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A CLINICAL STUDY OF LABOUR USING EPIDURAL ANALGESIA WITH 0.125% BUPIVACAINE AND ITS OUTCOME

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ABSTRACT

Background: Minimum effective concentration of local anesthetics for providing optimal labour epidural analgesia and the strategies aiming to reduce their consumption are continuously being searched.

Objectives: The objective of this study was to evaluate the efficacy of 0.125% bupivacaine for epidural labour analgesia.

Materials and Methods: This was a prospective study carried out in department of obstetrics and gynaecology in Rajah muthiah Medical College and Hospital from 2015-2017 after ethical clearance and written knowledgeable concent. A total of 100 parturients in both latent and active phase of labour were to receive an epidural injection of 12 ml of bupivacaine 0.125% as initial bolus dose. Same dose regimen was used as subsequent top-up dose on patients demand for pain relief. The duration and quality of analgesia, motor block, top-up doses required consumption of bupivacaine and feto-maternal outcome were observed.

Results: Effective labour analgesia with minimal motor blockade was observed with no failure rate. Onset of analgesia was significantly faster. Duration of analgesia after initial bolus dose was also significantly reduced. Mean VAS scores were significantly less after bupivaccine. There were no significant changes in hemodynamics, nor adverse effects related to neonatal or maternal outcomes.

Conclusion: We conclude that the concentrations of bupivacaine (0.125%) are effective in producing epidural labour analgesia and was found superior in terms of faster onset, prolonged duration, lesser breakthrough pain.

INTRODUCTION

Maternal and fetal effects of analgesia during labour remain central to discussions among patients, anesthesiologists, and an obstetrical caregivers[3,4] with the controversies[5,6]. In obstetrical anesthesia including the effects of regional anesthesia on the progress and outcome of labour as well as effects on the neonate.[3,4] Evidence is suggestive that labour disorders including maternal hypertension, dystocia, meconium staining, and fetal distress are stress related.[1,2]. Hence, maternal pain relief not only benefits the parturient, but her neonate also. Of all the available methods of labour analgesia, epidural analgesia satisfies the basic requirements of labour analgesia by fulfilling the objective of decreasing the pains of labour without affecting other sensations such as a desire to push and to allow normal walking while preserving the tone of pelvic floor muscles as well as retaining the sensation of the baby's head in the vagina; thus, allowing labour to proceed unhindered.

MATERIALS AND METHODS

Patient selection

Parturients in latent and active phase of labour, having contractions at least once every 5 min, not having any

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contraindication to epidural analgesia, and who requested epidural analgesia for pain relief were enrolled in this study. Exclusion criteria included hypersensitivity to study drugs, bleeding disorders, decreased platelet counts, sepsis, and a history of drug abuse; spinal column deformities and spine surgery.

Labour analgesia technique

After informed consent patients were subjected to a thorough pre-anesthetic evaluation. Before placement of the epidural catheter, VAS score was noted with VAS 0 = no pain and 10 = the worst imaginable pain along with baseline vitals. After starting a 500 ml infusion of Ringers' lactate in an 18G peripheral intravenous cannula, parturients in both groups were placed in the left lateral position. Following strict aseptic techniques, and infiltrating 2% lignocaine HCl into the intervertebral space, epidural space was identified at L3-4 or L4-5 space using a loss of resistance technique to normal saline with an 18G Tuohy needle and an 18-gauge multi-orifice catheter was threaded through the cephalad directed tip of the epidural needle to a depth of 5 cm into the epidural space. If there was no blood or cerebro spinal fluid (CSF) on aspiration from the epidural catheter, depending on the group allocated, a 3-ml test dose of the study medication was administered through the catheter. The presence of clinical signs of an intravascular injection were sought, for the following 2-3 min, by asking the patient whether she felt dizzy, had tinnitus, or a metallic taste in her mouth. If there were no signs of an intravascular injection, the catheter was secured and the woman was placed in the supine position with left uterine displacement. Five minutes after the test dose, if there were no clinical signs of subarachnoid injection (as evidenced by the patient's ability to move her legs and the absence of hypotension), an additional 12 ml of the study solution was administered. This dose was defined as first initial bolus dose and time was noted. On intravascular placement of the catheter, it was removed and resisted at another interspace while all patients with intradural placement of catheter were removed from the study. The adequacy of analgesia was assessed 5 min after the first initial bolus dose of study drug had been administered. Analgesia was considered adequate if pain score was <3 If analgesia was not adequate 15 min after the first initial dose, an additional 15 ml of study medication (second initial dose) was administered, and analgesia reassessed in the same manner. If pain relief was inadequate at the peak of a contraction, 15 min after the second initial dose of bupivacaine; the epidural anesthetic was classified as bupivacaine failure, and patient withdrawn from the study. Presence of motor block in the lower extremities was assessed using a modified Bromage scale. VAS and modified Bromage scale was assessed every 15 min. All parturients were given a trial walk to assess their ability to ambulate. An additional dose of bupivacaine 15 ml was given as a top-up dose on patient request, with a minimum gap of 15 min between two subsequent top-up doses. Epidural analgesia was continued through the second stage of labour.

