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Oral Presentations

ESTIMATION OF THE MINIMUM LOCAL ANALGESIC CONCENTRATION (MLAC) OF EPIDURAL LIGNOCAINE HYDROCHLORIDE IN LABOUR

M. O. Columb, G. Lyons, A. Vail
St. James's University Hospital, Leeds, UK

Introduction
There has been a tendency to reduce the concentrations of local analgesics used in labour, particularly in association with other epidural analgesics. To determine the relative potencies of epidural local anaesthetics and to assess the effect of added opioids, we devised a clinical model to estimate the EC\textsubscript{50} of lignocaine in the first stage of labour and termed this MLAC.

Method
After ethical approval, 40 women who requested epidural analgesia at less than 5 cm cervical dilatation and who had not received pethidine were entered into the study. After siting a lumbar epidural catheter a 20 ml bolus of the concentration being tested was given. The concentration administered to a particular patient was determined by the response of the previous patient to a higher or lower concentration using the technique of sequential allocation. Efficacy of analgesia was assessed using 100 mm visual analogue pain scores (VAPS) at 0, 15, 30 and 60 min by a blinded observer. As the EC\textsubscript{50} was to be estimated we decided that we should be exacting and only accept VAPS less than 10 mm as effective. Brownridge has shown that intervention is requested only when VAPS exceeds 30 mm\textsuperscript{1}. Three outcomes were considered:

1. Effective: VAPS less than 10 mm during contractions within 60 min,\textsuperscript{2} decrement for the next patient.
2. Ineffective: VAPS greater than 10 mm due to non-localising pain which responds to 1\% lignocaine, increment for the next patient.
3. Reject: VAPS greater than 10 mm due to localising pain (e.g. segmental, unilateral, perineal) requiring opioids or re-site, repeat concentration for the next patient.

Results
Of 40 entered, 10 were rejected, leaving 30 for analysis which are shown in the Figure.
MLAC of lignocaine in labour is 0.37\% (95\% CI 0.32–0.42) as assessed by UD formula of Dixon and Massey, equivalent to 14 millimolar solution and as a sensitivity test using logit analysis is 0.36\% (95\% CI 0.36–0.41).

Reference
MATERNAL HYPOXAEMIA DURING LABOUR AND DELIVERY: THE INFLUENCE OF ANALGESIA AND EFFECT ON NEONATAL OUTCOME

R. P. Griffin, F. Reynolds
Division of Anaesthetics, United Medical and Dental Schools, St Thomas' Hospital, London UK

Introduction
Painful uterine contractions during labour can cause hyperventilation resulting in hypocarbia. This may induce apnoea between contractions leading to hypoxaemia.1 The aim of this study was to establish the incidence of maternal hypoxaemia in labour. Comparisons were made between different forms of pain relief in a prospective unrandomized trial. An additional aim was to determine whether hypoxaemia of the magnitude that we detected had any effect on neonatal welfare.

Methods
Fifty-one parturients in labour were recruited. All had ≥36 weeks gestation singleton pregnancies and were ASA I or II. Women were retrospectively divided into 4 groups depending on the method of analgesia used: (1) NA: no analgesia; (2) PE: 100 mg pethidine <3 h before the end of the assessed period with Entonox intermittently or continuously; (3) EB: epidural bupivacaine 0.125% infusion or top-ups of 10 ml of 0.25%; (4) EBF: epidural infusion of 0.1% plain bupivacaine with 2 μg ml⁻¹ fentanyl. Maternal oxygen saturation was measured during labour and delivery using a pulse oximeter connected to a toe.

After delivery trend data (consisting of an SpO₂ recording every 12 seconds) were downloaded from the oximeter onto the spreadsheet Excel. The incidence of SpO₂ <94% was calculated in min per h for the last hour of the first stage and the second stage of labour for each parturient. The latter was further divided into passive (early) and active (expulsive) phases. Mean saturation during the second stage was also calculated for each individual. The cardiotocograph (CTG) was monitored throughout labour and any abnormal episodes were recorded. At delivery umbilical cord blood gases were measured and the Apgar scores recorded at 1 and 5 min. The Kruskal-Wallis test was used for non-parametric comparisons between groups.

Results
Table 1. Incidence of SpO₂ <94% for the groups: median (range) min h⁻¹

<table>
<thead>
<tr>
<th>Stage of labour</th>
<th>NA</th>
<th>PE</th>
<th>FR</th>
<th>FRF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last hour of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>first stage†</td>
<td>(0-11.4)</td>
<td>(0-16.4)</td>
<td>(0-0.2)</td>
<td>(0-12)</td>
</tr>
<tr>
<td>(n=7)</td>
<td>(n=11)</td>
<td>(n=11)</td>
<td>(n=12)</td>
<td></td>
</tr>
<tr>
<td>Second stage‡</td>
<td>(0-10.8)</td>
<td>(0-7.7)</td>
<td>(0-0.8)</td>
<td>(0-40.3)</td>
</tr>
<tr>
<td>(n=15)</td>
<td>(n=11)</td>
<td>(n=11)</td>
<td>(n=10)</td>
<td></td>
</tr>
<tr>
<td>Passive phase</td>
<td>0.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>of second stage</td>
<td>(0-4.1)</td>
<td>(0-1.3)</td>
<td>(0-1.5)</td>
<td>(0-35)</td>
</tr>
<tr>
<td>(n=7)</td>
<td>(n=3)</td>
<td>(n=8)</td>
<td>(n=8)</td>
<td></td>
</tr>
<tr>
<td>Active phase</td>
<td>5.5</td>
<td>0.9</td>
<td>0</td>
<td>1.7</td>
</tr>
<tr>
<td>of second stage</td>
<td>(0-12)</td>
<td>(0-5.4)</td>
<td>(0-1.8)</td>
<td>(0-57.6)</td>
</tr>
<tr>
<td>(n=8)</td>
<td>(n=7)</td>
<td>(n=10)</td>
<td>(n=10)</td>
<td></td>
</tr>
</tbody>
</table>

†10 patients excluded because they did not have oximetry monitoring for a full hour or they had only Entonox for analgesia.‡4 patients excluded because they had a caesarean section during the first stage.§21 patients excluded because there was no passive phase or active and passive phases could not be distinguished.
The incidence of SpO₂ < 94% was significantly lower in the EB group than in the PE group (P < 0.001). In the complete second stage and the active phase alone the incidence of SpO₂ < 94% was significantly lower in the EB group than in the EBF group and the NA group (P < 0.05 in all cases).

