>
<tr>
<th></th>
<th>Low anxiety (n=48)</th>
<th>High anxiety (n=51)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>24hr VAS mean (SD) cm</td>
<td>4.8 (1.9)</td>
<td>5.6 (2.1)</td>
<td>P=0.072</td>
</tr>
</tbody>
</table>

Discussion: While the higher anxiety groups displayed a higher mean VAS in all the analysis, this was not statistically significant. The separation between the two groups was better with the State than the Trait anxiety score and best of all when the two scores were combined. Further research could look at anxiety scoring as part of a bundle of other measures versus pain.

References
2. www.mindgarden.com

P134 Early epidural analgesia may increase caesarean section rate in spontaneously labouring nulliparous women: a retrospective study

R Anil Kumar, Roger Mc Morrow

Anaesthesia, National Maternity Hospital , Dublin, Ireland

Introduction: Epidural analgesia offers the most effective method of intra-artum pain relief. The effect of epidural analgesia on the progression of labour and the mode is often debated in multiple studies. This study aims to show the effect of timing of epidural analgesia on the mode of delivery.

Method: Data such as women's age, gestational age, cervical dilation before epidural insertion and duration of labour was collected from a total of 2029 nulliparous women in spontaneous labour. Epidural analgesia was defined as early at a cervical dilatation of 3cms or less and late at a cervical dilatation of 4 or more cm

Results: Of the 2029 women, 1423 (70.1%) received epidural analgesia. Out of the 2029 women, 1403 (69.2%) had spontaneous vaginal delivery, 478 (23.6%) had assisted delivery and 146 (7.2%) had caesarean section.

The data was analysed according to the timing of epidural analgesia or no epidural analgesia and modes of delivery.

<table>
<thead>
<tr>
<th>Anaesthetic intervention</th>
<th>Delivery method</th>
<th>Spontaneous</th>
<th>Assisted</th>
<th>Caesarean</th>
</tr>
</thead>
<tbody>
<tr>
<td>No epidural</td>
<td>537 (88.9%)</td>
<td>51 (8.4%)</td>
<td>16(2.6%)</td>
<td>604</td>
</tr>
<tr>
<td>Early epidural</td>
<td>757 (62.2%)</td>
<td>379 (30%)</td>
<td>126 (10.0%)</td>
<td>1262</td>
</tr>
<tr>
<td>Late epidural</td>
<td>109 (67.7%)</td>
<td>48 (29.8%)</td>
<td>4 (2.5%)</td>
<td>161</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Epidural analgesia</th>
<th>Assisted delivery OR</th>
<th>95% CI</th>
<th>P-value</th>
<th>C-Section OR</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early epidural</td>
<td>5.27</td>
<td>3.86, 7.21</td>
<td>&lt;0.001</td>
<td>5.59</td>
<td>3.28, 9.51</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Late epidural</td>
<td>4.64</td>
<td>2.97, 7.23</td>
<td>&lt;0.001</td>
<td>1.23</td>
<td>0.40, 3.76</td>
<td>0.71</td>
</tr>
</tbody>
</table>

Conclusion: The results from the study show that the likelihood of having caesarean section in the early epidural group is significantly higher compared to the late epidural group, but the incidence of assisted delivery between the early and late epidural group were similar. This study also shows that there is an increased likelihood of having assisted delivery and caesarean section delivery with epidural analgesia compared to without from the study group.

References
P135 Efficacy of midwife led epidural top ups in labour—Are programmable pumps really the way forward?

E Traer, G Waters, GNB Jackson
Anaesthetic department, Royal Berkshire NHS Trust, Reading, UK

Introduction: There are an increasing number of automated techniques by which labour epidurals can be managed. Comparison reports of programmable epidural pumps regimens have shown lower total volumes of local anaesthetic may be associated with reduced rates of instrumental delivery and improved maternal satisfaction. Extended intervals between boluses with larger volume boluses was shown to use less total local anaesthetic. These reports have led us to investigate similar outcomes our unit where we have a midwife led top up (MLTU) practice.

Method: First epidural bolus administered by the anaesthetist of 20ml 0.1% bupivacaine+2μg/ml fentanyl. Data recorded at each subsequent midwife administered bolus (MLTU); bolus interval time, motor block (Bromage score of 2-4 taken as motor block), any change to the standard dose 20ml 0.1% bupivacaine+2μg/ml fentanyl and if analgesia was effective or ineffective.

Results: 50 patients audited

Midwife led epidural Top Up Data

<table>
<thead>
<tr>
<th>Mean bolus interval time (min)</th>
<th>105 (sd 26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean rate bupivacaine mg/hr</td>
<td>10.56 (sd 3.6)</td>
</tr>
<tr>
<td>Motor block (Bromage score 2-4)</td>
<td>11/48 (22.9%)</td>
</tr>
<tr>
<td>Mean time to motor block (min)</td>
<td>237 (sd 135)</td>
</tr>
<tr>
<td>NVD</td>
<td>14/48 (29.1%)</td>
</tr>
<tr>
<td>Instrumental</td>
<td>18/48 (37.5%)</td>
</tr>
<tr>
<td>LSCS</td>
<td>16/48 (33.3%)</td>
</tr>
<tr>
<td>Satisfaction excellent/good</td>
<td>46/48 (95%)</td>
</tr>
</tbody>
</table>

Discussion: In this study we found the mean interval in minutes between epidural boluses to be 105 minutes. This is greater than the average 60 minute interval of the programmable intermittent bolus (PIB) regimens. An average rate of bupivacaine 10.56mg/hr was similar to that reported with PIB and patient controlled epidural bolus (PCEA) regimens, while we report a lower rate of motor block. Given the practice of MLTU in effect is much like a PIB without PCEA, it is notable that the time between epidural boluses is longer with MLTU with less maternal motor block and high maternal satisfaction. We feel our practice promotes close epidural assessment as the midwives assess motor block and maternal satisfaction before each “top-up” and avoids the cost of the PIB/PCEA pumps.

References


P136 Emergency obstetric and neonatal care in Kenya: Addressing millennium development goals

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Introduction: In 2008, an estimated 358,000 women died from complications of pregnancy and childbirth. The overwhelming burden of this mortality occurs in the developing world, with almost 60% of deaths occurring in sub saharan Africa.1 There are also some 3.6 million neonatal deaths each year, and once again the developing world is disproportionately represented.2 In 2006, the Liverpool School of Tropical Medicine (LSTM) developed a training package entitled “Life Saving Skills, Emergency Obstetric and Neonatal Care” (LSS EOC-NCC) to try and address these huge public health issues. Courses now run in 11 countries worldwide. In October 2013, I was fortunate enough to teach on a course in Nyeri, Kenya.

Methods: A variety of teaching methods were used on the course. Didactic lecture based teaching had a limited role, with more emphasis placed on small group “break out sessions” and scenario based teaching. Pre and post course simulation based testing was undertaken, with results collated and sent back to Liverpool for analysis and assessment of efficacy of teaching.

Results: Participant feedback suggested a high level of satisfaction with the course. The impact of courses in terms of reduction in maternal and neonatal mortality remains the subject of ongoing scrutiny. One study from Somaliland demonstrated improved knowledge and skills and evidence of positive behaviour change post introduction of the course.

Conclusions: Maternal morbidity and mortality remains a huge problem in Kenya. In 2008 it’s Maternal Mortality Ratio was 488 per 100,000, one of the highest in the world. Great efforts are being made by the Kenyan government to reduce this. An ambitious target to reduce MMR to 91 per 100,000 by 2018 has been set. One step has been the introduction of the Liverpool LSS EOC-NCC course.

Acknowledgements: I would like to thank the maternal and neonatal health unit at LSTM for the opportunity to become involved, and look forward to teaching on my next course. I would also recommend the course to any obstetric anaesthetists with an interest in international health.

References

P137 Enhanced recovery after elective caesarean section: Service evaluation and quality improvement

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Introduction: Enhanced recovery (ER), a concept widely recognised within clinical specialties, is now a subject of interest within obstetrics. The core principles comprise speeding up recovery and improving patient outcomes, with associated benefits for staff and healthcare systems. The most logical starting point for the introduction of ER principles are elective caesarean section lists. Delayed surgery may lead to prolonged fasting, followed by delayed mobilisation, delayed removal of catheter and delayed discharge. A pilot audit in our hospital demonstrated a mean stay after elective caesarean section of 3.6 days, and mean preoperative fasting period of 12.4 hours. Current guidance for ER in obstetrics suggests minimal intervention to oral intake, pre-operative energy drinks, catheter removal at 12 hours post-surgery regardless of time of day, and the option of discharge home 24 hours after caesarean section where appropriate.

Methods: All elective caesarean sections were included in this service evaluation after introduction of preoperative carbohydrate drinks. Data collection included fasting time, in addition to time to mobilisation, to catheter removal and to discharge. After an initial 6 week period of data collection, the data was presented to anaesthetic and obstetric staff. Posters, a discharge proforma and a patient information leafllet were produced, and specific guidance was developed regarding preoperative carbohydrate drinks. A further 6 weeks of data collection then took place.

Results: A total of 78 consecutive patients were included, all of whom received a regional anaesthetic technique for elective caesarean section. The following table illustrates the timing of pre- and post-operative events before and after our interventions.

<table>
<thead>
<tr>
<th>Time period / hour</th>
<th>2nd 6 week period</th>
<th>Initial 6 week period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-op fasting</td>
<td>4.8 (2.8)</td>
<td>3.8 (2.5)</td>
</tr>
<tr>
<td>Post-op fasting</td>
<td>4.2 (3.5)</td>
<td>3.4 (3.5)</td>
</tr>
<tr>
<td>Total interruption to oral intake</td>
<td>9.0 (4.5)</td>
<td>7.1 (4.6)</td>
</tr>
<tr>
<td>Delivery to mobilization</td>
<td>10.2 (4.5)</td>
<td>9.0 (3.3)</td>
</tr>
<tr>
<td>Delivery to catheter removal</td>
<td>14.8 (6.6)</td>
<td>13.5 (3.5)</td>
</tr>
<tr>
<td>Delivery to discharge</td>
<td>67.3 (40.1)</td>
<td>63.3 (27.6)</td>
</tr>
</tbody>
</table>

Discussion: The introduction of patient information leaflet offering guidance regarding post-operative oral intake, mobilisation, catheter removal and early discharge, along with staff education and introduction of pre-operative carbohydrate drinks, has resulted in improvement in the timing of a number of peri-operative interventions, and a small reduction in duration of hospital admission. However, possibly due to obstetric, midwifery, paediatric and organisational reasons, discharge is rarely achieved at the potential target of 24 hours after elective caesarean section.

References
2. Enhanced recovery partnership: A better journey for patients and a better deal for the NHS. Available at: http://www.improvement.nhs.uk/documents/er_better_journey.pdf

P138 Epidural analgesia in obese parturients: can kneeling be the answer to our prayers.

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*Anaesthetics, Royal Surrey County Hospital, Guildford, UK

Severe pain is not life-threatening in healthy parturient women, it is however shown to have neuropsychological consequences. Postnatal depression may be more common when effective analgesia is not used and pain during labour has been linked with the development of post-traumatic stress disorder. There is an increasing number of obese parturients and identification and placement of the epidural can be difficult in these women.

Classically the sitting or the lateral position is used during sitting of labour epidurals. The kneeling position was first described in 1993, where 34/35 women had their labour epidural sited whilst in the kneeling position and 88.5% of the mothers were happy with this position.

I elected to try the kneeling position in an obese lady with a BMI > 40 after adjustments in the sitting position and two separate failed attempts to confidently palpate the lumbar spine. Once the lady was in the kneeling position, the lumbar spine was not only palpable but also visible and the epidural space was identified with ease. With Departmental approval I performed my labour epidurals in this manner and found it not only to be easy to site epidurals but also tolerated well. Some women complained of paraesthesia in their feet, but this was rare and eased swiftly. We decided to survey our Deanery to ascertain what positions were being utilised.

Survey: An e-survey was sent to trainees and Consultants in the South West London Deanery into what their ideal first and second choice positions used for sitting epidurals would be for labouring parturients. We then posed the same question for obese parturients (BMI > 40). They were asked if they had heard of the kneeling position and if anyone had tried it. For those who had not, we questioned why they had not tried it.

Results: We received 53 responses, 96.2% of whom were trainees. 64.2% chose to position the parturient sitting as their first choice and 60.4% chose lateral as their second choice in non-obese parturients. In comparison 84.9% opted for the sitting position in obese parturients with 56.9% using the lateral as their second choice. The only positions utilised were sitting and lateral. 94.9% of respondents had not heard of the kneeling position to site labour epidurals.

Conclusion: Each position used for the placement of labour epidurals has its own advantages and disadvantages. With the rising incidence of maternal obesity and its associated risks to not only the mother but also the unborn child, we need to continue in our development and advancement in the provision of good care. We suggest that the kneeling position is a safe and viable alternative for sitting epidural catheters in labouring parturients.

References
**P139 Epidural labour analgesia and risk of instrumental delivery**

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**Introduction:** Epidural analgesia (EA) is a worldwide effective method used for pain relief during labour. Nevertheless, its use and evolution to instrumental vaginal (forceps or vacuum extraction) or operative deliveries remains controversial between experts, either anaesthesiologists or obstetricians. We aimed to analyze the relation between EA and instrumental vaginal deliveries in a sample of our obstetric population.

**Methods:** A retrospective study included all pregnant women who delivered on our labour Room, between 1-January-2011 and 31-December-2012, excluding those who underwent caesarean section. We reviewed the data of demographic characteristics, type of gestation and labour, the use of EA and the newborn APGAR score. Descriptive analysis of variables was used to summarize data and Chi-Square test was used. Multivariate analysis was done with logistic regression, with calculation of corrected Odds Ratio (OR) and its 95% confidence interval (95% CI).

**Results:** 2901 pregnant women were included in this study, with mean age of 29.7 years. 81% underwent EA and 30% instrumental vaginal delivery. 51% were nulliparous. Applying Chi-Square test to independent variables, we obtained significant associations with dystocic delivery for EA, normal maternal age (NMA; 20-35 years) and parity (p<0.001). Applying logistic regression to our model, including parity, NMA and EA with dystocic deliveries, we obtained corrected OR (95%CI) for EA 2.459 (1.884-3.210) and for parity 3.4 (2.867-4.121), with NMA loosing significance. However, this result may still be biased by other factors, such as labour stage at the time of the EA beginning, drugs used in epidural space, use of oxytocin during labour, among others. Additionally we found that, in our population of term pregnancies, NMA and eutocic deliveries, there was no significant relation between EA and APGAR score <8 at the first minute (p=0.079).

**Conclusion:** It's generally assent that EA provides the most effective pain relief in labour. However, it’s associated to prolonged labour and risk of instrumental or caesarean deliveries. Our study has drawn the conclusion that both having EA for labour pain relief and being nulliparous increase the chance of instrumental delivery, respectively in 2.459 and 3.43 times, however without significant impact on newborn APGAR score. Bigger prospective studies correcting for more risk factors are advised.

**References**


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**P140 Estimation of blood loss during caesarean sections - discrepancy between visual and laboratory estimation**

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**Introduction:** Excessive blood loss is a major threat to women undergoing caesarean sections. Accurate visual estimation of blood loss is difficult due to dispersion of blood lost and the blood being mixed with amniotic fluid. Therefore the blood loss often gets under or overestimated. A number of methods exist to estimate the blood loss, the commonly used being: visual estimation by the attending staff, weighing of the blood soaked surgical swabs and calculation based on the pre- and post-operative haemoglobin concentrations. The aim of this audit was to compare the visually estimated blood loss by both the surgeons (vEBLs) and anaesthetists (vEPLa) against the calculated estimated blood loss (cEBL).

**Methods:** Data was collected on thirty five caesarean sections. Operating surgeons and anaesthetists were asked to visually estimate the blood loss in each case. The circulating blood volume was calculated for each patient based on the body weight and height. Then, the blood loss during caesarean section was calculated using the circulating blood volume and the pre- and post-operative haemoglobin concentrations. Correction was made for the haemodilution by intravenous fluid administered.

**Results:** Twenty six complete forms were included in the analysis. None of the patients received blood or blood products intraoperatively. Mean volume of intravenous fluid infused was 1304mL±421. Mean vEBLs, vEBLa and cEBL was 590mL±300, 623mL±372 and 821mL±1004 respectively. The tendency for anaesthetists to give a higher estimate of blood loss was not statistically significant (p=0.12). There was a clear discrepancy between the visual estimate given by both the surgeons and the anaesthetists, the cEBL, however, it did not reach statistical significance (p=0.11 and p=0.14 respectively). Compared to the cEBL the vEBL was overestimated when the blood loss was low (12 cases) and underestimated when the blood loss was higher than 500mL (14 cases). There was a linear relationship between the degree of underestimation and the blood loss, with high levels of blood loss being most underestimated.