There were no associations between CTG abnormalities and episodes of maternal hypoxaemia. In 36 cases, neonatal outcome was assessed by umbilical arterial and venous blood gas analysis as well as by Apgar score. Multiple comparisons were made between mean SpO₂, number of min h⁻¹ SpO₂ < 94% and the number of min h⁻¹ SpO₂ ≤ 90% during the second stage, and neonatal outcome measures using Spearman’s coefficient of rank correlation. There were no significant associations.

Conclusions
The low incidence of hypoxaemia in the EB group at all stages may be because effective pain relief prevented hypocarbia-induced hypoventilation. Respiratory depression due to epidural fentanyl may explain why more hypoxemia occurred in the EBF group than in the EB group in the second stage. Incidence of hypoxaemia in the active phase was higher than in the passive phase in the NA, PE and the EBF groups possibly due to breath-holding associated with pushing in the active phase.

There was no evidence that the level of maternal hypoxaemia we detected was detrimental to the fetus.

Reference

A RANDOMISED STUDY OF TRADITIONAL EPIDURAL WITH 0.25% BUPIVACAINE VS COMBINED SPINAL EPIDURAL (MOBILE) TECHNIQUE FOR ANALGESIA IN LABOUR: WHICH DO MOTHERS PREFER?

R. Collis, N. Meares, W. Davies, W. Aveling
Anaesthetic Department, University College London Hospitals, London, UK (Correspondence to WA)

Introduction
The use of a low-dose combination of bupivacaine and fentanyl with a combined spinal epidural (CSE) during labour has been shown to provide rapid reliable analgesia without motor blockade in the majority of women. Ethics committee approval was obtained for a study comparing analgesia, side-effects and overall satisfaction with a traditional epidural or a low-dose CSE.

Methods
Women requesting an epidural in labour who had not received pethidine within 4 h were randomised to 2 groups. (1) CSE: analgesia established with spinal bupivacaine 0.25% 1 ml plus fentanyl 25 μg and continued with 10–15 ml epidural boluses containing bupivacaine 0.1% and fentanyl 2 μg/ml. (2) Bup: epidural established with 10 ml bupivacaine 0.25% continued with 6–10 ml boluses. Analgesia was assessed at 20 min and could be supplemented at any time with extra bupivacaine or fentanyl. Next day a blinded observer interviewed mothers using 100 mm VAS to assess aspects of efficacy and side-effects (0 = best outcome; 100 = worst). Discrete variables were analysed using the χ² test and VAS by the Mann-Whitney U test.

Results
197 women entered the trial and 170 completed post partum questionnaires (CSE 84/98, Bup 86/99) There were no differences in demographic details, mode of delivery or condition of the baby at birth.

<table>
<thead>
<tr>
<th>Assessed outcome</th>
<th>CSE n=98</th>
<th>Bup n=99</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good analgesia at 20 min</td>
<td>92</td>
<td>68</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Ephedrine given</td>
<td>8</td>
<td>4</td>
<td>0.37</td>
</tr>
<tr>
<td>Pruritus (naloxone treatment)</td>
<td>41</td>
<td>41</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Extra analgesia needed</td>
<td>27</td>
<td>34</td>
<td>0.38</td>
</tr>
<tr>
<td>Bupivacaine mg/h (SD)</td>
<td>8.59</td>
<td>17.3</td>
<td>0.003</td>
</tr>
<tr>
<td>Motor block at some time</td>
<td>18</td>
<td>52</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Got out of bed</td>
<td>54</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Happy with mobility</td>
<td>76</td>
<td>26</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Painful rectal pressure</td>
<td>18</td>
<td>15</td>
<td>0.5</td>
</tr>
<tr>
<td>Pain first stage VAS*</td>
<td>5</td>
<td>11</td>
<td>0.002</td>
</tr>
<tr>
<td>Pain at delivery VAS*</td>
<td>(2–16)</td>
<td>(4–27)</td>
<td></td>
</tr>
<tr>
<td>Self control VAS*</td>
<td>(3–68)</td>
<td>(4–53)</td>
<td>0.34</td>
</tr>
<tr>
<td>Satisfaction VAS*</td>
<td>5</td>
<td>15</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>(2–13)</td>
<td>(4–36)</td>
<td></td>
</tr>
</tbody>
</table>

*Median (interquartile range).
Conclusion

Both methods gave high overall satisfaction. Control of pain was more rapid with low-dose CSE and the mobility associated with less motor block was popular. Overall satisfaction and self control were significantly better in the CSE group. Mode of delivery and fetal condition were no different in the 2 groups.

SUBARACHNOID DIAMORPHINE COMPARED WITH EXTRADURAL DIAMORPHINE FOR POSTOPERATIVE PAIN RELIEF FOLLOWING ELECTIVE CAESAREAN SECTION

W. F. Eskander, P. B. Harvey, I. G. Kestin
Department of Anaesthesia, Derriford Hospital, Plymouth, UK

In a double-blinded study, we have investigated the differences between extradural and intrathecal diamorphine in patients having elective caesarean section under regional anaesthesia.