**Conclusions:** In this audit, the standard procedure for estimation of blood (visual estimation by the obstetrician) loss was found to be unreliable. We demonstrated a tendency of anaesthetists and surgeons to overestimate the blood loss, if actual blood loss was less than 500mL, and underestimate if the blood loss exceeded 500mL. As a result of the audit, it has been made compulsory in our unit to check haemoglobin concentration in recovery whenever the vEBL exceeds 1000mL.

**References**

P141 Ethnic variations in use of labour analgesia
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Introduction: This retrospective cohort study was compiled to establish the wide variety of nationalities presenting to The Rotunda Hospital for delivery during a one month period and to determine the labour analgesia preferences amongst this population.

Methods: Details of all deliveries occurring during the month of October 2013 were collected. Any patients undergoing elective caesarean section and those with failed inductions were excluded from the study. A demographic of patients’ nationality and ethnic background was compiled. Data relating to these patients’ use of labour analgesia was recorded i.e. epidural uptake, pethidine administration and remifentanil infusion use. We then established the frequency of use of each of these methods of analgesia in each population

Results: There were 767 deliveries in Oct 2013. 104 elective caesarean sections were carried out and there were 8 patients who failed induction.

Therefore a total of 655 patients laboured during this time. This number was made up by 50 different nationalities. Of these 414 patients were Irish, the majority being white but including small numbers of Asian or Black background. Amongst the Irish patients the rate of epidural uptake was 43.47% (234) and the rate of pethidine use was 17.87% (74). Patients of other white background, including many eastern European countries made up 134 of the patients. These patients as a group had a 52.98% epidural uptake rate. Black Africans were found to have a 39.13% (9) uptake rate and those of Asian background had the highest rate at 54.83% (17). The use of pethidine was significantly lower than the rate of epidural in all of these groups. Pethidine was used by 18.19% of Black Africans, 12.9% of Asians and 23.13% in those of other white backgrounds. There were only 3 cases of remifentanil use during the month

Discussion: The highest incidence of epidural uptake during Oct was found to be amongst the Asian population, the lowest being amongst Black Africans. Pethidine use was less than 25% in all groups. The reasons for these trends is unknown though previous studies have suggested that cultural and educational factors may play a part.

A prospective survey of patients post delivery detailing the reasons for their choices of labour analgesia would be worthwhile. Establishing the factors influencing their decisions may allow us to provide an unbiased and fully comprehensive service to ensure patient satisfaction.

P142 Factors associated with the use of spinal anaesthesia for caesarean section in Nigeria
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Introduction: There has been a consistent increase in the rate of spinal anaesthesia for caesarean section in many hospitals worldwide and had been advocated as the preferred technique for caesarean delivery.1 Recent evidence suggests increasing use of spinal anaesthesia for caesarean sections in reports from a teaching hospital.2 The rise in spinal anaesthesia caesarean section notwithstanding, it is pertinent to determine the factors limiting the wholesome application of spinal anaesthesia for caesarean section in Nigeria.

Methods: A snapshot survey was conducted in some selected hospitals in Nigeria. The survey determined the sociodemographic characteristics of patients, indication for surgery, grade of anaesthesia provider, contraindication to spinal anaesthesia and any other factor that may be noticed in the selected hospital. The survey was to be conducted over a 2-week period but was truncated by the nation-wide strike action by doctors after 9 days.

Results: A total of 99 patients were attended to in 4 of the selected 6 hospitals within the study period. 36/99 women were nulliparous and maternal factors (82/99) were the leading indications for caesarean section. Consultant anaesthetists (23/99), Senior Registrars (35/99), Medical Officers (36/99) and others (5/99) provided anaesthesia for the caesarean sections. 85/99 patients received spinal anaesthesia and 14/99 had general anaesthesia for the c-section. Fetal indication for caesarean section had a 3-fold risk of general anaesthesia for the surgery (p = 0.037, RR = 3.1, 95%CI 1.2 – 8). 25/99 and 74/99 were performed as elective or emergency procedure. Nature of caesarean section was not a factor for the use of spinal anaesthesia (p = 0.51, RR = 2.0, 95%CI = 0.5).

Discussion: Over 85% of caesarean sections in Nigeria were conducted under spinal anaesthesia. Fetal indications for caesarean section provoked a 3-fold increase in general anaesthesia for caesarean section. The use of general anaesthesia for caesarean delivery was due to fetal indications for surgery, antepartum haemorrhage and failed spinal anaesthesia. Improved practical conduct of the spinal technique may enhance great application of spinal anaesthesia for caesarean section.

References
P143 Failed intubation for a category 1 caesarean section in a patient with undiagnosed spina bifida

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Introduction: Spina Bifida Occulta (SBO) is part of a spectrum of neural tube defects and is common. We present the case of a patient with previously undiagnosed SBO who required a category 1 caesarean section (CS). Despite an unremarkable airway assessment she had a failed intubation on rapid sequence induction (RSI) and subsequently required an awake fibre optic intubation (AFOI).

Case report: A 37 year old para 0 patient presented to labour ward labouring with a single live foetus at 37 weeks gestation. She was admitted under consultant obstetric care with asymptomatic hypertension. When considering an epidural she was examined and had a vascular naevus, associated with skin tethering, over lumbar vertebrae. She was asymptomatic, had never been investigated, and had no definitive diagnosis of SBO. Airway assessment included a Mallampatti score of 3, but was otherwise unremarkable. An epidural was declined to the patient, with a remifentanil PCA provided instead. A plan was agreed for a RSI GA if operative intervention was required. Several hours later she required a category 1 CS. Initial laryngoscopy with a Macintosh blade yielded a Cormack and Lehane grade 3 view. Manipulation of the cricoid cartilage, long and McCoy blades did not improve the view. Two failed attempts were made to intubate using a bougie. The patient was ventilated using a face mask and a Guedel airway with oxygen saturations above 97% throughout. She was woken up without further incident and an AFOI was performed. Her child was delivered by LSCS without further incident or obvious deficit. The APGAR scores were 8 and 10 at one and five minutes. A grade 3 view was confirmed before the patient was woken. Recovery from anaesthesia was uneventful. The patient was appropriately counselled. An Airway Alert Letter was issued and follow up appointment made. An MRI was carried out subsequently and showed a neural arch defect and dural tethering. Significantly the conus lay as low as L4 with diastematomyelia as far as L2.

Discussion: SBO is common and without prior imaging presents the clinician with a difficult decision. Regional techniques risk neural or dural injury due to a low lying or tethered cord. Abnormal spread of the analgesic agents may give rise to either excessive cranial spread or inadequate caudal spread. This patient population provides further issues for the anaesthetist given the high risk of operative delivery or other intervention (due to pelvic structural abnormalities) and the association of spina bifida with difficult intubation. Patients with spina bifida require careful preop assessment and MRI imaging and careful airway consideration is essential in order to inform anaesthetic planning.

References

P144 Fasting dilemmas: A rare case of a patient with non-ketotic hyperglycaemia presenting for caesarean section

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Introduction: Non-ketotic hyperglycaemia (NKH) is a rare autosomal recessive metabolic disease caused by a defect in the glycine cleavage system. This case report describes the management of a patient who presented for caesarean section. To our knowledge there are no other published case reports of this type.

Case Report: A 32 year old Para 1 presented for elective caesarean section of twins at 37 weeks gestation. She had a history of atypical non-ketotic hyperglycaemia. Following advice from clinical chemistry, during her 6 hours preoperative fast she received an increased dose of sodium benzoate and an intravenous infusion of 10% dextrose at 3mLs/kg/hour which was continued perioperatively. Caesarean section was performed under spinal anaesthesia and twin baby boys were delivered successfully. Post delivery of the second twin she received a bolus of 5 units of syntocinon followed by an infusion at 10 units per hour. Due to uterine atony and an operative blood loss of 1000mLs she also received ergometrine carboprost intramuscularly to good effect. Sodium benzoate was administered orally in recovery and the 10% dextrose infusion was continued until the patient was stabilised on an oral regimen prescribed by the dieticians. This involved a series of high calorie drinks up to every 2 hours for 48 hours. No dietary protein was allowed for 24 hours post delivery. Glycine levels were monitored daily and were raised on day 5 while dietary protein was being gradually reintroduced.

Discussion: NKH has an incidence of 1 in 60,000 with 3 distinct presentations. Classically neonates present with lethargy, hypotonia and seizures. These symptoms can proceed to apnoea requiring ventilation and 30% of patients do not survive the neonatal period. Severe psychomotor retardation is common in those who survive. A second, atypical and very rare form presents with mild baseline hyperglycaemia and intermittent encephalopathy associated with periods of illness. Transient neonatal hyperglycaemia has also been described. Biochemically, NKH is characterized by elevated glycine concentrations in plasma, CSF, and brain with a CSF glycine to plasma glycine ratio greater than 0.08. Standard treatment strategies include protein restriction to reduce exogenous glycine, supplementation of one-carbon pool donors and administration of sodium benzoate. NMDA antagonists have been shown to raise the developmental quotient, improve muscle tone and reduce seizures in these patients.

Prolonged periods of fasting predispose these patients to glycine build up and its toxic neurological effects. This has major implications for the anaesthetist in the perioperative period. This case demonstrates the safe use of regional anaesthesia in conjunction with careful nutritional planning.

References
3. ODM (oesophageal Doppler monitor): guidance
P145 Fetal bradycardia following regional anaesthesia for emergency caesarean section and instrumental delivery: a service evaluation
JK Sidana, K Jadhav-Smith, J Corfe
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Introduction: Fetal heart rate abnormalities, such as late decelerations or fetal bradycardia, are known to occur after neuraxial anaesthesia. These may be due to maternal sympathetic blockade or an increase in the uterine tone caused by intrathecal opioids. The objective of this service evaluation was to evaluate the incidence and management of fetal bradycardia following regional anaesthesia for emergency caesarean section and instrumental deliveries.

Methods: 15 patients with an episode of fetal bradycardia following regional anaesthesia were identified by reviewing the daily obstetric handover sheets from January to December 2011. The medical notes of these patients were reviewed for peripartum obstetric management, cardiocorticographic (CTG) findings, perioperative anaesthetic management and management of fetal bradycardia. Neonatal outcome was assessed by APGAR scores, umbilical cord gases and NICU.

Results: 10 patients had an assisted delivery and 5 had an emergency category-2 LSCS. The peripartum CTG findings were either suspicious or pathological. Timing of fetal bradycardia following regional anaesthesia ranged from 2 to 15 min. 13 patients received spinal anaesthesia and 2 received epidural top up. Maternal haemodynamics stability was maintained with left uterine displacement, intravenous fluids and phenylephrine infusion. One patient had an episode of maternal bradycardia below 50 beats/min which was treated with anticholinergics. Comparing the baseline maternal heart rate with the lowest perioperative heart rate, 3 patients had a greater than 40% drop in the heart rate. 5 patients had a blood pressure drop of more than 20% below the baseline, which was treated with phenylephrine. The highest level of block to temperature was T3. Syntocinon was stopped in all but one case in the event of fetal bradycardia. Significant delays occurred in transferring these patients to theatre after the decision for surgical intervention were taken, maximum 35 min (median 17 min). 6 cases had poor neonatal outcomes with low 5 minute APGAR and abnormal cord gases.

Discussion: We could not find any direct cause which can be solely attributed to regional anaesthesia for the occurrence of fetal bradycardia in these patients. Significant delay in patient transfer to theatre may have a causal relationship but cannot be confirmed. Studies in elective patients have shown that maternal bradycardia causes a drop in maternal cardiac output. Relative maternal bradycardia occurred in several of our cases and this would have led to drop in cardiac output and therefore oxygen delivery. This is most likely a side effect of phenylephrine use. We plan to introduce a care bundle to implement pre-operative and intra-operative fetal resuscitation. This will include steps to improve fetal condition at the time of regional anaesthesia and to ensure adequate maternal cardiac output and oxygen delivery.

References

P146 Further increase in hysterectomy rates - and the reason why
JS Campbell, M Molloy, C Thompson, D Fogarty
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Introduction: RJMS is the tertiary obstetric service for Northern Ireland. As part of a service review of use of uterine artery balloon catheters, we retrieved data from several sources. We found a large proportion of these patients still required hysterectomy. Further interrogation of our data showed some unexpected trends.

Methods: With approval of the Trust’s Data Guardian we used data from several hospital systems, including a local maternity care database and histology records.

Results: We found 30 hysterectomies from 37,088 deliveries in 6 years. This is a rate of 0.8 per 1000 - significantly higher than our prior rates which was near the NICE-quoted rate of up to 3 per 1000. Of these cases, 23 (76%) were due to morbidly adherent placenta.

Not all these cases of morbidly adherent placenta were diagnosed antenatally, which perhaps made hysterectomy more likely since facilities such as intra-arterial balloon catheters could not be available to us in an emergency. Unanticipated cases suffered greater blood loss. Despite no diagnosis, the majority (16/23) were placenta percreta on histology. These percreta cases again had greater blood loss, and were more likely to require ICU care post-operatively. Yet there were no cases of percreta in the 6 years prior, and less than half the number of hysterectomies in that period. This seems to be a dangerous and dramatic change in recent years.

Conclusion: We found a recent and significant increase in peripartum hysterectomy, associated with a large increase in the number and degree of morbidly adherent placenta. Patients with placenta percreta had a greater blood loss, and more commonly required hysterectomy and ICU care.

Reference
P147 Impact of workload on accidental dural puncture (ADP) rate
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Introduction: Post dural puncture headache is an important cause of morbidity. We audit our ADP rates annually against the national standard. Between 2005 and 2008, our ADP rate was stable at approximately 0.5%. However, from 2008 to 2010, our rate rose to above the 1% national standard. Therefore, we audited factors that may have contributed to this increase.

Methods: Information for this audit was obtained from a computerised database. Data collection included day, month and time of ADP and the grade of anaesthetist. We also collected annual data of number of deliveries, epidurals and combined spinal epidurals (CSEs) for labour, caesarean section (CS) data, and the proportion of single shot spinals (SSS) to CSEs performed. Data were analysed using chi-square multinomial and trend tests with P value <0.05 defined as significant.

Results: There was a 40% increase in deliveries between 2008-2010. CSs and regional blocks for analgesia increased by 36% and 40% respectively. Although the ADP rate increased, we could not demonstrate a statistically significant trend due to small numbers. From 2010 to 2012, a non-significant fall in the ADP rate was seen. There was no significant association between ADPs and day, month or time. We did see a significant non-linear trend (P = 0.0012) in the proportions of SSSs to CSEs performed, with the peak occurring in 2010.

Table 1. Trend of activity and ADP rate from 2008 to 2012

<table>
<thead>
<tr>
<th>Maternities (n)</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidurals for labour (n)</td>
<td>1306</td>
<td>1600</td>
<td>1839</td>
<td>2029</td>
<td>2132</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>CSs (n)</td>
<td>1370</td>
<td>1562</td>
<td>1861</td>
<td>1862</td>
<td>1773</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>SSSs for CS (n)</td>
<td>282</td>
<td>274</td>
<td>356</td>
<td>326</td>
<td>347</td>
<td>0.0015</td>
</tr>
<tr>
<td>CSEs for CS (n)</td>
<td>797</td>
<td>644</td>
<td>714</td>
<td>833</td>
<td>915</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Proportion of SSS to CSE (%)</td>
<td>26</td>
<td>30</td>
<td>33</td>
<td>28</td>
<td>27</td>
<td>0.0012</td>
</tr>
<tr>
<td>ADP rate (%)</td>
<td>0.57</td>
<td>0.98</td>
<td>1.05</td>
<td>1.01</td>
<td>0.82</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Discussion: We observed an increase in ADPs until 2010, with significant rises in deliveries and anaesthetic procedures performed. The significant non-linear trend in the proportions of SSSs to CSEs performed for CSs peaked in 2010. A fall in the ADP rate between 2010-2012, occurred despite exposing more women to the risk of ADP, as during this time we performed significantly more CSEs than SSSs proportionally. We believe that the rise in the ADP rate resulted from a significant increase in our workload between 2008 and 2010, without any increase in anaesthetic staffing. From 2010 onwards, daytime anaesthetic consultant sessions increased by 50%, and there was a higher presence on the labour ward out of hours by senior registrars covering non-obstetric theatres. Both factors may have contributed to the subsequent fall in the ADP rate. This audit supports the recent OAA/AAGBI guideline recommending increased anaesthetic staffing on labour ward.