Methods

The Ethics Committee approved the trial. Thirty-five patients ASA I or II requesting regional anaesthesia for elective caesarean sections gave written informed consent.

All patients had a combined spinal/epidural technique and were allocated randomly into 2 groups. Patients in group A were given 0.75 mg of intrathecal diamorphine in 0.75 ml of saline and 2.5 ml of 0.5% hyperbaric bupivacaine. Patients in group B were given 0.75 ml of intrathecal saline and 2.5 ml of 0.5% hyperbaric bupivacaine. An epidural catheter was then threaded for 3 cm and left in the epidural space. Surgery started once the block was higher than T12. Thirty minutes after the subarachnoid injection, patients in group A were given 10 ml of saline through the epidural catheter, and patients in group B were given 3.3 mg of epidural diamorphine in 10 ml saline.

All patients received a 100 mg diclofenac suppository at the end of the operation. Postoperative pain was assessed hourly for 24 h by the patient using a visual analogue scale (VAS), and the time to the first request for analgesia was noted. Sedation was measured using the critical flicker fusion threshold and a mental arithmetic test. Nausea and pruritus were assessed hourly for 4 h after surgery by the patient as none, mild, moderate or severe. The results were analysed by t-test, χ² test, Mann Whitney U-test, and ANOVA and the level of statistical significance was 5%.

Results

Seventeen patients were given extradural diamorphine and 18 patients received intrathecal diamorphine. Patients in each group were of similar age and weight.

There was a statistically significant difference in the analgesia. The mean duration of analgesia for the spinal diamorphine group was 20.8 h (range = 6–24), and 16.2 h in the epidural diamorphine group, (range = 2.5–24) (Table). 11% of the patients who had spinal diamorphine required an intramuscular injection of opioid during the first 24 h, compared with 35% of the patients who had epidural diamorphine (Table). The patients who received intrathecal diamorphine had significantly lower VAS pain scores on 4 occasions after the surgery.

There was a significantly higher incidence of pruritus after spinal diamorphine. 72% of those who received intrathecal diamorphine had pruritus, and 31% of these patients described the pruritus as severe; 35% of the patients who received epidural diamorphine developed pruritus, but none described it as severe. None of the patients required any treatment for the pruritus.

There was no respiratory depression and no evidence of sedation, both compared with baseline and between the two treatments. There was no difference in the incidence of nausea and vomiting between the two treatments (Table).

Discussion

We have shown that intrathecal diamorphine produces better pain relief after caesarean section than epidural diamorphine, but there is an increased incidence of pruritus.

| Table. Analgesia and side-effects of intrathecal diamorphine (IT.D.) compared with extradural diamorphine (EX.D.) |
|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Mean duration of analgesia (h) | I.M. opioid necessary in the first 24 h | Pruritus (n=18) | Nausea (n=18) | Vomiting (n=18) |
|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| IT.D. 20.8 (n=18) | 2 (11%) | 13 (72%) | 6 (33%) | 1 (6%) |
| EX.D. 16.2 (n=17) | 6 (35%) | 6 (35%) | 6 (35%) | 1 (5%) |

Reference

NEUROBEHAVIOURAL CHANGES IN NEONATES AFTER AMBULATORY COMBINED SPINAL EPIDURAL (CSE) ANALGESIA DURING LABOUR

R. Fernando, P. Gill, J. Urquhart, B. M. Morgan
Institute of Obstetrics and Gynaecology, Queen Charlotte's Hospital, London, UK

Introduction

Neurobehavioural scoring systems such as the Neurologic and Adaptive Capacity Score (NACS)\(^1\) have been used to show alterations in neurologic and behavioural function despite normal Apgar scores and cord blood gases. In order to establish the safety and potential benefits of ambulatory CSE during labour,\(^2\) we have evaluated NACS in the babies of mothers who have walked during labour.

Method

Consenting nulliparous women receiving a CSE were randomly allocated to either staying in bed for the rest of their labour or spending as much time as possible out of bed. Those who got out of bed were asked to sit in a rocking chair, stand by the bed or walk about. All mothers with a CSE received a spinal injection of bupivacaine 2.5 mg and fentanyl 25 μg using a 27 gauge, 119 mm Becton-Dickinson Whitacre spinal needle. This was followed by epidural top-ups of 10 mg bupivacaine in 10 ml with 2 μg/ml of fentanyl. Neonatal condition was assessed using Apgar scores, umbilical cord blood gases and NACS at 2 and 24 h after delivery.

Results

Forty women were recruited into the study. Twenty were randomly assigned to stay in bed and 20 were assigned to be ambulant during labour. The results are shown in Tables 1 and 2.

Conclusion

No statistically significant differences were found in terms of Apgar scores, cord blood gases or NACS between the ambulation and lying groups. Walking during labour appears to be safe in terms of neonatal condition, but confers no benefit.

Table 1.

<table>
<thead>
<tr>
<th>Group</th>
<th>Number with Apgar score &lt; 7 at 1 min</th>
<th>Number with Apgar score &lt; 7 at 5 min</th>
<th>Cord pH arterial mean (SEM)</th>
<th>Cord pH Venous mean (SEM)</th>
<th>NACS at 2 h mean (SEM)</th>
<th>NACS at 24 h mean (SEM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambulation</td>
<td>2</td>
<td>0</td>
<td>7.23 (0.01)</td>
<td>7.30 (0.01)</td>
<td>37.1 (0.86)</td>
<td>39.6 (0.20)</td>
</tr>
<tr>
<td>Bed</td>
<td>2</td>
<td>0</td>
<td>7.20 (0.02)</td>
<td>7.29 (0.02)</td>
<td>37.1 (0.77)</td>
<td>39.7 (0.21)</td>
</tr>
</tbody>
</table>

Table 2.

<table>
<thead>
<tr>
<th>NACS at 2 h mean (SEM)</th>
<th>Adaptive capacity</th>
<th>Passive tone</th>
<th>Active tone</th>
<th>Primary reflex</th>
<th>Overall assessment</th>
<th>Total NACS 2 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambulation</td>
<td>9.0 (0.37)</td>
<td>7.6 (0.17)</td>
<td>9.3 (0.28)</td>
<td>5.4 (0.20)</td>
<td>6.0 (0.10)</td>
<td>37.1 (0.86)</td>
</tr>
<tr>
<td>Bed</td>
<td>9.4 (0.21)</td>
<td>7.8 (0.21)</td>
<td>8.7 (0.47)</td>
<td>5.5 (0.20)</td>
<td>5.9 (0.05)</td>
<td>37.1 (0.77)</td>
</tr>
</tbody>
</table>

MOTOR BLOCK DURING EPIDURAL INFUSIONS FOR NULLIPAROUS WOMEN IN LABOUR

A randomized double blind comparison of 0.125% bupivacaine and 0.0625% bupivacaine with 2.5μg/ml fentanyl

R. Russell, J. Quinlan, F. Reynolds
Department of Anaesthesia, St Thomas' Hospital, London, UK

Introduction

Progressive motor block results from increasing doses of epidural local anaesthetic. This may reduce spontaneous deliveries and maternal satisfaction and increase long-term backache.\(^1\) The addition of fentanyl permits reduced local anaesthetic dose and, when given as a bolus, relieves perineal pain more reliably than plain bupivacaine.\(^2\) We studied analgesia, motor block and delivery type during two different epidural infusions.
Methods

Sixty nulliparous women were randomized to receive an epidural infusion of either 0.125% plain bupivacaine or 0.0625% bupivacaine with 2.5 μg/ml fentanyl, both starting at 12 ml/h. The infusion was titrated to maintain a sensory level T8-T10 and top-ups of 0.25% plain bupivacaine were given for inadequate analgesia. Pain was assessed on a verbal numerical scale and its site noted. Motor block was scored on a modified Bromage scale and on the RAM test. Maternal side-effects and cardiotocograph abnormalities were documented. Neonates were assessed by Apgar scores at 1 and 5 min, umbilical arterial and venous pH and NACS at 2 and 24 h. Mothers were seen postnatally and asked to score their satisfaction with first and second stage analgesia and with labour overall.

Results

There were no significant differences in age, body mass index, gestation, cervical dilatation, onset, augmentation or length of labour. Motor block was significantly more common and severe in the 0.125% bupivacaine group (P<0.01) (Fig.). The quality of analgesia was similar in the 2 groups with 87% in the 0.125% bupivacaine group and 77% in the 0.0625% group requiring 1 or 0 additional top-ups. The incidence of perineal pain and pain at delivery was similar in the 2 groups. The spontaneous delivery rate was higher in the 0.0625% bupivacaine group (47% vs. 37%) but not statistically significant. To maintain a sensory level of T8-T10 an increased bupivacaine dosage of 0.4 mg h⁻² in the 0.125% group and 0.6 mg h⁻² in the 0.0625% group was required. Neonatal outcome and maternal satisfaction was similar in the 2 groups.

Conclusions

The incidence of motor block increased with the use of 0.125% plain bupivacaine which produced significantly more motor block. However, with the small sample size we were unable to demonstrate an increase in spontaneous deliveries or maternal satisfaction. Perineal pain was not reduced by the addition of fentanyl to the infusion.

References


Poster Presentations


A. R. Maclean, G. Lyons, M. Dresner
St James University Hospital, Leeds, UK

Introduction

Post dural puncture headache (PDPH) is a common postoperative complication of spinal anaesthesia.

Pregnant women have the highest risk of PDPH with an incidence ranging from 0.7-20%. It is claimed that the use of pencil point needles reduces this rate. Other investigators have been unable to prove this. A study comparing Quincke point needles concluded that the 27 gauge was the most appropriate to compare with the pencil point needles.

Method

After ethical approval, 600 patients, scheduled to have a caesarean section under combined spinal/
epidural anaesthetic, were randomised to a 27 gauge Quincke, 25 gauge Whitacre or 24 gauge Sprotte needle. Established clinical procedures were followed. Observations included failure rate, incidence of headache and blood patch. The results were analysed using the $\chi^2$ and Fisher Exact tests.

<table>
<thead>
<tr>
<th>Needle</th>
<th>n</th>
<th>Headache n (%)</th>
<th>Patch n (%)</th>
<th>Failure n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 gauge Sprotte</td>
<td>200</td>
<td>24 (12.0)</td>
<td>11 (5.5)</td>
<td>10 (5)</td>
</tr>
<tr>
<td>25 gauge Whitacre</td>
<td>200</td>
<td>33 (16.5)</td>
<td>11 (5.5)</td>
<td>15 (7.5)</td>
</tr>
<tr>
<td>27 gauge Quincke</td>
<td>200</td>
<td>35 (17.5)</td>
<td>13 (6.5)</td>
<td>9 (4.5)</td>
</tr>
</tbody>
</table>

Conclusions

No statistically significant difference between the needles could be found for headache, patch or failure rate. Analysis of our study suggests that to find a significant difference, with a power of 0.8, we would require more than 1000 patients in each group. It is unlikely that there is any clinically important difference in the need for blood patching between the needles. There was no evidence of a greater failure rate with the Sprotte needle compared to the Whitacre. This suggests that the larger side hole of the Sprotte needle is not the problem that other authors have implied.7

References


LABOUR ANALGESIA – CAN PROSPECTIVE MOTHERS PREDICT THEIR NEEDS?