References
Inadvertent hypothermia during elective caesarean sections

S Botros, R Labib, T Ramhew, M Baban, Y Poonawala
Selwyn Crawford Department of Anaesthesia, Birmingham Women’s Hospital, Birmingham, UK

Introduction: The National Institute for Health and Care Excellence (NICE) defines inadvertent perioperative hypothermia as a core body temperature below 36°C. It is a common complication of regional anaesthesia, and is leading cause of perioperative shivering. Hypothermia is associated with increased risk of wound infection and increased blood loss. Shivering can be associated with increased oxygen consumption and hypoxaemia in vulnerable patients. Although the NICE guideline on management of perioperative hypothermia did not cover pregnant women, it has been adopted by many obstetric units. In our unit, intravenous (IV) fluid is not routinely warmed for elective caesarean sections (CS). Hence, we audited our practice to evaluate the incidence of hypothermia.

Methods: Over a three month period, we prospectively audited our practice in 47 women who had elective CS under subarachnoid anaesthesia without active warming. We measured their tympanic temperature prior to anaesthesia (T1) and at the end of surgery (T2). We also collected data that may influence the results like the volume of IV fluid infused, estimated blood loss (EBL) and duration of surgery. We also assessed the incidence of perioperative shivering. We repeated the audit in 42 parturients using an IV fluid warming device. The data were analysed using Microsoft Excel 2007®. Data from both audits were compared and p-values were calculated using unpaired t-test by GraphPad software®.

Results: In the initial audit, 20 patients (42.55%) were hypothermic at the end of surgery (T2 < 36°C). Shivering occurred in 14 patients (29.79%). No correlation was found between T1 and T2 and the IV fluid volume, EBL, duration of surgery or the dose of intrathecal Bupivacaine. In the re-audit, only 3 (7.14%) patients experienced hypothermia. There was no statistical difference in T2 between the two audits (p = 0.781).

<table>
<thead>
<tr>
<th>Initial Audit (n=47)</th>
<th>Re-audit (n=42)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid (ml)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1116.67±369.43</td>
<td>1233.33±483.59</td>
<td>0.2236</td>
</tr>
<tr>
<td>EBL (ml)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>523.75±152.33</td>
<td>582.5±491.67</td>
<td>0.474</td>
</tr>
<tr>
<td>T1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36.84±0.37</td>
<td>38.81±0.37</td>
<td>0.781</td>
</tr>
<tr>
<td>T2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36.08±0.4</td>
<td>36.3±0.29</td>
<td>0.004</td>
</tr>
<tr>
<td>T1-T2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.76±0.34</td>
<td>0.52±0.41</td>
<td>0.0032</td>
</tr>
</tbody>
</table>

Discussion: Our audit highlights the effect of warm IV fluid therapy on reducing the incidence of inadvertent perioperative hypothermia during elective CS. Our audit recommends the routine warming of IV fluid during elective CS. The Enhanced Recovery Partnership Programme considers patient warming as a key factor in accelerating patient recovery. Following our results and as part of developing a new pathway for enhanced recovery post CS; our trust is currently looking to invest in a cost-effective IV fluid warming device.

References
P151 Intra-arterial balloon catheters: A service evaluation
JS Campbell, M Molloy, D Fogarty
Royal-Jubilee Maternity Service, Belfast HSC Trust, Belfast, UK

Introduction: Intra-arterial balloon catheters have become widely used and predominantly accepted in cases where massive haemorrhage is anticipated, especially with morbidity adherent placenta. However, the benefits are still controversial. While our unit is not stand-alone, our building is physically separated from other departments including radiology, so the logistics of balloon catheters are difficult. Our objective was to identify the impact of balloon catheters on management of morbidity adherent placenta. Associated anaesthetic issues include massive transfusion, cell salvage, type of anaesthetic and post-operative care.

Methods: With permission of the Trust’s Data Guardian, we retrieved data from multiple sources to identify and review cases where balloon catheters where used. These included radiology logs, maternity records and histology.

Results: Ten cases were identified via these systems. Seven were for morbidity adherent placenta, of which 5 required hysterectomy despite balloon inflation. Many of these were cases of placenta percreta, despite antenatal diagnosis of accreta. However, blood loss was lower by around 20% (1078ml) using balloons, when compared to other hysterectomies in the same time period.

Other indications were for intra-abdominal pregnancy and persistent post-partum haemorrhage. Another case was abandoned due to logistical reasons (unable to organise theatre time in same building), a decision felt to be open to medicolegal criticism after preparation and planning for balloons.

Limitations particularly reflected the limitations and inconsistency of the systems used, for example no coding in records for morbidity adherent placenta. Local presentation highlighted these problems, which are being taken forward.

Conclusion: Our review, and subsequent MDT discussion, has confirmed the place of intra-arterial balloon catheters within local guidelines for management of morbidity adherent placenta, and other occasional indications. We had decreased blood loss in cases using balloons, but still saw a large proportion requiring hysterectomy.

References

P152 Intrathecal diamorphine for cesarian section following intramuscular diamorphine during labour: a cause for concern?
RC Barr, L Parks
Anaesthetics and Intensive Care, Southern Health and Care Trust, Northern Ireland, UK

Introduction: Diamorphine has largely replaced pethidine for intramuscular (IM) analgesia during labour in our obstetric unit. We also routinely give diamorphine (250-300 micrograms) intrathecally (IT) for cesarian sections. A recent case of meiosis and drowsiness, in a lady presenting for a category 2 cesarian section having received IM diamorphine in labour, highlighted the potential for side effects when diamorphine is used IM and then IT. Should we therefore consider adjusting our IT dose of diamorphine in women presenting for emergency cesarian sections? To our knowledge there are no guidelines on this subject and clinical practice appears variable.

Methods: We conducted a survey of all anaesthetists working in the Southern Health and Social Care Trust who partake in obstetric anaesthesia. Questions focused on; current diamorphine practice, diamorphine dose adjustments, factors influencing our dose decisions and concerns regarding potential side-effects with IT diamorphine.

Results: We received 24 replies; 14 consultants and 10 experienced trainees who regularly perform obstetric anaesthesia. There was a wide variation in diamorphine practice amongst our anaesthetists. The majority (76%) consider reducing their IT dose following IM diamorphine. Factors influencing this dose reduction include timing (88%) and dose (29%) of the last IM diamorphine and clinical signs of toxicity (76%). In particular anaesthetists were concerned about postoperative respiratory depression (94%) and drowsiness (88%), although no one surveyed reported experience of these or other adverse effects associated with IT diamorphine.

Discussion: There is variability regarding the IT diamorphine dose given to women for emergency cesarian section who have already received IM diamorphine in labour. This practice is based on limited evidence. Given the lack of adverse effects reported from our survey and evidence from other specialties where diamorphine is used in higher doses 1,2, we see no reason to routinely reduce the IT diamorphine dose unless there are clinical signs of opiate toxicity. Consideration should be given to prolonged postoperative monitoring of all women who have received both IM and IT diamorphine, especially those in whom the interval between IM and IT diamorphine is short or where there are signs of toxicity.

References
**P153 Introducing self-administration of medication after caesarean section: a Robert The Bruce story**

A R Saiyavan, K Ram, T Yates, Y Chikermane  
Anaesthesia, Heartlands Hospital, Birmingham, UK  

**Introduction:** We were involved in the introduction of the local protocol for self-administration of postoperative medications (SAM) after elective LSCS at a large obstetric unit. In the past, several attempts to implement this have failed. We conducted a pilot study to identify the obstacles and develop ways to overcome the same.  

**Methods:** A pilot was performed to identify methods that would allow successful SAM. Obstetric, anaesthetic, recovery and ward staff were informed beforehand about this pilot by emails and personal discussion. The patients were given information leaflet during preoperative assessment and were informed again on the day of operation. Interested patients enrolled in the pilot with due consent. The self-administration pack contained analgesics and enoxaparin and was dispensed by the recovery staff. Exclusions were: language barrier, patient refusal, lack of capacity and any co-morbidities. Feedback was collected from patients and staff using the standardized proforma during the postoperative visit.  

**Results:** Two of the patients felt that on the first day it was difficult to use SAM due to mobility restrictions. One patient did not receive SAM pack due to communication problem involving midwives and staff. The remaining seven patients were satisfied with SAM. The obstacles we identified in the pilot and also from the past experience and the way we tackled them are as below:

<table>
<thead>
<tr>
<th>Obstacle</th>
<th>Strategy</th>
</tr>
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<tbody>
<tr>
<td>Personal &amp; email reminder</td>
<td></td>
</tr>
<tr>
<td>Promotional posters in clinical areas</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td></td>
</tr>
<tr>
<td>Reminder notices in operating room and recovery</td>
<td></td>
</tr>
<tr>
<td>Meeting with stakeholders (doctors, midwives &amp; pharmacist)</td>
<td></td>
</tr>
<tr>
<td>Involving all staff in guideline preparation</td>
<td></td>
</tr>
<tr>
<td>Staff engagement</td>
<td></td>
</tr>
<tr>
<td>Process simplified and paper work streamlined</td>
<td></td>
</tr>
<tr>
<td>Standardized SAM package and delivery</td>
<td></td>
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<tr>
<td>Guideline</td>
<td></td>
</tr>
<tr>
<td>Fully prepared guideline after extensive consultation</td>
<td></td>
</tr>
<tr>
<td>Time management</td>
<td></td>
</tr>
<tr>
<td>Pre-printed forms to increase efficiency and to avoid time delays and work duplication</td>
<td></td>
</tr>
</tbody>
</table>

**Discussion:** Self-administration of medications after caesarean provides better patient centered care. It improves patient and staff satisfaction, improves clinical efficiency and eases staff workload at hospital and at community level. It empowers the mother in their own care, potentially reduces length of stay, and facilitates seamless flow of care. Although staff and patients liked the concept alike, the process had failed three times before because of certain obstacles. This pilot helped us to highlight the areas we needed to focus on with our new strategies and the results have been encouraging. After fully implementing the project, the uptake is gradually getting better and we continue to audit the outcome.

**References**

2. Change management good practice guideline - NHS Direct

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**P154 Is Remifentanil patient controlled analgesia an effective alternative to epidural for labour analgesia?**

V Betharia, K Peckitt  
Anaesthesia, Stepping Hill Hospital, Stockport, UK  

**Introduction:** Remifentanil patient controlled analgesia (PCA) was introduced for pain relief in labour at our institution in 2007. Since then its demand has steadily increased, gaining favour with midwives and patients due to simplicity of use, effective analgesia and good safety profile. We have standardised protocols for administration and monitoring of Remifentanil PCA and patient controlled epidural analgesia (PCEA) during labour which are strictly adhered to. Aim of our audit was to assess both Remifentanil PCA and epidural PCEA for labour analgesia and make recommendations for improved care of mothers and infants.

**Methods:** This was a prospectively done, questionnaire based audit. Data was collected over 2 months from November 2013 - January 2014. We looked at mode of delivery, cardiotocographic abnormalities, APGAR scores, maternal cardio-respiratory complications, conversion to alternative methods of analgesia and patient satisfaction.

**Results:** There were 610 deliveries during the 2 months. Remifentanil PCA was used in 102 (17%) and epidural PCEA in 85 (12.2%) patients for labour analgesia.  

**Mode of delivery:**

<table>
<thead>
<tr>
<th>Mode of delivery</th>
<th>Normal</th>
<th>Assisted</th>
<th>LSCS</th>
</tr>
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<tbody>
<tr>
<td>Remifentanil PCA</td>
<td>69 (67%)</td>
<td>20 (19.6%)</td>
<td>13 (12.7%)</td>
</tr>
<tr>
<td>Epidural PCEA</td>
<td>29 (34%)</td>
<td>35 (41%)</td>
<td>21 (24.7%)</td>
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</table>

There was a higher incidence of cardiotocographic abnormality in the epidural group (61%) as opposed to Remifentanil group (34%). APGAR scores in both groups were more than 8 at 5 minutes. None of the patients in either group had respiratory depression or cardiovascular instability. Eight (7.8%) patients converted from Remifentanil to epidural due to inadequate analgesia whereas 4 (4.7%) patients in the epidural group used alternative analgesia (3 switched to Remifentanil and 1 to entonox). Patient satisfaction was similar in both groups at 95%.

**Discussion:** From our experience, Remifentanil PCA is a safe and effective method of labour analgesia. We found no evidence of worsening cardiotocography or neonatal outcomes with its use. We also found that patients using Remifentanil have increased rate of vaginal deliveries as compared to those on epidural. While epidural analgesia remains the gold standard and will be preferable in certain groups of patients, Remifentanil PCA is certainly an excellent alternative to consider. In our institution its uptake has steadily increased to approximately 50 patients per month with patients consistently reporting high levels of satisfaction.

**References**

**P155** Is the existing local hospital guideline, 'Management of women who decline blood products', being adhered to?

J Houston, R Burns
Simpson Centre for Reproductive Health, Royal Infirmary of Edinburgh, Edinburgh, UK

**Introduction:** An estimated 150,000 Jehovah's Witnesses (JWs) live in the UK\(^1\). JWs may not accept blood product (BP) transfusion\(^2\), and have up to 130 times increased risk of maternal death from major obstetric haemorrhage\(^3\). This retrospective case note review aims to establish how closely the hospital guideline, 'Management of women who decline blood products' (the Guideline), has been followed since its May 2012 introduction, and to identify areas for improvement.

**Methods:** JWs managed at the Anaesthetic Antenatal Clinic (AAC) since the Guideline's introduction were identified, and their medical records accessed. Information surrounding aspects of patient management addressed by the Guideline was extracted. The findings were then audited against the Guideline to establish how closely it had been followed. Approval was obtained from the Medical School and the Regional Research Ethics Service.

**Results:** Of the patients referred (N=26), 92.3% were reviewed at the AAC, and had management plans created, at 31.0 weeks' gestation on average (Guideline target: 28.0 weeks). 88.5% completed a BP checklist before admission in labour, and 96.2% by time of delivery. 7.7% agreed to accept BPs at clinic and were discharged, so women studied became N=24. BP refusal of 12.5% was not appropriately recorded in the notes, and contrary to the Guideline, serum ferritin was not checked in any woman. During pregnancy, 29.2% were not recorded as having taken iron, and Hb was measured in 95.8%. Excluding elective caesarean sections (CS), Obstetric consultants were documented as informed of admission in 13.6% of cases, and 54.5% of labours and deliveries were reviewed or supervised by senior Obstetric staff (ST6-consultant). 20.8% of total deliveries were by CS; cell salvage was set up in 100.0% of these, and used in 80.0%.

**Discussion:** This study found the Guideline was closely followed in some areas: completion of acceptable BP checklists before delivery, and availability and use of cell salvage in CS compare favourably to previous UK studies\(^1,3\). Areas to be improved include that BP refusal must be appropriately recorded in patient notes to ensure clarity upon presentation in labour or an emergency. It is vital that iron supplementation is commenced early in JWs, and ferritin levels are monitored, to maximise iron stores. In light of this study's findings, hospital blood transfusion Haematologists, in the future, will review JWs antenatally. The Guideline should quantify how often Hb should be monitored, so anaemia can be detected and treated before delivery. Crucially, consultant staff must be documented as informed upon admission of JWs in labour, in order that deliveries can be supervised by senior staff to reduce potential morbidity and mortality.

**References**

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**P156** Klippel-Feil syndrome: management of anticipated difficult airway for caesarean delivery

TM Price, MT Qureshi, ROK Laird
Department of Anaesthesia, Altnagelvin Area Hospital, Derry, UK

**Introduction:** Klippel-Feil syndrome (KFS) is a rare genetic disorder affecting around 1 in 40,000 live births and is characterised by the congenital fusion of any two of the cervical vertebrae\(^4\). In addition to the abnormalities of the cervical spine, patients may have thoracolumbar scoliosis, spina bifida and congenital heart defects. The classical phenotypic presentation is described as low hairline, short neck and limited neck and head movement. These patients can therefore present a considerable challenge to the anaesthetist. The safest method of providing anaesthesia for operative delivery of a parturient with KFS is controversial. We would like to share our experience in managing four elective caesarean deliveries in two parturients using awake oral fibre optic intubation (AOFOI) and general anaesthesia.

**Case Reports:** The first patient had KFS Type II with fusion of cervical vertebrae and underwent elective caesarean deliveries aged 35 and 37 years old. The second patient had KFS Type III with fused cervical vertebrae in conjunction with fusions in the thoracolumbar spine, and underwent elective caesarean deliveries aged 31 and 39 years old. Our patients were both pre-assessed by a consultant anaesthetist at a high-risk pregnancy clinic prior to delivery. This allowed time to discuss the anaesthetic options with each patient and plan for elective or emergency delivery. Both patients had the classical phenotypic features of KFS. Airway assessments revealed Mallampati class 4, thyromental distances less than 6cm and severely limited neck flexion and extension. The trachea was not palpable in either patient. We anticipated difficult direct laryngoscopy in both patients and elected to manage the airway with an AOFOI followed by general anaesthesia. The oral route was chosen as both patients had small nares in keeping with KFS. Sugammadex ensured complete reversal of rocuronium induced neuromuscular blockade and smooth emergence. Caesarean delivery and postoperative recovery was uneventful in all four cases.

**Discussion:** As obstetric anaesthetists we are constantly trying to minimise the risk to our mothers. Klippel-Feil syndrome affects both the airway and the spine, making the choice of anaesthetic technique a difficult decision. Successful use of regional techniques including spinal, epidural and combined spinal-epidural anaesthesia, have all been described in the literature\(^5\). However, we feel that embarking upon a regional technique in patients with distorted neuroaxial anatomy would expose patients to unnecessary risk of high spinal block and/or inadequate regional anaesthesia. Should general anaesthesia be needed intra-operatively, attempting an AOFOI in an already distressed parturient would be challenging. We therefore planned an AOFOI to secure the airway prior to general anaesthesia, in a controlled manner and thus avoid a potentially difficult and emergent intraoperative intubation. In summary, these are difficult cases that we believe benefit from good antenatal planning and can be managed with a planned AOFOI and general anaesthesia.

**Reference**
P157 Labour and delivery in long QT syndrome
BJ Vowles, FMM Bryden
Anaesthetic department, Princess Royal Maternity, Glasgow, UK

Introduction: A 22 year old primigravida presented to the high risk clinic at 22 weeks gestation. She had been diagnosed with long QT syndrome (LQTS) after her family had been investigated following a sudden early cardiac death and was found to be heterozygous for the KCNQ1 gene, responsible for Long QT1. She was under regular review by the cardiologists who had advised β blockade with bisoprolol 2.5mg orally (PO) for 9 months post partum due to an increase in arrhythmia risk during this period. She had also been given a list from Azcert Inc., advising drugs that should be avoided and included on this list was syntocinon.

Labour and delivery: She was admitted in labour at term and the decision was made by the obstetric team, not to administer syntocinon to augment labour. They also felt that epidural analgesia was unsuitable because it would slow the progress of labour. However following an initial dose of intramuscular (IM) diamorphine, the parturient requested epidural analgesia. We felt this would be beneficial for minimising her arrhythmia risk and so she obtained a working epidural with a bilateral T10 block. ECG monitoring was commenced on admission and initially showed bigeminy. A 12 lead ECG demonstrated a QTc of 460ms. Electrolytes checked at this time were in the normal range. Over the subsequent 8 hours she failed to progress and underwent a caesarean section with an effective epidural top up of 20ml 0.5% L-bupivacaine. At delivery syntocinon was administered as a slow infusion of 5 units in 100mls 0.9% saline over 20 minutes, followed by 500µg ergometrine IM to maintain uterine tone. 50mg IM cyclizine and 10mg intravenous (IV) metoclopramide were used for anti-emesis. She was monitored in the Obstetric high dependency unit (HDU) for the following 48 hours, where an initial ECG demonstrated frequent ventricular ectopics, with a QTc 432ms. Electrolytes were again normal at this time.

Discussion: There are many lists of drugs available on the internet with differing advice as to which drugs to avoid in long QT syndrome. The one which our patient had been given clearly stated syntocinon should not be administered, despite no definitive evidence of harm with this drug in patients with LQTS. In addition we found no guidance in published case reports, on oxytocic drugs administered to patients with LQTS in labour or at delivery. There are case reports of ventricular tachycardia after administration of syntocinon in long QT syndrome and one report of a patient receiving it with no sequelae. Ideally the authors feel that this lady merited a case conference prior to admission so that informed decisions could be made. Whilst the outcome of this patient’s labour and delivery may not have been different, a short trial of syntocinon with ECG monitoring may have altered her mode of delivery.

References

P158 Local anaesthetic toxicity audit: are workshops the best educational tool across the MDT?
WITHDRAWN FROM PRESENTATION
JL Lambert, D Chitre, L Evans
Anaesthesia, Southend Hospital, Southend, UK
P159 Lymphangioleiomyomatosis and Pregnancy: A Case Report

M Cole, S Petkov, J Pickett
Anaesthetics, Addenbrookes Hospital, Cambridge, UK

Introduction:
Lymphangioleiomyomatosis (LAM) is a rare condition causing proliferation of smooth muscle in the respiratory system, which can cavitate leading to degradation of lung parenchyma and cystic lung disease. Because of the risk of progression, women with LAM are frequently advised to avoid pregnancy. We present a case of LAM where multidisciplinary management led to a successful outcome of pregnancy, with a focus on anaesthetic considerations.

Case Study:
A 35 year old woman presented with bilateral spontaneous pneumothoraces in the first trimester of her 2nd pregnancy. Both required surgical correction and a lung biopsy revealed a diagnosis of LAM. Computerised tomography of her thorax showed multiple small lung cysts. Past history included an uncomplicated first pregnancy and emergency caesarean section for foetal distress, aged 33; and a spontaneous pneumothorax aged 34, requiring surgery. The patient was referred to a tertiary centre for multidisciplinary management. Care was shared between obstetrics and respiratory medicine and she attended the high risk anaesthetic clinic. Elective caesarean delivery at 38 weeks was agreed upon. She had three further small pneumothoraces, treated conservatively with no marked deterioration in respiratory function. Elective caesarean section was performed at 38/40 gestation.

Discussion: LAM is a rare condition with an estimated UK prevalence of 1 per million. Hypotheses suggest oestrogen accelerates disease progression and pregnancy may result in new diagnosis or exacerbation, therefore obstetric anaesthetists should have awareness of this disease. There is sparse literature for anaesthetic management of pregnancy with LAM, consisting mainly of case reports. Considerations suggested include: avoiding excessive Valsalva manoeuvre via instrumental or elective caesarean delivery, avoid nitrous oxide, early epidural analgesia, obtunding intubation response and lung protective ventilation strategies if general anaesthesia. This case report supports that pregnancy in LAM patients can progress successfully and highlights the importance of a MDT approach, early anaesthetic assessment and a well considered anaesthetic and obstetric plan.

References

P160 Major obstetric bleeds—are we doing the right thing? - A multi-centre study in west midlands

A R Sajayan, M McLoughlin, S Dinesh, A Walunj†, J Karuppuparambil †, M Ravidrin†
Anaesthesia, Heartlands Hospital, Birmingham, UK,
†Anaesthesia, Good Hope Hospital, Sutton Coldfield, UK,
†Anaesthesia, George Eliot Hospital, Nuneaton, UK

Introduction: Guidelines exist on the definitions of massive bleed, the proposed management pathway and the safe time frame for obtaining the blood and products. This multi-centre audit looks at the average time taken for the blood/products to be available in major bleed situations in obstetrics

Aim: To find out the incidence and reasons for delays in issuing the blood/products, if any, from the blood bank and to compare the existing practices and experience with the other hospitals in the area.

Methods: We collected the data from three participating hospitals in west midlands using a standard proforma which included the number of massive obstetric bleed calls during a six months period in 2013, the estimated blood loss, the time taken for the first unit of blood/product to be issued and the number of products used among other data.

Results: The results suggested that there is ambiguity in the way major haemorrhage was defined in different situations which led to unnecessary calls where blood products were not urgently needed. Also, the time for getting the products varied widely the longest being 200 minutes. The documentation of the details of the bleeding, time of calls and time of blood/product administration were incomplete and inaccurate in some cases. In one hospital, major bleed calls were only put out in two out of 17 cases where blood loss was more than 1500 ml.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
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<tbody>
<tr>
<td>Number of MOH calls</td>
<td>58</td>
<td>41</td>
<td>2</td>
</tr>
<tr>
<td>Full data available</td>
<td>13</td>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td>Average time for group specific (min)</td>
<td>59</td>
<td>NA</td>
<td>33</td>
</tr>
<tr>
<td>Average time for X match blood (min)</td>
<td>63.45</td>
<td>42.27</td>
<td>0</td>
</tr>
<tr>
<td>Longest delay (min)</td>
<td>200</td>
<td>104</td>
<td>33</td>
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</table>

Discussion: The definitions of massive blood loss are: Transfusion of a volume equal to the patient’s total blood volume in less than 24 hours / 50% loss of blood volume within 3 hours / rate of blood loss >150 ml/minute. Though the circumstances of individual episodes of major bleed could vary, there was no consistency in the trigger of activating major bleed calls. There were also unacceptable delays in obtaining the first unit of blood in some cases. The first set of uncross matched group specific blood should be available in 20 minutes and cross matched blood in 40 minutes. The study suggest that there is a need for the refinement of major bleeds definition and also a need for a clearer pathway and consistency in issuing blood and products in major bleed situations. This audit results will be used to formulate a uniform policy in the participating hospitals and a re-audit will be done in six month time.

References
2. Guidelines on the management of massive blood loss. BJHaematology 2006; 135(5): 634-641
P161 Management of labour and delivery using minimally invasive FloTrac™ system in a parturient with congenitally corrected transposition, dextrocardia and systemic venricular dysfunction

R Vedagiri SAI, S Dhir, J Racine
Anesthesia, Western University, London Ontario, Canada

Introduction: More women with congenital heart disease now survive to reproductive age due to advances in modern medicine. Obstetric management is challenging in these complex cases. We present the anaesthetic management of labour and delivery in a woman with congenitally corrected transposition of great vessels, dextrocardia, systemic venricular dysfunction and junctional tachycardia using minimally invasive continuous haemodynamic monitoring and optimisation.

Case report: A 28 year old primigavida presented with a diagnosis of congenitally corrected transposition of great vessels and dextrocardia. The atrial septal defect had been repaired in childhood. Her medications included folate and multivitamins. She had good exercise tolerance, stable vital signs and was followed up by Cardiology team throughout her pregnancy. ECHO showed 50% ejection fraction (EF) and mildly reduced systemic (morphologic right) ventricle. A multi-disciplinary meeting between Obstetrics, Cardiology, Anaesthesia and Intensive care unit (ICU) team was held to decide on optimal obstetric management. Induction of labour was planned.

At 37 weeks she developed palpitations, increasing shortness of breath and peripheral oedema. Repeat ECHO showed moderate venricular dysfuncttion with EF 40%, severe systemic atriovenricular regurgitation and severely enlarged left atrium. Prior to labour induction, an arterial line was inserted and continuous cardiac output monitoring was performed using arterial pressure waveform analysis with the FloTrac™ monitor. Haemodynamic optimization was guided by stroke volume variation and goal directed fluid therapy. A lumbar epidural was then inserted followed by rupture of membranes and oxytocin infusion. Fluid balance was closely monitored continuously using FloTrac™. 1st stage of labour was uneventful and 2nd stage was shortened using vacuum assisted delivery of a healthy baby. She had a second degree tear which was repaired. Post partum haemorrhage due to uterine atony was treated with 400μg Misoprostol rectally and intravenous infusion of 20U of Oxytocin. Estimated blood loss was 800 mL. Cardiac condition was stable apart from persistent tachycardia throughout labour. Postpartum, she spent 24 hours in ICU with similar monitoring. Her tachycardia settled spontaneously. She was discharged home on day 4.

Discussion: Patients with congenitally corrected transposition have a thin-walled right venricular as the systemic circulatory pump. The stress of increased cardiac output can cause failure, atriovenricular regurgitation and arrhythmias. We used minimally invasive continuous cardiac output monitoring, fluid balance optimisation and good maternal pain control to prevent dec Compensation and achieve vaginal delivery with a good fetomaternal outcome.

Reference

P162 Management of manual removal of placenta and third and fourth degree tear repair: pathway analysis

P Jegendirabose, J Subramanya*, S Watkinson*, J Short
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Introduction: Guidelines suggest that repair of obstetric anal sphincter injuries (OASIS) and manual removal of retained placenta (MROP) should be undertaken as soon as possible to minimise the risk of infection, blood loss and maternal morbidity.1,2 Anal incontinence and perineal pain can impact significantly on maternal quality of life and mother-child bonding.

Methods: We conducted a retrospective audit which showed shortcomings in our management of MROP and OASIS and we undertook an analysis of a full calendar year’s cases. All cases of MROP and OASIS were identified over January 2012 to December 2012 using both theatre electronic records and maternal records. Time from delivery of fetus to MROP or OASIS repair, blood loss and blood transfusion requirement were reviewed.

Due to lack of nationally set standards, we set a local standard of no more than one hour and twenty minutes from delivery to repair for OASIS.

Results: Our institute is a secondary obstetric centre with 4800 deliveries per annum. During the twelve month period, 105 patients sustained OASIS. The mean delay from delivery to surgery was 136 minutes. The average blood loss was 501 millilitres and 3% of patients required blood transfusion. Total of 42 patients required manual removal of placenta with regional or general anaesthesia. The mean delay from delivery to surgery was 178 minutes. The mean blood loss was 790 millilitres and 5% of the patients required blood transfusion.

<table>
<thead>
<tr>
<th>OASIS repairs n=105</th>
<th>Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery to booking</td>
<td>81 (CI 70-92)</td>
</tr>
<tr>
<td>Booking to surgery</td>
<td>68 (CI 40-95)</td>
</tr>
<tr>
<td>Delivery to surgery</td>
<td>136 (CI 122-150)</td>
</tr>
<tr>
<td>MROP n=42</td>
<td>Time (minutes)</td>
</tr>
<tr>
<td>Delivery to booking</td>
<td>138 (CI 115-160)</td>
</tr>
<tr>
<td>Booking to surgery</td>
<td>39 (CI 32-46)</td>
</tr>
<tr>
<td>Delivery to surgery</td>
<td>178 (CI 152-204)</td>
</tr>
</tbody>
</table>

Incidentally, 78% of the patients did not have electronic record of estimated blood loss on the theatre system.

Discussion: In our institution, these cases are booked onto the general emergency theatre, and not in the designated emergency obstetric theatre. We have identified that this has resulted in significant delay in surgery and increased blood transfusion requirement. We are now changing the patient pathway to include urgent utilisation of the emergency obstetric theatre for these procedures. Since the presentation of this audit, we have included the estimation of blood loss in the surgical sign out process, thus improving communication and patient care.

References
P163 Multidisciplinary involvement of the high risk parturient
S De Silva, P Gregory, E Comber
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Our Hospital offers a high risk Obstetric Anaesthetic Clinic for review of parturients with anticipated Anaesthetic or Medical problems where a checklist referral form is used. We audited whether women were appropriately referred or inappropriately not referred. An alert sticker was created to encourage healthcare providers to alert the oncall Obstetric Anaesthetist when the high risk parturient presented to labour ward. We went onto audit the effectiveness of this alert sticker.

Methods: We looked at 200 consecutive births during October 2010 and ascertained how many of these women had referrals to the High Risk Clinic. In the referred cases, we asked whether referral criteria were met and also determined if any mothers were inappropriately not referred. In 2012 we retrospectively inspected all notes of mothers seen in High Risk Clinic with an estimated delivery date of March to May 2012. We checked whether an alert sticker was present in their notes and also the time taken for the Obstetric Anaesthetist to be contacted once the mother had presented to Labour Ward.

Results: In 2010, 178 of 200 notes were reviewed and 14 women met referral criteria and 12 of these were referred. Fourteen percent were therefore inappropriately not referred, however no women were inappropriately referred.

In 2012, 42 notes were inspected where only 8 had the alert sticker in place, with only 5 in the correct position. Two mothers with the alert had elective caesarean sections. In five of the six remaining mothers, the oncall Anaesthetist was informed of their presence on labour ward. The average time taken for this was four hours and 45 minutes (range 10 minutes to 10 hours and 50 minutes). On review of the Clinic letters, it was felt that 30 of the 42 parturients should have had an alert present in their notes, which is 71% not 19% as shown by our audit.

Discussion: In many cases of substandard care assessed by CMACE, there were major failures of communication between healthcare workers that may have contributed to the woman’s death in some cases. Our audits demonstrated that local guidelines for referral were followed in 99% of cases, therefore high risk mothers were identified early. However, there still lacks effective communication of concerns within teams and poor involvement of other specialties early.

Reference

P164 National Obstetric Anaesthetic Database: a useful tool to benchmark maternity units in the UK
G Keightley, N Tailor, R Baraz, L De Lloyd
Anaesthetics, University Hospital of Wales, Cardiff, UK

Introduction: The National Obstetric Anaesthetic Database (NOAD) was set up in 1998 to establish a framework for collecting national obstetric anaesthetic data considered relevant to obstetric anaesthetists. Whilst preparing the NOAD survey for 2012, we explored the usefulness of this data in benchmarking our units’ performance at the University Hospital of Wales (UHW) in relation to NOAD published figures from the previous year.