G. C. Fletcher, S. A. Beck, T. A. Goudie
Anaesthetic Department, Royal Alexandra Hospital, Paisley, Scotland, UK

Introduction

An increasingly consumerist approach to healthcare is becoming evident among patients resulting in their increased participation in decisions regarding treatment. In obstetric practice this often involves explicit forward planning of labour analgesia.

This study aimed to determine how able prospective mothers are to predict what analgesia they will require during labour and to evaluate what factors affect their ability to do so. Whether their ability to assess accurately their analgesic requirements affected satisfaction with their labour, which might lead to disappointment and self-recrimination, was also determined.

Methods

478 women were studied. All, when asked in early labour, were able to express a preference for no analgesia, Entonox, intramuscular pethidine or epidural analgesia in the management of their anticipated labour pain. Analgesics subsequently received and other relevant details pertaining to the labour were recorded during labour or obtained, by interviewing the mothers, postnatally.

Results

55% of mothers underestimated their subsequent analgesic requirements, 10% overestimated them, and the remaining 35% received the analgesic they had planned to have. Epidural analgesia proved to be an appropriate choice more often ($P<0.01$) than each of the other 3 alternatives, which were not significantly different from each other.

Multivariate analysis showed the best predictors (in descending order) of the planned analgesia being an underestimate of subsequent requirements to be: complicated labour; planned analgesia not being an epidural; pain (after all analgesia was given) being greater than that anticipated; long duration of labour; the woman being a primigravida. Confidence in the adequacy of the planned analgesia (before it was needed), previous experience of the planned analgesia, attendance at parentcraft classes and pain score (after all analgesia was given) were not shown to have a significant effect.

Whether the planned analgesia proved to be appropriate did not affect how satisfied mothers were with their labour. They were significantly less satisfied
if their labour was complicated or of long duration, pain (after all analgesia was given) was greater than that anticipated and if pain scores (after all analgesia was given) were high.

Conclusion
Prospective mothers tended to underestimate their analgesic requirements in labour. Their planned analgesia not proving to be adequate did not, however, result in an increased likelihood of dissatisfaction with their labour.

DO TED (THROMBO-EMBOLIC DETERRENT) STOCKINGS PREVENT OR ATTENUATE HYPOTENSION OF SPINAL ANAESTHESIA FOR ELECTIVE CAESAREAN SECTION?
P. K. Sood, P. J. F. Cooper, M. Z. Michel, M. Y K. Wee
Department of Anaesthesia, Poole Hospital NHS Trust. Poole. UK

Introduction
Hypotension occurs in about 90% of parturients receiving spinal anaesthesia if measures are not taken to prevent it.1 Methods to prevent and treat the hypotension include left uterine displacement, fluid preload and the administration of vasopressors. Mechanical devices that compress the lower limbs to prevent pooling of blood have been used.2 The aim of this study was to determine whether the combination of lower limbs compression using TED stockings and fluid preload would attenuate postspinal hypotension in elective caesarean section (CS).

Methods
Fifty parturients ASA I and II undergoing elective CS under spinal anaesthesia were allocated randomly to 2 groups; control group (n=25) and TED stockings group (n=25). TED stockings were applied to the lower limbs approximately 1 h before spinal anaesthesia. A mean of 3 baseline systolic arterial pressures (SAP) and heart rates (HR) were recorded in the left lateral tilt position. A preload of 15 ml/kg of Hartmann's solution was administered over 15 min. Spinal anaesthesia was instituted at L3/4 spinal interspace using a 25 gauge Whitacre needle and heavy bupivacaine 0.5% at the following doses: 2.0 ml, 2.2 ml, 2.4 ml for parturients under 150 cm, 150-165 cm, and greater than 165 cm in height respectively. Heart rate and systolic, diastolic and mean arterial pressures were recorded at one-minute intervals for the first 10 minutes and thereafter every 2.5-minute intervals. Hypotension was defined as an absolute SAP of less than 90 mmHg or a fall of more than 20% from baseline, whichever was higher. All episodes of hypotension were treated with i.v. ephedrine 3 mg repeated as necessary.

Results
The 2 groups were comparable with respect to maternal age, weight, height, baseline SAP, HR, and level of sensory block. There was no statistically significant differences in the percentage fall of SAP between the 2 groups using unpaired two sample t-test (P> 0.05). Nevertheless, at all 14 times of measurement, a higher SAP was noted in the TED group compared with the control group (Fig. 1). 80% of the parturients in the control group required ephedrine compared with 56% in the study group. The difference in the amount of ephedrine used in both groups was not statistically significant using the $\chi^2$ test.

Discussion
The most common complication of spinal anaesthesia for CS is maternal hypotension secondary to sympathetic blockade. TED stockings have been shown to reduce the diameter of gastrocnemius veins by a median of 48%.3 In our study, TED stockings...
combined with a preload of 15 ml/kg of crystalloid solution did not significantly prevent hypotension following spinal anaesthesia for caesarean section. Therefore, it cannot be recommended as an effective measure against post-spinal hypotension for caesarean section.

References

LOW INCIDENCE OF POSTDURAL PUNCTURE HEADACHE IN INDIGENOUS ZIMBABWEAN OBSTETRIC PRACTICE – A PRELIMINARY STUDY
A. G. McKenzie
Harare Central Hospital, Southerton, Harare, Zimbabwe

Introduction
Introduction: In Zimbabwe spinal anaesthesia has been used for Caesarean section for many years, despite poor availability of fine spinal needles. Thicker needles have perforce been used and anecdotal reports have suggested that postdural puncture headache (PDPH) is not seen. The aim of this study was to investigate the incidence of PDPH following use of 18 gauge and 25 gauge Quincke needles.