Methods: Data was collected according to the NOAD 2012 survey and therefore, ethical approval was not required. Due to the large number of deliveries in our unit, data regarding labour analgesia, mode of delivery, caesarean section rate and type of anaesthesia was based on six months period (Jan to June 2012) and then doubled. Exceptions were critical care admissions and patients with accidental dural puncture (ADP); these were collected and reviewed individually for the entire year. Microsoft Excel was used to analyse the data.

Results: The number of total deliveries in our unit for 2012 was 6138, of which 3060 required anaesthetic procedure(s). The table below compares performance and quality indicators at UHW in 2012 with the NOAD averages from 2011.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>UHW 2012</th>
<th>NOAD 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caesarean section (CS) rate</td>
<td>22%</td>
<td>24.8%</td>
</tr>
<tr>
<td>Elective CS rate</td>
<td>46%</td>
<td>39.1%</td>
</tr>
<tr>
<td>De novo general anaesthesia (GA) for CS</td>
<td>4.5%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Conversion to GA (CS)</td>
<td>1.8%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Labour regional analgesia</td>
<td>27%</td>
<td>22.7%</td>
</tr>
<tr>
<td>Epidural re-site rate</td>
<td>7.7%</td>
<td>9%</td>
</tr>
<tr>
<td>Accidental dural puncture rate</td>
<td>0.9%</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

In 2012, three cases were transferred to critical care unit as level 2 care (two with sepsis and one adult respiratory distress syndrome) and six cases as level 3 care (two with sepsis, three post partum haemorrhage and one case of amniotic fluid embolus).

Discussion: Our unit is classified as a large maternity unit compared to the national average. The elective CS rate and labour regional analgesia rates in our unit are higher than the national average, possibly related to the complexity of a tertiary centre. Despite this, our total CS rate is well below the average with very low conversion to GA. In addition, our epidural re-site rate is lower than the national average, as is our ADP rate. Current facilities include two theatres serving both emergency and elective streams, and a mixed recovery/high dependency unit (HDU) for up to 5 patients. Our unit has a low transfer rate as level 2 care in general HDU, due to the ability to care for these patients on our unit. We find the NOAD data a useful tool to benchmark our performance and set standards of care. More units should contribute to the annual NOAD survey and consider using the data as a way of identifying shortfalls and improving patient care and services.

Reference
P165 Obstetric admissions to the Intensive Care Unit: a 6 year review at a UK tertiary maternity centre

R Labib, K Collis
Selwyn Crawford Department of Anaesthesia, Birmingham Women’s Hospital, Birmingham, UK

Introduction: Maternal mortality has become a rare complication in developed countries. Therefore it can no longer serve as a useful measure of success in obstetric care. Maternal morbidity has been advocated as a better indicator of quality of care.1 Obstetric admissions to the Intensive Care Unit (ICU) and patients’ outcomes can both be useful tools to reflect the quality of obstetric care. Our objectives were to determine the rate, indications and outcomes of our ICU referrals and compare them to the national figures.

Methods: We identified all obstetric patients who were transferred, as an emergency, to ICU between 2007 and 2013. The collected data included: indications for admission, length of stay (LOS), pre-existing disease, the level of organ support, surgical intervention, patients’ outcomes and whether the admissions were antenatal or postnatal.

Results: We had 44 483 deliveries during this six-year period. A total of 2368 (5.32%) women needed HDU care, whilst 53 women (2.24% of HDU admissions) were transferred to ICU. We calculated the incidence of our obstetric ICU admissions as 119 per 100 000 maternities. There were 39 (73.58%) postnatal and 14 (26.42%) antenatal admissions. The total LOS on ICU was 312 days with a median of 3 (2–7) days. The table below shows causes of ICU admissions. Sepsis cases were split between direct and indirect causes according to the source of sepsis. Overall sepsis was the leading cause of ICU transfers (26.42%). Nearly half of the patients (47.17%) needed invasive ventilation and one third (33.96%) required inotropic support. We report no maternal mortality over the six years.

Discussion: Birmingham Women’s Hospital is the largest tertiary obstetric centre in the West Midlands and has four HDU beds on delivery suite. Our incidence of ICU admission is much lower than the national incidence reported by the Intensive Care National Audit and Research Centre (ICNARC) (119 vs 260 per 100 000 maternities),2 despite our complex workload. We feel that this is due to our ability to provide higher levels of care on delivery suite. Our audit highlights the important role of maternal HDU in reducing the rate of obstetric ICU admissions. Our data emphasizes sepsis to be a leading cause of maternal morbidity. Unplanned ICU transfers can be an alternative quality assurance indicator in obstetrics.

References
2. ICNARC. Female admissions (aged 16–50 years) to adult, general critical care units in England, Wales and Northern Ireland, reported as “currently pregnant” or “recently pregnant”. ICNARC, 2009.

P166 Obstetric outcomes with programmed intermittent epidural bolus labour analgesia

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Delivery of epidural analgesia for labour is changing in UK maternity units. A trend towards a patient controlled epidural analgesia (PCEA) has been demonstrated in the National Obstetric Audit Database.1 Previous studies have shown no difference in labour outcomes when comparing midwife-led top-up regimens with PCEA.2 A new delivery method combining programmed intermittent epidural boluses (PIEB) with PCEA has shown a reduced incidence of motor block and instrumental delivery.3 With the recent introduction of PIEB analgesia onto our labour ward, we conducted a service evaluation to investigate obstetric outcomes.

Methods: Following approval from the hospital’s local audit department, data was collected prospectively during July 2013 from parturients who received PIEB analgesia for labour. The protocol was a PIEB of 7mL of 0.1% levobupivacaine with 2mcgogram/mL fentanyl every hour with a PCEA of 6mL of the same solution, available every 20 minutes. Maternal age, gestation and parity was noted and then the mode of delivery documented. Retrospective data was recorded from all parturients who received midwife-led top-up epidural analgesia for labour during the month of October 2012.

Results: Ninety-five mothers received PIEB analgesia with 89 having follow-up data recorded. Midwife-led top-up epidural analgesia was received by 148 mothers, 138 of whom had complete data available. Patient demographic data were similar and there was no significant difference in obstetric outcomes (Table 1).

Table 1:

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Midwife-led top-up</th>
<th>PIEB</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spontaneous vaginal</td>
<td>50/138 (36.2%)</td>
<td>31/89 (34.8%)</td>
<td>0.8876</td>
</tr>
<tr>
<td>Instrumental</td>
<td>46/138 (33.3%)</td>
<td>30/89 (33.7%)</td>
<td>1.0000</td>
</tr>
<tr>
<td>Operative</td>
<td>42/138 (30.4%)</td>
<td>28/89 (31.5%)</td>
<td>0.8839</td>
</tr>
</tbody>
</table>

Data are number (%)

Discussion: Having changed the method of analgesia delivery in our unit, we note that there is no significant difference in obstetric outcomes. The instrumental delivery rate is within acceptable margins, but not as low as demonstrated in recent research. We aim to repeat the project once PIEB is more firmly established in our unit.

References
P167 Osteogenesis imperfecta: a complex anaesthetic case
VG Hamlyn, M Stacey, S Morris
Department of Anaesthetics, University Hospital of Wales, Cardiff, UK

Introduction: Osteogenesis imperfecta (OI) is a rare, potentially fatal, inherited error of collagen production. We present the case of a woman for caesarean section of significant complexity.

Case report: A 25-year-old primip with OI presented at 27 weeks gestation for assessment. The patient gave a history of 40 bony injuries per year, and was wheelchair bound with significant deformities of her spine, limbs and chest. Examination revealed a MPII airway with thyromental distance of less than 6 cm, limited neck extension, poor dentition and inability to lay flat. Preoperative testing revealed a restrictive lung defect (FEV₁ 47%, FVC 46% and FEV₁/FVC 89%). An anaesthetic plan was formulated to include awake fibreoptic intubation followed by caesarean section under general anaesthesia. When planning positioning, the patient was asked to assume various comfortable positions, which were recorded. The patient returned at 31 weeks gestation with worsening dyspnoea, pelvic instability, and a fractured left femur. Investigation revealed a worsening restrictive picture with hypercapnia, so the caesarean section was expedited. The patient was positioned and an awake fibreoptic intubation was performed under fentanyl and midazolam sedation. Following intubation, anaesthesia was induced with benzodiazepine and sevoflurane and was maintained with oxygen/nitrous oxide and sevoflurane. Analgesia was achieved with paracetamol and fentanyl. Due to difficult anatomy a classical caesarean section incision was made, with total blood loss approximating 500ml. Emergence was achieved 75 minutes later and the patient was extubated awake. Post-operative pain was managed using a balanced analgesic regimen, and the patient was independently mobilising within 48 hours. Once mobility was re-established, lateral right thigh numbness was reported.

Discussion: There are few case series of patients with severe OI undergoing caesarean section, especially when complicated by severe physiological compromise. The choice of anaesthetic depends on the individual patient, but in this case regional anaesthesia was precluded. The patient had significant airway and respiratory complications and was unable to lay flat, thus an awake fibreoptic intubation followed by GA was chosen. Following this, small doses of short acting opioids and anaesthetic agents were used to limit post-operative respiratory depression. Despite difficulty with positioning the patient did not sustain any obvious bony fractures perioperatively although she developed meralgia paraesthesia, the aetiology of which remains uncertain. It is important to understand and consider the advantages and complications associated with both regional and general anaesthesia as well as the individual patient’s physiology and anatomy, thus a multidisciplinary approach is vital.

References

P168 Our experience at UHCW: Post-dural puncture headache (PDPH) in a large tertiary teaching hospital.
A Okunuga, S Chaudhari, S Bellam
Anaesthetic Department, UHCW, Coventry, Coventry, UK

Introduction: Post dural puncture headache is a recognised complication of central neuro-axial blockade, which is not only distressing to the patient but can be life threatening. The incidence of PDPH quoted after epidural blockade is 1:100 to 1:200 while after spinal it is 1:500.¹

Methods: We retrospectively reviewed our database for symptoms, signs and the management of all the patients who presented with PDPH from 2009 to 2013. The incidence of PDPH was recorded separately in patients undergoing epidural for labour analgesia and top-up for urgent/emergency LSCS and those that were done under spinal block for LSCS and for procedures such as instrumental delivery, manual removal of placenta, perineal tear repair, cervical circlage.

Results: In our hospital, we have approximately 6200 deliveries and 1300 epidural per year. This gives an epidural uptake rate of about 21%.

Our review demonstrated higher incidence of PDPH (1:160) following spinal for other procedures.

<table>
<thead>
<tr>
<th>Block</th>
<th>Number performed</th>
<th>PDPH (n)</th>
<th>Incidence of PDPH</th>
<th>Conservative management</th>
<th>Epidural blood patch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuroaxial block</td>
<td>10873</td>
<td>57</td>
<td>1:190</td>
<td>21</td>
<td>36</td>
</tr>
<tr>
<td>Labour epidural</td>
<td>5491</td>
<td>40</td>
<td>1:135</td>
<td>11</td>
<td>29</td>
</tr>
<tr>
<td>Spinal for LSCS</td>
<td>4438</td>
<td>11</td>
<td>1:404</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Spinal for other procedures</td>
<td>944</td>
<td>6</td>
<td>1:157</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

Discussion: Our hospital has probably the same pattern of service provision as any other large teaching hospital. Elective caesarean section lists are usually undertaken by either obstetric anaesthetic consultants or advanced obstetric anaesthetic trainees whereas out of hours obstetric anaesthetic services on our labour ward are provided by anaesthetic trainees from specialist trainee year 3 to year 7. It was reassuring to see that the incidence of PDPH following epidural was within the quoted range.

The incidence of PDPH following spinal for other procedures and emergency LSCS were higher when compared to spinal blockade for elective LSCS. The exact cause for this is unknown but this could be explained by possible multiple dural punctures due to technical difficulties under time pressure conditions, less experienced anaesthetists performing the spinal blockade in emergency LSCS and due to the fact that patients undergoing other procedures mobilise earlier. Obstetric anaesthetic services should therefore be provided by more experienced anaesthetists to improve patients safety and maternal satisfaction.

Reference
1. Epidural information card, Obstetric Anaesthetists Association, 2008
P169 Pain relief after Caesarean section: an evaluation of analgesia, prescription and administration.
C C Hullur, A Stronach, Alexandra General Hospital, Redditch, UK

Introduction: Caesarean section (CS) pain relief forms part of our continuous audit of all obstetric anaesthesia interventions. To achieve high standards, >95% satisfaction with analgesia, a concerted and coordinated action amongst service providers is key. We reviewed pain data from 2012 for intrathecal opioid usage, perioperative diclofenac use, patient perception of pain and patient satisfaction with pain relief, and compared this with standards from NICE guidelines as well as those in the RCoA audit recipe book. To give us a clearer picture of reasons for suboptimal pain control, we looked in more detail at both analgesia prescription and administration of analgesics on the ward in a small subset of patients.

Methods: In addition to our routine audit data collection listed above, during November and December 2012 we also collected the following information: prescription of rectal diclofenac, prescription of regular analgesics, dosing of opioids, and administration of regular analgesics on the ward.

Results: 42 audit forms were fully completed and analysed. 17% (7/42) of cases did not receive rectal diclofenac in the immediate postoperative period. In 10% (4/42) of cases the documentation of rectal diclofenac was missing on the drug chart. In 45% of cases, the regular analgesic was not administered. The dosage of opioids for breakthrough pain was inadequate in half the number of patients.

<table>
<thead>
<tr>
<th>Prescription and administration of analgesics</th>
<th>Number of patients /total number, (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-operative rectal diclofenac given</td>
<td>35/42, (84)</td>
</tr>
<tr>
<td>Correct documentation of rectal diclofenac on the chart</td>
<td>38/42, (90)</td>
</tr>
<tr>
<td>Correct opioid doses for breakthrough pain</td>
<td>22/42, (52)</td>
</tr>
<tr>
<td>Administration of regular analgesics as prescribed</td>
<td>23/42, (55)</td>
</tr>
</tbody>
</table>

Discussion: A review of our 2012 CS pain relief data showed 98% compliance with intrathecal opioid administration in spinals, which is in line with RCoA standards, and high patient satisfaction. However, despite evidence for the use of NSAIDs in post-CS pain relief, not all eligible patients receive diclofenac postoperatively. Documentation, which is a legal record, and also prevents under or over dosing, was absent in 10% (4/42) of patients who received rectal diclofenac in the immediate postoperative period. There was also wide variability in doses of opioid prescribed by anaesthetic trainees for breakthrough pain. These were often inadequate, which was disappointing. Some of the reasons for failure to administer regular and adequate analgesia postoperatively included: prescription/dose changes by obstetric trainees, patient refusal, and night dose omitted because patient was comfortable. A standardised obstetric analgesia chart with preprinted correct drug doses, patient education of postoperative pain relief, and staff education on the importance of administration of regular drugs in correct doses are recommendations from this service evaluation.

References
1. Raising the standard: a compendium of audit recipes (3rd edition) 2012 Pain relief after caesarean section (8:11)

P170 Pain relief during labour- information and consent
S Handa, J Andrews*, D Bogod†
Anaesthetics, Nottingham University Hospitals NHS Trust, Nottingham, UK, †Anaesthetics, Nottingham University Hospitals NHS Trust, Nottingham, UK.

Introduction: Informed consent is a process to help decision making and consenting patients must be properly informed. Women differ in their requirements for information about regional analgesia for labour and its complications. Some wish to be informed of all possible complications regardless of the severity or incidence. Anaesthetists are legally obliged to obtain informed consent before performing regional analgesia in labour. They need to be flexible in the amount of information given according to individual patient’s needs.

Methods: Patients coming for induction of labour were given the survey questionnaire to fill in before the process of induction was started. The patients were selected randomly irrespective of the indication for induction of labour. 63 survey forms have been collected to date with the aim of collecting 100 in total. Questions asked included 1) Is this your first baby?, 2) What pain relief options in labour are you aware of?, 3) Where did you get the information?, 4) Are you happy with the information at this stage? The survey questionnaire also included a table explaining all common, uncommon and rare side effects and complications of an epidural and the patients were asked to tick the boxes to indicate the importance of each to make an informed consent.

Results: 48% of patients were primiparous with no previous experience of labour. 100% were aware of Entonox and epidural analgesia, 48% aware of intramuscular injection, 80% aware of TENS and 75% aware of alternative options: aromatherapy. 94% received information about pain relief antenatally; of which 54% from the community midwife, 45% from antenatal classes and 3% from the anaesthetic clinic. 51% were happy with the information while 48% were unsure. 61% would change their mind about having an epidural because of the risk of permanent damage (nerve damage, epidural abscess and haematoma), irrespective of their extremely rare incidence. 91% of patients considered it important (but would not change their mind to have an epidural) to know the risk of prolonged second stage and need for instrumental delivery. 64% thought it was not important to know about common but temporary side effects and complications.

Discussion: Our survey shows expected individual variability in information considered important by each patient about the risks of an epidural. The standard use of OAA epidural information cards in the antenatal and intrapartum period would be a useful tool for expectant women to improve knowledge and make an informed choice.

References
P171 Patient experience following introduction of early discharge for elective caesarean section (CS) in a tertiary centre - a telephone survey.
S Aluri, S Sukumaran*, I Wrench
Anaesthesia, Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, UK, *Gynaecology and Obstetrics, Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, UK

Introduction: There is growing interest in using enhanced recovery following elective caesarean section1. We recently introduced such a programme into our unit resulting in 15-20% of patients being discharged after a single night in hospital. We performed a telephone survey to assess whether earlier discharge was associated with more problems at home.

Methods: Following registration of the project with our clinical effectiveness unit, we interviewed 51 women by telephone in the week following their elective caesarean section. The survey was performed between April and June 2013.

Results:
Table: Results of telephone survey in the first week post elective caesarean section.

<table>
<thead>
<tr>
<th>Day of discharge</th>
<th>Day 1</th>
<th>&gt; Day 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>19 (37%)</td>
<td>32 (63%)</td>
</tr>
<tr>
<td>Baby still in hospital</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Normal activity</td>
<td>19 (100%)</td>
<td>32 (100%)</td>
</tr>
<tr>
<td>Feel back to normal</td>
<td>19 (100%)</td>
<td>30 (94%)</td>
</tr>
<tr>
<td>No pain</td>
<td>17 (90%)</td>
<td>25 (78%)</td>
</tr>
<tr>
<td>Breast feeding</td>
<td>16 (84%)</td>
<td>23 (71%)</td>
</tr>
<tr>
<td>Contacted hospital</td>
<td>Nil</td>
<td>6 (19%)</td>
</tr>
</tbody>
</table>

In total 53% of patients were discharged on day 2. Six patients discharged after day 1 had to contact the hospital. This was either due to baby feeding issues (3 patients) or pain and wound haematoma issues (3 patients). There were no readmissions or problems in patients or neonates discharged on day one and they reported less pain.

Conclusions: Our small survey indicates that there are fewer problems in patients discharged on day one than those leaving hospital later. This may be because only patients with uncomplicated recoveries are being allowed home at this time.

Reference

P172 Perception of labour analgesia amongst third world female scientists
Il Akhideno
Anaesthesia, Irrua Specialist Teaching Hospital, Irrua, Nigeria

Introduction: Female gender empowerment by means of education is associated with improved health seeking behaviours.

Methods: This was a questionnaire based study at the 4th TWOWS (Third World Organization of Women in Science) conference held in Beijing, China. It was distributed to all delegates willing to participate.

Results: One hundred and twenty forms were distributed with only 81 returned. All participants had a minimum of a university first degree in the sciences. The 40-49 age group made up 38.3% followed by 22.2% in the 30–39 age group. Sixty-nine (85.1%) had children while 12 (14.8%) had none. Sixty-four (79%) respondents were aware of labour analgesia options while 17 (21%) were unaware. Of the options known, epidural accounted for 34.4% and intravenous injection, 25%. Of the 74 respondents who had undergone labour, only 27 (36.5%) received analgesia while 63.5% did not. The epidural (37%) and intravenous analgesic (29.6%) were more commonly administered. Two (7.4%) participants documented altered level of consciousness in mother in one case and that of the baby in another. In assessing the need for labour analgesia, 70.4% agreed, 16% disagreed while 13.6% did not know. Those who agreed gave reasons such as maternal comfort and to reduce fear/misconception of labour. The reasons for disagreeing included: a natural process, pain is synonymous with joy of motherhood, causes delays in delivery of the baby, associated with altered consciousness in mother and baby.

Discussion: It was observed that as much as 79% of respondents were aware of labour analgesia options, which suggests that the level of education improved knowledge. This number was irrespective of respondents’ parity. However, this did not translate to actual acceptance as only 36.5% had benefited from labour analgesia. It could be speculated that some of these respondents may not have been as educated as at time of childbearing. In addition, in the past, high maternal mortality rates, HIV/AIDS and poverty overwhelmed issues of maternal comfort in labour coupled with the unavailability of trained anaesthetists in the third world countries contributing to the lack of provision and utilization of labour analgesia services. The reasons adduced for disagreeing are cultural/religious myths/misconceptions which can be changed with adequate education through the media and antenatal clinics.

Conclusion: Female education, commencing at the earliest stages will go a long way in producing parturients who are well educated, empowered and able to make informed choices as regards labour analgesia. This study further shows the need for increased public enlightenment in third world countries for attitudinal change towards labour analgesia.
P173 Post dural puncture headache - the implications of early discharge policies
S K Timalapur, S Young, A Kilpatrick
Anaesthetics, Glasgow Royal Infirmary, Glasgow, UK

Introduction: In parturients receiving epidural anaesthesia, the quoted incidence of accidental dural puncture (ADP) is between 0 - 2.6%, with a subsequent post dural puncture headache (PDPH) rate of between 50 - 80%. Prior to formally adopting enhanced recovery/early discharge policies, we aimed to ascertain how many parturients currently develop “late” PDPH - potentially after hospital discharge in our unit.

Methods: We retrospectively analysed (anonymously) routinely collected outcome data for the calender years 2012 and 2013, for the diagnosis of ADP and/or PDPH looking for the presentation either at day 1 or from day 2 onwards.

Results: 53 patients presented with headache after a regional anaesthetic technique (34 labour epidural, 15 spinal and 4 combined spinal/epidural). 32 (60%) patients presented on day 1 and 21 (40%) presented at day 2 or later. The other characteristics are tabulated below:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age mean (range)</td>
<td>28(17 - 39)</td>
</tr>
<tr>
<td>BMI median (range)</td>
<td>25(19 - 36)</td>
</tr>
<tr>
<td>Regional technique by junior trainees</td>
<td>27 (51%)</td>
</tr>
<tr>
<td>Epidural blood patch</td>
<td>34 (64%)</td>
</tr>
<tr>
<td>Cure after epidural blood patch</td>
<td>22 (64%)</td>
</tr>
<tr>
<td>2nd blood patch</td>
<td>6 (17%)</td>
</tr>
</tbody>
</table>

Conclusion: The incidence of post dural puncture headache after lumbar epidural and spinal in our unit is 1.17% and 0.4% respectively. Some 40% present from day 2 onwards. This suggests, a move towards early discharge will mean higher numbers presenting to the community midwifery service, so robust protocols are needed to ensure that such women with PDPH are identified and referred back to the hospital. Additionally this review is consistent with the finding that blood patching before 48 hours is more likely to fail.

References

P174 Post operative nausea and vomiting after caesarean section
K Draper, G Lilley, A Roberts, M Turner
Dept of Anaesthesia, Royal Gwent Hospital, Newport, UK

Introduction: Post operative nausea and vomiting (PONV) is a well recognised complication of anaesthesia, with an incidence of ~30%.1 Anti-emetic prophylaxis is therefore often given in other surgical specialties, but is less common in obstetric anaesthesia despite a high incidence of PONV and evidence of benefit.2 In our department, anti-emetics were given only to symptomatic patients. We wanted to determine the pattern of use of intra-operative anti-emetics and incidence of PONV following caesarean section (CS). Routine administration of ondansetron as prophylaxis was then introduced, and its impact assessed.

Method: Data was collected prospectively from all patients undergoing CS under general or regional anaesthesia. All patients received neuraxial or intravenous morphine intra-operatively. Patients were interviewed after at least six hours and asked if they had experienced post-operative nausea, vomiting, or required an anti-emetic. A new guideline was then introduced recommending that all patients undergoing CS received 4mg ondansetron following delivery, unless contra-indicated. Subsequently, an impact audit was performed using the same methodology to assess compliance with the guideline and the effect of routine anti-emetic prophylaxis. Approval by the local audit committee was obtained.

Results: In the first phase, 51 patients were interviewed. 61% (31/51) did not receive anti-emetics during the CS, and in this group the PONV rate was 48% with 35% reporting vomiting post-operatively. Following introduction of routine ondansetron, we collected data from a further 56 patients. 93% (52/56) received ondansetron in compliance with the new guideline. The PONV rate in this group was 27% and the vomiting rate was 12%. The relative risk was found to be 0.56 for PONV (95% CI 0.31-0.99, NNT 4.66). The relative risk for vomiting was 0.31 (95% CI 0.13-0.79, NNT 4.18). No adverse effects from ondansetron were observed.

<table>
<thead>
<tr>
<th>Number of cases</th>
<th>Before guideline</th>
<th>After guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>Given ondansetron intra-op</td>
<td>20/51 (39%)</td>
<td>52/56 (93%)</td>
</tr>
<tr>
<td>PONV</td>
<td>22/51 (43%)</td>
<td>14/56 (25%)</td>
</tr>
<tr>
<td>PONV if ondansetron not given</td>
<td>15/31 (48%)</td>
<td>-</td>
</tr>
<tr>
<td>Vomit if ondansetron not given</td>
<td>11/31 (35%)</td>
<td>-</td>
</tr>
<tr>
<td>PONV if ondansetron given</td>
<td>-</td>
<td>14/52 (27%)</td>
</tr>
<tr>
<td>Vomit if ondansetron given</td>
<td>-</td>
<td>6/52 (12%)</td>
</tr>
</tbody>
</table>

Discussion: PONV is an unpleasant experience that can delay nutrition, recovery and discharge after CS. Our results show that a simple pharmacological intervention can reduce its incidence significantly. Ondansetron is in common use throughout pregnancy with a good safety profile.3 With the continued development of enhanced recovery in obstetrics, we would suggest that routine antiemetic prophylaxis with ondansetron is beneficial.

References
P175 Postpartum headache: diversity of management options

N Aldamului, R Morse*
*Department of anaesthesia, Royal Wolverhampton Hospital, Wolverhampton, UK, Department of anaesthesia, St. Mary’s Hospital, Manchester, UK

Introduction: Postpartum headache is very common in the obstetric population with or without neuraxial intervention. It was reported that about 39% of parturients report headache unrelated to dural puncture following delivery. In one study, 12% of women with epidural analgesia but without dural puncture reported headache at two weeks after delivery. Of interest, 15% of women without epidural analgesia reported headache.

The aim of our study was to improve the management pathway for patients with headache by exploring and highlighting the diversity of our current practice, facilitating a move towards a streamlined approach.

Method: Patients admitted to delivery unit over an eighteen month period, recognised to have headache during their routine follow up after neuraxial anaesthesia or analgesia, were audited in retrospect between May 2011 - November 2012.

Results: 23 Patients were recognised to have headache post central neuraxial blockade. Total number of epidurals performed was 1504: 20/1504 (1.32%) developed headache and only 9 of them were recognised to have accidental dural puncture. The rest (3/23) had spinal anaesthetic. 11 patients were readmitted with headache.

Headache management

<table>
<thead>
<tr>
<th></th>
<th>23/23</th>
<th>6/23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral analgesia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caffeine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sumatriptan</td>
<td>3/23</td>
<td></td>
</tr>
<tr>
<td>Epidural blood patch (EBP)</td>
<td>8/23</td>
<td></td>
</tr>
<tr>
<td>Epidural to EBP (range)</td>
<td>29-148 hours</td>
<td></td>
</tr>
<tr>
<td>Neurology referral</td>
<td>4/23</td>
<td></td>
</tr>
<tr>
<td>Imaging (MRI/CT scans)</td>
<td>3/23</td>
<td></td>
</tr>
<tr>
<td>Letters to general practitioners (GP)</td>
<td>3/23</td>
<td></td>
</tr>
<tr>
<td>Anaesthetic clinic follow up</td>
<td>3/23</td>
<td></td>
</tr>
</tbody>
</table>

1 patient had MRI scan to investigate headache 18 months postpartum, with apparent breakdown in communication between the multidisciplinary team members in regards to the initial headache and EBP. 1 patient had intermittent headache for 6 months after epidural insertion despite having epidural blood patch and was referred back to hospital by her GP.

Discussion and Recommendation: Postpartum headache is common. It requires clear guidelines for management, referral and follow up, particularly for patients who have EBP. The evaluation of persistent headache that develops 24 hours after delivery must be performed in a stepwise fashion and requires a multidisciplinary approach. A specific headache work up and follow-up proforma is being devised to facilitate consideration of correct differential diagnosis and the selection of appropriate investigations to reach a reasonable primary diagnosis with more emphasis on improving documentation and discharge letters to general practitioners.

References


P176 Rash decisions

L N Hughes, L De Lloyd*, Y Robson†
Anaesthetics, Royal Glamorgan Hospital, Llantrisant, UK. *Anaesthetics, University Hospital of Wales, Cardiff, UK, †Dermatology, University Hospital of Wales, Cardiff, UK

Introduction: Polymorphic eruption of pregnancy is a common, benign rash associated with term pregnancy. When it spreads to affect skin over the lumbar spine the resulting epidermal disruption is a relative contra-indication for regional anaesthetic techniques. Topical skin treatment for 48 hours may normalise skin and allow regional anaesthesia to proceed safely.

Case Report: A healthy 36 year old primip presented for planned caesarean section at 39 weeks gestation due to tocolphobia. Pre-operatively she was noted to have an extensive maculo-papular rash affecting her limbs and torso. It had been present for 7 days and was very itchy. She was systemically well. The rash was present on her back with no sparing of the lumbar region. Dermatology review was requested and a diagnosis of Polymorphic Eruption of Pregnancy was made. Risk of translocation of bacteria during a regional technique through the abnormal skin was advised to be significant. The patient was counselled regarding the relative contra-indication of regional anaesthesia, and the risks of general anaesthesia, and was advised against proceeding with the caesarean section at this stage. A plan was made to treat the rash with topical clotetasol propionate 0.05% cream, with localised patching over L2/L3 and L3/L4 interspaces, and oral chlorphenamine maleate, with re-assessment after 48 hours. She was discharged home. After 48 hours, skin appearance had normalised under the patched area of the lumbar spine and her planned caesarean section under spinal anaesthesia proceeded uneventfully.

Discussion: Polymorphic eruption of pregnancy is relatively common, particularly in first pregnancies. It usually starts in abdominal striae and can spread across the body, typically sparing the face, palms and soles. Treatment is supportive with topical steroids and oral antihistamines. Improvement is usually rapid following delivery. Histopathologically, polymorphic eruption of pregnancy can cause epidermal spongiosis and parakeratosis with a dermal infiltrate and oedema. Disruption of the skin barrier has been shown to promote skin colonisation by microbes. Our search of the literature revealed a case report of an epidural abscess in a patient with polymorphic eruption of pregnancy, caused by Staphylococcus Aureus. Presence of a rash or disruption of the skin over the site of regional anaesthesia that may harbour infection, either primary or secondary, is a contra-indication to regional anaesthesia. Where there is time to allow diagnosis and treatment of the rash, regional anaesthesia may be performed safely with subsequent normalisation of the skin.

References

P177 Re-audit of epidural request response times in a tertiary obstetric unit

MF Yeoh, K Rosedale, M Scrutton
Obstetric Department, St Michael’s Hospital, Bristol, UK

Introduction: Epidural analgesia is considered as the gold standard for labour analgesia. There have been published guidelines for epidural response times in obstetric units providing 24-hour epidural service.1

Aims: To see if our unit is meeting audit standards of the Royal College of Anaesthetists (RCoA): ≥80% of women should be attended to by an anaesthetist within 30 minutes of requesting labour regional analgesia and 100% should be attended to within 60 minutes.2 Also, to compare our results against previous audit data to identify areas for improvement.

Methodology: Data was prospectively collected on a questionnaire which all anaesthetists were requested to complete. Data collected included: Time of epidural request, time anaesthetist was informed, time of anaesthetic attendance, insertion time, reasons for delay, grade of anaesthetist involved and number and grades of anaesthetists on duty at the time. Audit compliance was monitored by comparing numbers collected to a follow up book.

Results:

<table>
<thead>
<tr>
<th>Epidural Response Rates by Year</th>
<th>2001</th>
<th>2004</th>
<th>2007</th>
<th>2009</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤30 minutes</td>
<td>88%</td>
<td>88%</td>
<td>81%</td>
<td>85%</td>
<td>96%</td>
</tr>
<tr>
<td>≤60 minutes</td>
<td>97%</td>
<td>95%</td>
<td>93%</td>
<td>96%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Over 5 weeks, 47 questionnaires were completed. The range of timings for the midwife to inform the anaesthetist was 0–60 minutes, with a median of 0 minutes. The range of timings to attend was 0–40 minutes, with a median of 5 minutes. The range of epidural insertion times from time of request was 10–80 minutes, with a mean of 31.9 minutes and median of 27 minutes.