Methods
Sixty indigenous Zimbabwean women agreeing to spinal anaesthesia for caesarean section were allocated randomly to receive either an 18 or a 25 gauge Quincke point spinal needle. The needles were inserted with bevel aligned parallel to the dural fibres. The patients were reviewed 24, 48 and 72 h (at least) after surgery. A headache was classified as PDPH if it was posture related, and graded as minimal, mild, moderate or severe. Planned management of PDPH was initially paracetamol and increased oral fluids, progressing to epidural blood patch if necessary.

Data were analysed using Fisher’s Exact test. A value of $P<0.05$ was taken as statistically significant.

Results
There were 30 patients in each group. The incidence of PDPH was 20% in the 18 gauge group (n severe) and 0% in the 25 gauge group ($P<0.05$). No patient required an epidural blood patch.

Discussion
While the relationship of needle bore to PDPH is not surprising, the incidence of PDPH in this study is far lower than higher published figures from Europe. The observation (in cadavers) that thick punctured dura retracts more rapidly than thin suggests that this population may have thick dura, which could be genetically or environmentally determined. It is hoped that this study will be continued on larger numbers of patients.

References

CARDIOPULMONARY RESUSCITATION: KNOWLEDGE AND TRAINING OF MIDWIFERY STAFF
M. Patel, L. Brennan, R. Fernando, B. Morgan
Queen Charlotte’s and Chelsea Hospitals, London, UK

Introduction
Cardiac arrest in late pregnancy may be estimated to occur once in 30,000 pregnancies and survival after such an event is exceptional. Although the knowledge and skills surrounding the practice of cardiopulmon-
ary resuscitation (CPR) have become essential to intensive care nurses and to nurses in general, training of midwifery staff remains very poor. The aim of this study was to assess the CPR knowledge and skills of midwives before and after training.

Methods
Forty-five qualified midwives were randomly selected for assessment. Time when training was last given and whether it was given during or after midwifery training was noted. Basic resuscitation skills were assessed before training and 2 months after training using the Recording Resusci Anne manikin. Training consisted of a short lecture on basic resuscitation including the special problems of pregnant women, as well as practical training using the Resusci Anne manikin.

Results
Duration since last CPR training = 4.9 ± 0.9 years. CPR training during/after midwifery course = 9/45 (20%).

The table shows the resuscitation skills of midwives before and after training.

<table>
<thead>
<tr>
<th></th>
<th>Before training % satisfactory</th>
<th>After 2 months % satisfactory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mouth: Mouth ventilation</td>
<td>8.8</td>
<td>68.9</td>
</tr>
<tr>
<td>Head Position</td>
<td>8.8</td>
<td>66.7</td>
</tr>
<tr>
<td>Chest compression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand position</td>
<td>31.1</td>
<td>62.2</td>
</tr>
<tr>
<td>Compression rate</td>
<td>66.7</td>
<td>91</td>
</tr>
<tr>
<td>Compression force</td>
<td>24.4</td>
<td>71.1</td>
</tr>
<tr>
<td>Carotid pulse palpation</td>
<td>15.5</td>
<td>80</td>
</tr>
<tr>
<td>Ventilation: Compression rate</td>
<td>8.8</td>
<td>33.3</td>
</tr>
</tbody>
</table>

Conclusions
CPR training of midwives is poor, both during and after midwifery training. Although this study was undertaken in a single obstetric unit, these findings are indicative of other units as other investigators have reported similar problems and recent assessment undertaken by us of CPR skills of midwives in other units has revealed similar results. Retention skills of CPR training of midwives like all other health care workers is poor and in order to maintain their resuscitative skills, midwives should be frequently trained and assessed.

References
Emergencies, in 96 (48.5%) they were covering the ITU as well. In the rest of the units in addition to covering obstetrics and ITU they were covering the first on call as well.

Anaesthetic assistance
In 129 (63.5%) of the units, skilled assistance was provided by ODAs. 23 (11.3%) of the units, had an anaesthetic nurses helping the on-call anaesthetist, whereas 21 (10.3%) of the units used both ODAs and anaesthetic nurses. When on call, in 140 (80.9%) of these units the person helping the anaesthetist was resident in the hospital. 19 (9.3%) of the units had midwives helping the anaesthetist in theatre, 11 (5.6%) had a combined team of midwives, anaesthetic nurses and ODAs.

Difficult intubation
199 (96.6%) of the units had a laryngeal mask on the difficult intubation tray, of these, 37 (18.5%) said they had found the laryngeal mask to be life-saving.

Failed intubation
In the year preceding the survey, 83 of the units had failed intubations. The maternal outcome was reported good in all these cases, with only 1 unit reporting a fresh still birth. Following a failed intubation, spinal anaesthesia was commonly performed, followed by use of laryngeal mask to provide anaesthesia for the section. For future reference, 145 of the units placed a warning in the patients notes.

Emergency drugs
In 170 (83.4%) of the units, thiopentone, suxamethonium and atropine were commonly drawn up in syringes, for emergency use. In the majority of units the drugs were changed every 24 h. 156 (78.4%) of the respondents thought this to be a safe practice, 17 (8.6%), while pre-drawing drugs up, had their reservations, while 26 (13%) did not think it to be a safe practice. 7 of the respondents were aware of mishaps occurring from use of pre-drawn drugs.