Discussion: Our results show that epidural response times have improved from previous years particularly in the ≤30 minute bracket. Causes of delays of anaesthetic attendance included breakdown of communication between midwife and anaesthetist and anaesthetist held up with either sitting another epidural or in theatre. Factors that delayed sitting the epidural after attendance included no intravenous access, coagulation results not available and one parturient was in the bath.

Conclusions: The department met the RCoA audit standards. These figures show improvement from previous years, and reflect good communication and prioritisation of attending to epidural requests within the unit.

References

P178 Recall of information for labour epidural and caesarean section: a questionnaire study

KO Enohumah, M Mrleh
Anaesthetic, Tameside Hospital NHS Foundation Trust, Manchester, UK

Introduction: The legal obligations of anaesthetists concerning consent for labour epidural are guided by guidelines from the AAGBI (1) and the OAA. The body of evidence suggests that women distressed by the pain of labour have capacity to consent to labour epidural. However literature is sparse on postpartum recall of risks of labour epidural discussed during the consent process. We assessed our women’s recall of information discussed during the consent for labour/spinal analgesia.

Method: All patients requesting labour epidural and spinal for elective caesarean section were recruited. The consent process involves a standardised explanation of the procedure and the risks information according to departmental protocol and the OAA guidance/leaflet. A postpartum questionnaire was used to collect information from patients within 24 hours of delivery during their routine follow up.

Results: One-hundred and five women were followed up within 24 hours postpartum. 61 women (58.1%) had spinal for elective caesarean section while 54 women (51.4%) had labour epidural. The majority of the women (57%) stated that anaesthetists were the main source of their information regarding risks of labour epidural/spinal on admission to labour ward. Overall, 96 women (91.4%) recalled at least five risks discussed spontaneously (Fig 1). Of these women recalling at least 5 risks information there was no difference between those who had labour epidural (n=46, 47.9%) and those who had spinal (n=50, 52.0%). Majority of the women (89%) received the risks information leaflet on admission to labour ward. Although majority (92%) of the women were satisfied with the information received overall they want this information early in pregnancy and also in labour ward on admission to hospital.

Discussion: Majority of our women were able to recall spontaneously at least five risks discussed. As with other authors we did not find any difference between those in labour and those who had elective caesarean section. However our finding that most of the women (89%) received labour analgesia leaflets on admission to labour ward has prompted staff education and a call for practice change.

References
2. Information for mothers a publication of Obstetric Anaesthetists Association http://www.oaa-anaes.ac.uk/content.asp?ContentID
Reducing preoperative fasting prior to elective
caesarean section as part of an enhanced recovery
programme

Gl Lilley, M Adamson, M Turner
Anaesthetics, Royal Gwent Hospital, Newport, UK

Introduction: Fasting prior to elective caesarean section is based on a Royal College of Nursing guideline, specifying a minimum of 6 hours from food, and 2 hours from water and other clear fluids (through which newsprint can be read) until induction of anaesthesia. The Enhanced Recovery Partnership by NHS Improvement advocates eating and drinking up to these cut-off times prior to planned caesarean section, and energy drinks 2 hours prior to proposed caesarean section time, with further drinks when this is delayed. Previous audit data from May 2013 in our delivery suite demonstrated a mean fasting period of 12.4 hours (range 10 - 15.5 hours). “Nutricia PreOp” clear carbohydrate drink (100kCal/200ml) was subsequently introduced as part of a new enhanced recovery template for planned caesarean section.

Methods: Patients booked for elective caesarean sections were given 2 “PreOp” drinks at their antenatal anaesthetic review, with verbal and written instructions for them to be consumed prior to 7am on the day of surgery. All patients were interviewed after delivery to establish actual fasting times, intra-operative nausea and vomiting and other adverse events. Following the first audit cycle, the patient information leaflet was revised and posters introduced on the antenatal ward instructing subsequent “PreOp” drink administration for delayed Caesarean section. A second period of data collection was then performed.

Results: A total of 79 patients were included in the audit, all of whom received a regional anaesthetic technique for caesarean section. First audit: A 6 week period (19th August - 30th September 2013) identified 34 patients, of whom 32 took “PreOp” drinks, and 6 patients were given more than the statutory 2 drinks. Mean preoperative fasting time was 4.8 hours (range 1.5 - 12.5 hours). One patient was fasted for less than 2 hours and 2 patients vomited intraoperatively. Re-audit: A second 6 week period (28th October - 9th December 2013) included 35 patients, of whom 33 received “PreOp” drinks, 10 receiving further drinks in preparation for proposed caesarean section later in the day. Mean fasting time was 3.8 hours (range 1 - 14 hours) with 5 patients reporting intraoperative vomiting. One patient was fasted for less than 2 hours. There were no adverse events in any patients.

Discussion: Introducing a preoperative carbohydrate drink as part of an enhanced recovery programme has dramatically reduced preoperative fasting times prior to elective caesarean section. By introducing information for patients and midwives regarding the importance of minimizing excessive starvation periods, fasting times were able to be reduced even further. It is unclear whether reducing fasting time concurs physiological benefit to the patient, but it does form an important component of the enhanced recovery process.

References
2. Enhanced recovery partnership: A better journey for patients and a better deal for the NHS. Available at: http://www.improvement.nhs.uk/documents/er_better_journey.pdf
P181 Schaltenbrand syndrome: a headache for the obstetric anaesthetist.

Caroline Moss, H Gooneratne, M Doraishwami
Anaesthesia, Queen’s Hospital, Romford, UK

Introduction: Spontaneous cerebrospinal fluid (CSF) leak in pregnancy is a rare condition that presents with a postural headache typical of low CSF pressure. We present a case of a woman presenting with headaches typical of CSF leak in early twin pregnancy planning for elective Caesarean delivery.

Case Report: A 28 year old (G1P0) attended the Emergency Department at 9 weeks gestation with severe occipital headaches associated with neck stiffness and vomiting, exacerbated sufficiently by upright posture to limit mobility. Neurological examination including fundoscopy was entirely normal. Initial investigations comprising CT head and lumbar puncture were unremarkable. MRI myelogram revealed a linear cervico-thoracic CSF collection consistent with a spontaneous CSF leak. Symptoms improved spontaneously, before complete resolution 8 weeks after initial presentation. She was referred to the high risk obstetric pre-assessment clinic for anaesthetic review. After discussion of all anaesthetic options, she and her partner expressed a strong wish to avoid general anaesthesia and to proceed with a regional technique. She attended for operative delivery at 38 weeks gestation. A consultant anaesthetist performed a first pass single-shot spinal with a 26G Whitacre needle, with an intrathecal dose of 2.2mls 0.5% hyperbaric bupivacaine with 300mcg diamorphine. Operative delivery proceeded uneventfully, and initial anaesthetic recovery was unremarkable. At 3 month post-natal follow up, she remained well, with no recurrence of her postural headaches.

Discussion: Spontaneous cerebrospinal fluid leak is a rare cause of intracranial hypotension (IH), with a quoted incidence of 5 per 100000 per year, first described by German neurologist Georg Schaltenbrand in 1938. This condition is poorly recognised and underdiagnosed. It is more common in females, and may possibly occur in association with pregnancy secondary to the physiological increase in CSF volume that occurs. Management is similar to that of post-dural puncture headache following regional anaesthesia, including autologous epidural blood patching if conservative measures fail. There is little guidance in current literature on the optimal obstetric and anaesthetic management for either vaginal or surgical delivery. We demonstrate here the safe uncomplicated use of spinal anaesthesia in a parturient electing for Caesarean delivery for twin pregnancy. However this population may have underlying abnormal dural anatomy, posing an unquantified increased risk of complications following neuraxial anaesthesia, necessitating detailed discussion with the parturient before proceeding with regional techniques.

References

P182 Seizure during epidural blood patch

K McDonnell, P Ramasamy, C Elton
Anaesthetic Department, Leicester Royal Infirmary, Leicester, UK

Introduction: We report a patient with a suspected post dural puncture headache (PDPH) who had a tonic clonic seizure during an epidural blood patch.

Case Report: A 28 year old G1P0 had an emergency lower segment caesarean section under spinal anaesthetic. On day 2 post operatively she had no complaints, was discharged, and returned on day 10 with a postural headache that had worsened over the preceding 5 days. She also had photophobia and neck stiffness. Neurological examination was normal and simple analgesics ineffective. A diagnosis of PDPH was made. The following day she underwent an epidural blood patch with 20ml of autologous blood in the left lateral position. On completion of the procedure she complained of a “fullness” in her right ear and immediately had a tonic clonic seizure which resolved spontaneously. Within 30 minutes her GCS was normal but she had residual left face and limb weakness. The CT scan (below) showed a right frontal lobe lesion with 15mm midline shift and early hydrocephalus. She had debulking of a grade 4 glioblastoma multiforme and ongoing chemotherapy. Her neurological symptoms have recovered but she continues to have headaches.

Discussion: This is a late presentation for PDPH where symptoms present typically much earlier. In one large series all post dural puncture headaches presented within 72 hours. Late presentation of PDPH may warrant radiological imaging to exclude other pathology. There are several case reports of seizures as a consequence of PDPH in the absence of other pathology. Cases described where a seizure occurred during the epidural blood patch are rare and often another diagnosis was later discovered.

Reference
P183 Service evaluation for enhanced recovery at the Royal London Hospital
CV Taylor, E Ferreira, S Wray
Anaesthesia, Royal London Hospital, London, UK

Introduction: Enhanced recovery post elective caesarean promises improved service and satisfaction for the patient and significant cost savings. A recent editorial [1] gave suggestions for achieving enhanced recovery by interventions before, during and after delivery. We have used these recommendations to evaluate the service provided at our hospital.

Methods: An audit proforma was completed by the attending anaesthetist for patients undergoing elective caesarean. Data was collected preoperatively and intraoperatively for all patients. Postoperative data was collected only for those considered suitable for enhanced recovery (ASA1 and 2, regional anaesthesia, no surgical complications) Results were analysed using Microsoft excel.

Results: 30 completed forms were analysed over a 2 month period. Of these 26/30 were considered suitable for enhanced recovery. Results are summarised in the table below. Preoperative information was given to the majority of patients. There was poor compliance with fasting guidelines. 13.46 hours was the average for food and 6.98 hours for water. Eating and drinking was re-established after 1.4 hours average for food and 3.3 hours average for water. The majority of patients were discharged on day 1 or 2 postoperatively (22/26).

<table>
<thead>
<tr>
<th>Preoperative</th>
<th>LSCS booklet</th>
<th>29/30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaesthesia option information</td>
<td>25/30</td>
<td></td>
</tr>
<tr>
<td>General information</td>
<td>30/30</td>
<td></td>
</tr>
<tr>
<td>Breastfeeding information</td>
<td>18/30</td>
<td></td>
</tr>
<tr>
<td>Postoperative analgesia information</td>
<td>16/30</td>
<td></td>
</tr>
<tr>
<td>Thromboprophylaxis information</td>
<td>17/30</td>
<td></td>
</tr>
<tr>
<td>Iron supplementation</td>
<td>23/30</td>
<td></td>
</tr>
<tr>
<td>Fasting guideline food (6 hrs)</td>
<td>0/30</td>
<td></td>
</tr>
<tr>
<td>Fasting guideline water (2hrs)</td>
<td>16/30</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intraoperative</th>
<th>Designated elective list</th>
<th>30/30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional anaesthesia</td>
<td>30/30</td>
<td></td>
</tr>
<tr>
<td>Intrathecal opioids</td>
<td>30/30</td>
<td></td>
</tr>
<tr>
<td>Antibiotics</td>
<td>29/30</td>
<td></td>
</tr>
<tr>
<td>Thromboprophylaxis</td>
<td>28/30</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Postoperative</th>
<th>Early cannula removal (&lt;12 hrs)</th>
<th>0/26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early mobilisation(&lt;12 hrs)</td>
<td>7/26</td>
<td></td>
</tr>
<tr>
<td>Early urinary catheter removal(&lt;12 hrs)</td>
<td>6/26</td>
<td></td>
</tr>
<tr>
<td>Regular analgesia</td>
<td>24/26</td>
<td></td>
</tr>
<tr>
<td>Breastfeeding support</td>
<td>17/26</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion: Our service performed well in many areas against the published recommendations and this is reflected in early discharge for the majority of patients. Areas for improvement would be in fasting times, early mobilisation and early removal of IV cannula and urinary catheter.

Reference

P184 Service evaluation regarding the Fluido® rapid infuser and problems encountered with its use.
A Colhoun, I Wrench
Jessop Wing, Royal Hallamshire Hospital, Sheffield, UK

Introduction: The Fluido® rapid infuser is our trust standard for the administration of intravenous fluid during the resuscitation of patients with massive obstetric haemorrhage. Over the last 2 years there have been numerous anecdotal reports of problems during use and a number of critical incident forms submitted, many of these from our obstetric unit.

Method: We surveyed our theatre and anaesthetic staff in all theatre specialties via email link to “Survey Monkey”.

Results: We received 55 (67% anaesthetists, 33% OPD/theatre staff) responses of which only 55% of those asked had received training in using the Fluido® rapid infuser.

| Figure: Proportion of cases where problems were encountered using the Fluido® rapid infuser. |

- With no cases I used it for: 20.5%
- With only a few cases I used it for: 30.5%
- With some cases I used it for: 20.5%
- With most cases I used it for: 7.7%
- With every case I used it for: 7.7%

Discussion: The survey showed that there was widespread concern with the Fluido® rapid infuser across the trust. Those members of staff who were most experienced in using it gave it the lowest rating. These concerns have been reported to the MHRA. We have held discussions with the manufacturers of the device who reported that some of their units have had problems with one of the sensors in the air trap. These sensors have since been changed in the units in our trust.
P185 Spinal after epidural for emergency caesarean section: an audit of rate of conversion from epidural anaesthesia to spinal anaesthesia
K Lake, J Reid, F Henderson
Maternity Unit, Southern General Hospital, Glasgow, UK

Introduction: Epidural top-up for caesarean section (CS) is a long established technique. Some labour epidurals are not fully effective and in these cases conversion to spinal or general anaesthesia (GA) is necessary for emergency CS. Unanticipated changes in anaesthetic technique for caesarean section can lead to morbidity. Indeed in our unit we had three high spinal blocks in three years requiring urgent intubation after conversion from epidural for CS. We therefore aimed to establish the rate of epidural to spinal conversion for emergency CS in 2012 and were able to compare it to similar data collected in 2011.

Methods: All patients with a labour epidural in situ who proceeded to emergency CS were identified from our obstetric anaesthetic database and the mode of anaesthesia was noted.

Results: 316 patients who had an epidural proceeded to emergency caesarean section. The overall rate of conversion from epidural to spinal anaesthesia was 45/316 (14.2%). This has fallen significantly compared with 2011 when the rate was 71/280 (25.4%). Incidentally the GA rate for emergency CS in those with an epidural has not increased but remained consistent at 3.2%.

<table>
<thead>
<tr>
<th>Mode of anaesthesia</th>
<th>2012</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>for emergency caesarean section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in parturients with an epidural</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epidural top-up</td>
<td>261</td>
<td>200</td>
</tr>
<tr>
<td>Epidural abandoned + spinal</td>
<td>36</td>
<td>57</td>
</tr>
<tr>
<td>Epidural top-up failure +spinal</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>Epidural + general anaesthesia</td>
<td>10</td>
<td>9</td>
</tr>
</tbody>
</table>

Discussion: Our figures show there has been a significant reduction in conversion of epidural to spinal anaesthesia for emergency CS (p<0.0031). Performing a spinal after an epidural top-up is highly undesirable and this has also fallen over the audit period. In our unit we have been aiming to improve education around the epidural top-up for new and established trainees with scenario based teaching and practical assessment which may have been instrumental in this improvement. Further data collection and analysis will be required to see if this trend can be maintained.

Reference

P186 Spinal growth impairment following childhood radiotherapy causing a shallow epidural space - a case report
AJ Heck, LA Howie, P Kochhar, K O’Brien, B Brennan*
Anaesthetics, St Mary’s Hospital, Manchester, UK,
*Paediatric Oncology, Royal Manchester Children’s Hospital, Manchester, UK

Introduction: Childhood spinal radiotherapy can result in spinal growth impairment and soft tissue atrophy with consequent adulthood problems. These include short stature, kyphoscoliosis and altered fat deposition. This can lead to technical difficulty during neuraxial procedures.

Case Report: A 38 year old lady (G2P1) had two inadvertent dural punctures with 16g Touhy needles during attempts at establishing epidural analgesia during her second labour. At booking she was 165cm tall, weighed 60kg (BMI 22) and with the exception of migraines, was fit and well. The initial dural puncture was at L3/4. Following a second dural puncture at L4/5 at a depth of 2.5-3cm, an epidural catheter was inserted intrathecally and used for analgesia. She delivered uneventfully. Seven days post delivery she required a blood patch for symptoms of a post dural puncture headache. The epidural space was identified at first attempt by loss of resistance to saline at 2.5cm.

She was evaluated a few days later due to sensory symptoms. Neurological examination was normal but it was noted she had very prominent spinous processes and a pronounced lumbar kyphosis. Neuraxial ultrasound revealed a very shallow epidural space of 2.5cm. On further questioning the patient revealed that at five years of age she had a right nephrectomy followed by subsequent chemotherapy and radiotherapy for treatment of a Wilms’ tumour.

In her first pregnancy twenty-one months earlier she had an uncomplicated epidural placed at a depth of 2cm at L3/4 that worked well for labour and assisted delivery.

Discussion: A Wilms’ tumour is a malignant nephroblastoma of the kidneys that typically occurs in children. Our patient had stage 3 disease treated by nephrectomy, systemic chemotherapy and deep flank radiotherapy which targeted the whole lumbar vertebral bodies at the treatment level.

Flank radiotherapy can affect spinal growth leading to a restriction in height, kyphosis, scoliosis and soft-tissue atrophy but does preserve fertility.1,2 Our patient had a normal height but had a striking deficiency of adipose tissue in a circumferential manner around her abdomen and a prominent kyphosis in the lumbar area.

Consultation of both the previous anaesthetic and hand-held notes would have been desirable for establishing previous experience and depth of epidural placement. A history of childhood spinal radiotherapy should alert the anaesthetist to the possibility of spinal under-development and a remarkably shallow epidural space. Antenatal anaesthetic assessment is essential and neuraxial ultrasound assessment can help define sanoanatomy and guide clinical decision making.

References
P187 Take a deep breath... and breathe: Cricothyroidotomy for airway emergency in obstetric theatre

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Introduction: A can’t intubate, can’t ventilate scenario in obstetric theatre is many anaesthetists’ worst nightmare. We present a case of this and discuss whether our current training adequately prepares us to encounter this situation out-of-hours.

Case Report: A 35-year-old woman (G2P1) at term +7 gestation had a normal vaginal delivery with complete placenta following spontaneous labour. Two hours post delivery she had a significant postpartum haemorrhage managed with uterotonic agents. Nine hours post delivery, and now out-of-hours, she had a further haemorrhage that required urgent examination under anaesthetic for definitive management. A pre-operative review found a slim, healthy woman with a favourable airway assessment. The patient was not fasted and was displaying signs of hypovolaemia with a moderate tachycardia and mild hypotension. Following pre-oxygenation a rapid sequence induction with cricoid pressure was performed by a senior anaesthetic trainee. The initial attempt at intubation was unsuccessful. Two subsequent intubation attempts with patient repositioning, reduction of cricoid pressure, use of a gum elastic bougie and an alternative laryngoscope also failed. Bag-mask ventilation and insertion of a supraglottic airway were ineffective for ventilation and the patient quickly developed hypoxia (SaO₂ < 85%). A can’t intubate, can’t ventilate situation was declared and a surgical cricothyroidotomy successfully performed by the anaesthetic trainee. Once consultant anaesthetic help and an ENT surgeon had arrived, intubation was successfully reattempted by the trainee and the cricothyroidotomy reversed. Surgery proceeded and the haemorrhage controlled with a Rusch balloon.

Discussion: Failed intubation in the obstetric population, despite being more common than the general surgical population is still a rare occurrence. An increase in the use of regional techniques, even in emergency situations, and the impact of the European Working Time Directive on trainee experience mean that exposure of anaesthetists to intubating patients with difficult airways in obstetrics is reduced. This leads to more reliance on algorithms and training courses when dealing with emergency situations. Although evidence that simulation based training improves individual clinical performance is limited, in this case the combination of a mannequin based difficult airway course and simulatiton based training in anaesthetic emergencies and anaesthetic non-technical skills provided the senior trainee involved with invaluable resources when dealing with an unanticipated and potentially life threatening emergency.

References

P188 Team preparation and anaesthesia for EXIT procedure

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Introduction: EXIT is an acronym of Ex-utero intrapartum treatment. It is a uncommon procedure where potential difficult airway in the fetus is diagnosed antenatally and managed at cesarean section by maintaining placental perfusion to support fetal oxygenation. We present a case where a patient had anaesthesia for an EXIT procedure. Written consent was obtained. The report will focus on the detailed planning and team briefing aspects of the case.

Case report: The fetus of a 30 yr old, healthy primiparous woman was found to have a large solid midline tumor involving the jaw and neck and causing airway obstruction. An MDT meeting involving obstetric, obstetric-anesthetic, pediatric-anesthetic, neonatal, paediatric-ENT, midwifery and theatre staff was held prior to the date of the proposed EXIT procedure. Following this, a detailed discussion about the procedure took place with the parents who agreed to proceed with this plan. The EXIT procedure had not been performed previously in our hospital, therefore a further, more detailed, planning meeting was arranged to rehearse the crucial steps and potential difficult scenarios using a high fidelity obstetric simulator. Potential problems were highlighted and addressed. Inadequate space to fit the multiple teams and equipment was identified and therefore the largest theatre in the main theatre complex was selected for the procedure. A floor plan was then drawn up with each team and their equipment being allocated specific space on the plan. There was a restriction on the number of people allowed into the theatre and only essential personnel were allowed in theatre. Photography was carried out by the hospital photographer only.

On the day of operation, the entire preparation culminated in a detailed WHO team briefing and checklist with introductions and description of roles. Each team described their planned steps and any anticipated problems and actions required. Following a rapid sequence induction, general anaesthesia was provided with remifentanil infusion analgesia, which also provided fetal analgesia and immobility. Invasive arterial monitoring and phenylephrine infusion provided tight control of perfusion pressures. Uterine relaxation was achieved with terbutaline and 3 MAC of sevoflurane. After partial delivery of the fetal head and shoulders through the uterine incision, the pediatric anaesthetic and ENT teams secured the airway in 15 minutes. There were no major fetal or maternal complications such as fetal distress or expulsion, or maternal bleeding.

Discussion: Technical and non-technical skills are essential for a team’s success when carrying out complex procedures. A complex case such as the EXIT procedure is a good demonstration of the need for good advance planning and team work. The MDT meetings and simulation, the detailed floor plan and team briefing, and the modified WHO safe surgical checklist were valuable in ensuring a successful outcome.

References
P189 The comparison of the coagulation state of parturients after vaginal delivery and after Caesarean section by thromboelastogram (TEG).

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Background: Pregnancy and surgery, in our case obstetric surgery, have been proven to be independent risk factors for thromboembolic events with reported morbidity and mortality. In both cases changes in coagulation and thrombolysis were frequently observed.

Objectives: To find out if the combined risk factors, namely surgery and pregnancy are more dangerous than each factor alone and to assess if thromboelastography (TEG) is a more sensitive tool than routine coagulation tests to detect coagulation disorders.

Methods: Two groups of sixty parturients were recruited (30 in each): the first group were women to have a vaginal delivery (VD) and in the second group women scheduled for caesarean section (CS). All the parturients in both groups were tested for their coagulation profile immediately after delivery and two more times later. This was accomplished by standard routine coagulation tests and by thromboelastography (TEG).

Results: Statistically significant differences between the groups were found in fibrinogen levels, some components of the TEG (MA and the angle α). Standard coagulation tests showed a same tendency for hypercoagulation in both groups.

Conclusions: The addition of surgery as a risk factor for thromboembolism to normal delivery was proven and so was proven the better sensitivity of TEG to detect the activation of the coagulation system. This is strongly supporting the need for prophylactic measures to avoid thromboembolism when a surgical delivery is planned.

References

P190 The influence of analgesic use during pregnancy on post-caesarean section pain scores

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Introduction: Severe pain after LSCS is known to be common, and this is more effectively controlled by a long acting intrathecal opiate. Less is known about analgesic use in pregnancy, and specifically if such use has an impact on post-LCS pain scores. We aimed to study both in a prospectively recruited cohort of parturients undergoing elective LSCS.

Methods: After ethical approval and consent, pre-operative data and a single 24 hr post-operative pain 10cm VAS collected. We present secondary end points powered post hoc for a 0.8 probability of 3cm VAS difference. A standardised analgesic regime was used. Student’s t-test was used to compare the groups.

Results: 108 patients were included in the study. The prevalence of pre-operative analgesia use was 13/108=12%. 23/108(21%) reported pre-operative pain, usually musculoskeletal. Post-operative VAS data was compared in two groups based on pre-operative analgesia or reports of pain.

Table 1. Demographics

<table>
<thead>
<tr>
<th>No analgesia</th>
<th>Pre-op analgesia</th>
<th>No post-op pain</th>
<th>Post-op pain</th>
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</thead>
<tbody>
<tr>
<td>Age mean (SD)</td>
<td>31.2 (5.41)</td>
<td>31.5 (5.39)</td>
<td>31.1 (5.37)</td>
</tr>
<tr>
<td>Parity median (range)</td>
<td>1(0-2)</td>
<td>1(0-2)</td>
<td>1(0-2)</td>
</tr>
</tbody>
</table>

Table 2. Results

<table>
<thead>
<tr>
<th></th>
<th>Analgesic</th>
<th>No analgesic</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>24hr VAS mean (SD) cm</td>
<td>5.7(2.3)</td>
<td>5.1(2.1)</td>
<td>P=0.38</td>
</tr>
</tbody>
</table>

Discussion: The prevalence of analgesic use during pregnancy is low and pain seems inadequately treated during pregnancy. We found no evidence of an effect on post LSCS pain of pre-operative analgesic use or complaints of pain, though a larger cohort would be required to exclude any small effect.

Reference
P191 The intra-abdominal pressure and the frequency of obstetric and perinatal complications in parturients with obesity - WITHDRAWN FROM PRESENTATION

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P192 The use of remifentanil PCA for labour analgesia
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Introduction: Remifentanil is a potent short acting opiate that is rapidly metabolised in both mother and baby, these properties make it an ideal agent for labour analgesia. The use of remifentanil patient controlled analgesia (PCA) to provide pain relief in labour has become more prevalent over the past 10 years, with many hospitals offering it in cases where epidural analgesia is contraindicated and/or as an alternative to traditional bolus analgesics such as diamorphine and pethidine. To date the optimum dosage and lock-out time has not been established. We conducted a prospective evaluation of the use of remifentanil PCA on our labour ward in a busy district general hospital.

Method: We conducted a prospective evaluation of all patients receiving remifentanil PCA in our labour ward between May 2010 – March 2013. For each patient we recorded demographic details, indication for PCA, mode of delivery, total dose administered, duration of administration, pain scores, sedation score, incidence of nausea and vomiting, physiological parameters and side effects encountered. The data was tabulated and descriptive analysis was undertaken. Spearman’s correlation was calculated for total dose and pain scores.

Results: During the period evaluated 47 women received remifentanil PCA. The median age was 28 years (IQR 22-32 yrs), with 32 (70%) being primiparous. The most common indication for PCA was evidence of sepsis (46.8%), followed by failed epidural (17%) and intrauterine death (14.9%). The majority proceeded to spontaneous vaginal delivery with 34% requiring emergency caesarean section. The median dose delivered was 57ml (27 – 63.8ml) at 40mcg/ml. In the 1st stage of labour the median pain score was 3 (2-5) and in the second stage 4 (2-8), on a 10-point scale. Nausea was reported in 14.9% and all patients remained at least responsive to voice.

Conclusion: Remifentanil PCA is used infrequently on our labour ward with only 47 women receiving it over a period of almost 3 years, however it remains a valuable analgesic alternative when epidural analgesia fails or is contraindicated. It is essential to ensure both anaesthetic and midwifery staff are adequately trained in its use and aware of potential complications. There were no serious adverse outcomes during the period studied.
P193  Trainee experiences of using TAP blocks on labour ward.

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Introduction: After cesarean section (CS) opioids are often required initially to achieve analgesia. However, opioids are associated with dose-dependent side-effects. Techniques that reduce opioid requirements may be of benefit in this population. Transabdominal plane (TAP) block is a regional anaesthetic technique that provides sensory blockade to the anterior and lateral abdominal wall by introducing local anaesthetic into the neurofascial plane between the internal oblique and the transversus abdominis muscles. Recent evidence supports the use of TAP blocks as an analgesic alternative following CS where long acting intrathecal opioids cannot be used as in CS under general anaesthesia (GA), or where opioids are contraindicated, not available or not appropriate for the patient (1,2). Our aim was to gain an insight into the differences in trainee experiences of using TAP blocks on labour ward.

Methods: We conducted a 12-point survey sent electronically to all trainees in the Central London School of Anaesthesia. Questions examined trainees experiences related to the use of TAP blocks on labour ward.

Results: 42 responses were received (21% response rate), 30 of whom were currently working on labour ward. Of those 30, only 33% reported working in a department where TAP blocks were used routinely following GA CS. 53% reported their use sometimes and 30% as never following GA CS (13.7% didn’t know). 60% of trainees had been trained to perform TAP blocks in their current departments. When asked whether trainees performed TAP blocks unsupervised following CS, 6.7% responded ‘always,’ 23% as ‘occasionally,’ 20% responded ‘GA only’, and 50% as ‘never’. Most commonly trainees felt they would need to perform 3 to 4 TAP blocks supervised before feeling competent to perform them alone. Only 7% of trainees were aware of post CS analgesia guidelines within their department. 77% of trainees reported the presence of a dedicated USS on labour ward for use by anaesthetists only. Finally, 77% of trainees would like to have a formal training session on the use of TAP blocks.

Discussion: Despite evidence for the benefit of TAP blocks for CS where long-acting opioids are not used, trainees experiences in their use and teaching seems to vary widely. It appears that training in the use of TAP blocks on labour ward is good, but could be better. Many GA CS are done after working hours on-call only increasing the need for for good quality teaching for trainees to enable them to perform TAP blocks safely and unsupervised to benefit women undergoing GA CS. However, 50% of trainees never perform TAP block unsupervised following CS. This may be due to lack of experience, confidence or due to time constraints when on-call. Most worryingly from this survey was the trainees lack of awareness about guidelines within their departments.

References
2. Elsamian LL. Transversus abdominis plane block reduces postoperative pain intensity and analgesic consumption in elective cesarean delivery under general anaesthesia. Journal of Anaesthesia 2012;26:334-8

P194  Training opportunities for Caesarean Section (CS) under general anaesthesia (GA).

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Introduction: Studies have shown that the number of Caesarean Sections (CS) carried out under general anaesthesia (GA) have reduced significantly in last decade (1,2). Following EWTD, doctors hours were reduced to 48hr per week and as a result, the number of cases done by trainees has declined. To allow adequate number of training opportunities, The RCoA has recommended that 100% of elective CS carried out under GA should be used for teaching (3). The purpose of this audit was to look at how training opportunities of GAs for elective CS were utilised at University Hospitals of Leicester during different phases of EWTD introduction and more recently in 2012.

Methods: Data were collected from Euroking over the following periods: 2004-05, 2007-08, 2009-10 and 2012. Data collected included: total number of GAs, urgency of CS, time of GA and grade of anaesthetist.

Results: The total number of GAs for CS were 189, 222, 191 and 230 in 2004-05, 2007-08, 2009-10 and 2012 periods respectively. The majority of these were emergency CS (166, 194,167,194) which make targeted training by non-resident consultant difficult to achieve. However, a significant number of these (72, 73, 63 and 85) occurred during working hours (i.e. between 08:00 and 18:00 hrs) and hence have the potential to be used for training. Figure 1 demonstrates that in the earlier period of EWTD, for elective CS, consultants and trainees were working independently and therefore many training opportunities were missed whereas more recently in 2012, the number of accompanied GAs has increased significantly (73%).

![Figure 1. Anaesthetists present during elective CS under GA in four periods.](image)

Conclusion: The number of total CS under GA has remained static. The supervised training opportunities during early phase of the introduction of EWTD was low. Recent data is more reassuring as reflected in the number of consultant working together with trainees for elective CS (73%). However we have yet to achieve the recommendation of the RCoA that 100% of elective CS should be used for training.

References
The comparison of the coagulation state of parturients

Perception of labour analgesia amongst third world

Pain relief after Caesarean section: an evaluation of

1. The optimal obstetric and anaesthetic management for either

2. Measures fail. There is little guidance in current literature on

3. The level of education improved knowledge. This

4. The report

5. The presence or absence of a porcine anticoagulant

6. The coagulation was normal, but the prothrombin time

7. The anticoagulant was started, and the haemorrhage

8. The patient received a 300mg soluble aspirin tablet,

9. The anticoagulant was started, and the haemorrhage

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