Induction of anaesthesia
For emergency caesarean section, in 195 (94.2%) of the units, anaesthesia was induced in the theatre. To avoid aorto-caval compression, 104 units (53.1%) used a wedge, 55 (28%) of the units employed lateral tilting of the table, while both techniques were used in 37 (18.9%) of the units.

Intensive care
144 (69.5%) of the units had an ITU on site, 55 units (26.5%), while not having an ITU on site, had access to a nearby ITU. Because of their geographical location or of the high workload of the neighbouring ITU, 8 (4%) of the units did not have easy access to ITU beds.

Haematological laboratory services
175 (84.5%) of the units had on-site laboratory services, whereas 32 (15.5%) of the units did not have such service on site and the time taken to get a response varied from 30 min to 120 min. O-negative blood, for emergency transfusion, was stored on site in 132 of the units.

SINGLE-SHOT SPINAL ANAESTHESIA FOR CAESAREAN SECTION: A COMPARISON OF RIGHT LATERAL AND SITTING POSITIONS
A. Inglis, M. Daniel, E. M. McGrady
Department of Anaesthesia, Bellshill Maternity Hospital, Lanarkshire, UK

Introduction
Previous work has investigated the effect of posture on the spread of isobaric bupivacaine (right versus left lateral positions), and the spread of hyperbaric bupivacaine when a combined spinal and epidural technique was used (sitting or left lateral position). Any delay in adopting the supine position in mothers who are sitting for spinal insertion, as may occur during epidural insertion, might delay the cephalad spread of sensory block when hyperbaric solutions are used. A randomised study was undertaken to investigate the spread of hyperbaric bupivacaine when a single-shot spinal injection was made with mothers either sitting (group A) or in the right lateral (group B) position.

Method
Forty mothers who presented for elective caesarean section, with term, singleton pregnancies and maternal heights of 150–170 cm were randomly allocated to groups A or B. After one litre of intravenous crystalloid, spinal anaesthesia was established at interspace L2/3 using a 24 gauge Sprotte needle and 2.5 ml 0.5% hyperbaric bupivacaine,
injected over 10 seconds. Mothers were immediately placed in the supine position with 20° left lateral tilt. Analgesic (pinprick felt blunt, not sharp), anaesthetic (no sensation of pinprick) and motor block were assessed at 2 min intervals. Ephedrine 3 mg i.v. was given for nausea or systolic BP <90% baseline.

Results

Demographic data in the 2 groups were comparable. Three of the ‘lateral’ spinals were difficult to site (two failures and one sited at L3/4.) The lateral spinals took significantly longer to site. Maximum height of block and onset of motor blockade were comparable.

Ephedrine requirements were higher in group B at 10 min (median 12 mg cf 6 mg P=0.047). Mothers who complained of discomfort received increments of i.v. alfentanil 0.25 mg; discomfort was not related to the height of sensory block.

Comment

Mothers in group B (lateral) had a faster onset of sensory block to T6, though a similar onset to T4, when compared with group A (sitting) but the spinals took longer to site and required more ephedrine in the first 10 min. Similar doses of hyperbaric bupivacaine are recommended for these positions, provided mothers adopt the supine position immediately after injection in the sitting position.

Table.

<table>
<thead>
<tr>
<th></th>
<th>Time to site (s)</th>
<th>Anaesthetic block at T6 (min)</th>
<th>Anaesthetic block at T4 (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A (n=20)</td>
<td>115 (60, 120)</td>
<td>10 (8, 12)</td>
<td>11.5 (10, 14)</td>
</tr>
<tr>
<td>Group B (n=17)</td>
<td>240 (130, 360)</td>
<td>8 (6, 10)</td>
<td>10 (7.8, 12)</td>
</tr>
</tbody>
</table>

Data are presented as median and inter-quartile ranges. Group A—sitting, group B—lateral.

References


INTRATHECAL MORPHINE OR DIAMORPHINE FOR CAESARIAN SECTION? PRELIMINARY FINDINGS

C. Roulson, A. Chan, M. Albin, F. Carli
Northwick Park Hospital, Harrow and Lewisham Hospital, London, UK

Introduction

Intrathecal opioids have been successfully used for pain relief in obstetric anaesthesia. Although the combination of subarachnoid morphine with local anaesthetic is well documented for caesarian section,1 there is little experience with diamorphine.

Method

One hundred ASA 1 patients were randomised double-blind to 5 groups. Group 1 (n=22) received 0.2 mg morphine, Group 2 (n=16) 0.1 mg diamorphine, group 3 (n=21) 0.2 mg diamorphine, group 4 (n=21) 0.3 mg diamorphine and group 5 (n=20) 0.9% saline.

Subarachnoid anaesthesia with upper sensory block T2–T5 was established with 2.0–2.5 ml of 0.5% hyperbaric bupivacaine with addition of 0.2 ml of trial solution. Time to next analgesia and side effects (itching, nausea and vomiting) were recorded.

Results

Time to next analgesia was shorter in the control group (mean 355 min) compared with the treatment groups (mean 897-1194 min), P<0.001. Differences between the morphine and diamorphine groups did not achieve significance. In the diamorphine groups time to next analgesia increased with dose received. Time to next analgesia was similar for morphine 0.2 mg and diamorphine 0.3 mg.

Nausea and vomiting showed a similar trend with significantly higher incidence of vomiting in the group receiving morphine (59%) compared with those receiving diamorphine, P<0.05 (0.1 mg diamorphine 6%, 0.2 mg 10%, 0.3 mg 19%). There was no vomiting in the control group. The incidence of itching was similar in all opioid treated groups (70–82%).

These preliminary findings indicate that 0.3 mg intrathecal diamorphine produces a similar duration of analgesia to 0.2 mg morphine with a significantly lower incidence of vomiting.

Reference

DOES POSTURE HAVE AN EFFECT ON NEONATAL OUTCOME DURING THE CONDUCTION OF SPINAL ANAESTHESIA?

M. Patel, R. Fernando, J. Cordingley, B. Morgan
Queen Charlotte’s and Chelsea Hospitals, London, UK

Introduction

Around 10% of pregnant women develop supine hypotension syndrome. In others, supine compression of the inferior vena cava is concealed since there is no change in maternal blood pressure and only a small decrease in cardiac output.1 To avoid the problems of supine hypotension, the lateral position has been advocated for maternal management during labour for fetal blood sampling and even for establishing regional anaesthesia. As a result it has become increasingly popular to perform regional anaesthesia for caesarean section (CS) in the lateral position and to maintain the lateral position until surgery is ready to begin. However, no prospective randomised studies have been undertaken to compare the effect of lateral position with left lateral tilt position on neonatal outcome. The aim of this study was to assess whether there was a difference in neonatal outcome if parturients were placed in left lateral or 20° left lateral tilt position after the induction of spinal anaesthesia.

Methods

After Ethics Committee approval and informed consent 30 parturients with singleton pregnancies undergoing elective CS under regional anaesthesia were recruited. All received spinal anaesthesia in the sitting position with 2.0 ml of isobaric bupivacaine using a single space combined spinal epidural technique. The patients were then randomly allocated into either the left lateral or 20° left lateral tilt position. Parturients in the left lateral position were maintained as such until immediately before surgery.

Precautions taken to avoid maternal hypotension (defined as a fall in systolic arterial pressure of more than 30 mmHg) were a preload of 1 litre of Hartmann solution followed by an infusion of ephedrine (60 mg of ephedrine in 1 litre Hartmann’s solution). Time taken from injection of local anaesthetic to achieve bilateral block to T4 was defined as the onset time. Motor block was assessed on a 4 point Bromage scale (0–3) and time taken to reach grade 3 noted.

The condition of the neonates was assessed by Apgar scores at 1 min and at 5 min and by acid base sampling of cord blood at birth. The time from uterine incision to delivery of the infant was noted as the uterine incision to delivery (UD) time.

Results

There was no difference in the demographic characteristics of the 2 groups. Times to T4 and grade 3 motor blockade were similar, as were the UD times. There was no significant difference between the incidence of hypotension and the amount of ephedrine used.

Apgar scores were greater than 7 at 1 min and 9 at 5 min in all babies.

Table.

<table>
<thead>
<tr>
<th></th>
<th>Lateral tilt</th>
<th>Lateral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Umbilical artery pH</td>
<td>7.26 ± 0.04</td>
<td>7.27 ± 0.05</td>
</tr>
<tr>
<td>Umbilical vein pH</td>
<td>7.30 ± 0.03</td>
<td>7.31 ± 0.06</td>
</tr>
</tbody>
</table>

Conclusions

There was no difference in neonatal outcome between the 2 groups as assessed by Apgar scores and acid base sampling of cord blood. It would appear from these results that during the conduct of spinal anaesthesia for elective caesarean section, a 20° left lateral tilt is sufficient to prevent significant aortocaval compression. This is also confirmed by the finding that there was no difference between the 2 groups in the incidence of hypotension and the amount of ephedrine used.

Reference


MATERNAL AGE IN PRIMIGRAVIDAE AS A FACTOR IN OBSTETRIC OUTCOME

M. Patel, J. Cordingley, B. Morgan
Queen Charlotte’s and Chelsea Hospitals, London, UK

Introduction

A feature of social change in Europe is the voluntary postponement of childbearing.1 The anaesthetic and obstetric implications of such delay has not being fully elucidated.

Methods

A retrospective study of 5515 consecutive primiparae with term singleton cephalic infants was undertaken. We report epidural analgesia rate and mode of delivery as related to maternal age.
Results

The table gives details of the whole age group and that of women at the outer age limits.

Table

<table>
<thead>
<tr>
<th>Total population</th>
<th>Age</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;20</td>
<td>&gt;40</td>
</tr>
<tr>
<td>Total number n (%)</td>
<td>5515</td>
<td>284 (5)</td>
</tr>
<tr>
<td>Elective caesarean section</td>
<td>264</td>
<td>2</td>
</tr>
<tr>
<td>Number in labour</td>
<td>5251</td>
<td>282</td>
</tr>
<tr>
<td>Emergency caesarean section n (%)</td>
<td>627 (12)</td>
<td>22 (8)</td>
</tr>
<tr>
<td>Instrumental deliveries n (%)</td>
<td>1867 (36)</td>
<td>54 (19)</td>
</tr>
<tr>
<td>Epidural analgesia n (%)</td>
<td>3104 (59)</td>
<td>134 (48)</td>
</tr>
<tr>
<td>No intervention n (%)</td>
<td>1707 (33)</td>
<td>132 (47)</td>
</tr>
</tbody>
</table>

*P<0.05 between groups.

Discussion

National figures in the UK between 1985 and 1987 show that only 15% of primiparae were over the age of 30. This obstetric unit with 45% primiparae over the age of 30 indicates the future obstetric and anaesthetic workload associated with rising maternal age. This will have financial implications for obstetric units as the level of staffing and the quantity and quality of equipment for monitoring mother and fetus will need to be reassessed, as the complication rate increases with age. Furthermore, it is apparent that if reliable comparisons of obstetric outcome between countries and units are to be made, demographic details of the population concerned must detail the number of primiparae over 30 years of age rather than the mean age. Only 16% of women over the age of 40 delivered without any obstetric or anaesthetic intervention, and we as physicians need to be aware of these findings in order to counsel them adequately.

References