Data recording

Demographic data (age, weight, height), obstetric data (parity, dilatation of the cervix [0-10 cm], station of the vertex of the presenting part [−3 to +3], effacement of the cervix (%), membrane status) were noted prior to the initiation of labour analgesia. Pain score (VAS), sensory and motor block characteristics and vital parameters (pulse, mean arterial pressure, respiratory rate) were recorded at 0 (before epidural), 5, 15 min and then every 15 min till 1 h and then every 30 min until the delivery. Onset of analgesia was defined as duration from injection of first initial epidural bolus dose to attainment of VAS <3 and duration of analgesia of initial bolus dose was defined as time of administration of study drug until the time of demand of top-up for the first time A verbal pain score (VPS) was obtained by using a numeric rating scale (0 no pain, 10 worst pain imaginable). Pain was assessed before epidural placement and at 15, 30, and 60 min after study drug administration, then every 2 h until delivery or decision for cesarean delivery. Sensory levels to pinprick and degree of motor blockade were determined at the same time intervals. Motor block was measured with a 0-3 scale (grade 0 can raise extended leg off bed, grade 1 can bend knees, grade 2 can bend ankles, grade 3 unable to bend knees or ankles). For incomplete perineal analgesia at delivery, patients received 5 mL of 1% or 2% of lignocaine. Patient satisfaction was assessed after delivery as excellent, good, fair, or poor. Monitoring included noninvasive maternal blood pressure, tocodynamometry, and continuous fetal heart rate throughout labour. Hypotension was defined as systolic blood pressure 100 mm Hg and was treated with left uterine displacement, IV fluid, or ephedrine. Fetal bradycardia (120 bpm) was treated with left uterine displacement, maternal oxygen (10 L/min face mask), IV fluid, or ephedrine, as indicated.

The time taken by the parturient to request for subsequent top-up dose was recorded. Labour was managed according to our obstetric department's protocols and mode of delivery (normal/ instrumental delivery/caesarean delivery) was noted. Injection delivery interval was defined as the time from administration of first initial epidural dose until the delivery. Fetal heart rate was monitored throughout the study by using a cardiotocograph, and any evidence of fetal heart rate decelerations was recorded. Neonatal assessment was performed by assessing the Apgar score at 1 and 5 min.

Quality of maternal expulsive efforts was assessed by an obstetrician as Grade 0 - Failure, 1 -Incomplete, 2 - Good, 3 - Excellent. Quality of analgesia was assessed by an esthesiologist as Grade 0 - Failure, 1 - Incomplete, 2 - Good, 3 - Excellent, 4 - Not possible to evaluate (NPE) if delivered by cesarean section. Side-effects including nausea, vomiting, hypotension, hypersensitive reaction, shivering, fever, drowsiness, pruritus, respiratory depression, retention of urine, and weakness in limbs were noted.

None of the patients had episodes of hypotension and bradycardia requiring treatment as was also noted earlier that changes in maternal pulse rate (PR) and blood pressure are not related to change in the dose of local anesthetic.

RESULTS

Mode of delivery in epidural labour analgesia presented in table 1. Out of 100 mothers, 69 were delivered normally, 24 mothers underwent caesarean section, 6 were delivered with help of outlet forceps, one by vaccum.

Table 1 Mode of Delivery

Out come	No. of cases	Percentage
Normal	69	69.0
Operative forceps	6	6.0
Operative vacuum	1	1.0
LSCS	24	24.0
Total	100	100.0

Table 2 Indications for LSCS

Indications for LSCS	No. of cases	Percentage
Fetal bradycadia	7	29.17
Fetal distress	4	16.67
MSL	3	12.50
CPD	8	33.33
Non progress	1	4.17
Cervical dystocia	1	4.17
Total	24	100.00

Indications for LSCS presented in table 2. Out of 24 LSCS, 7 LSCS done for Fetal bradycardia, 8 for cephalo pelvic disproportion,4 for fetal distress, 3 for meconium stained liquor, one for non progress of labour, one for cervical dystocia.

Table 3 Apgar in one Minute

APGAR 1 min	No. of cases	Percentage
0-3	14	14.0
4-5	38	38.0
6-7	44	44.0
8-9	4	4.0
Total	100	100.0

One minute APGAR presented in table 3.In our study, out of 100 babies, in one minute APGAR, majority of the babies were between 6-7 constituting 44%, 38 babies were between 4-5, 14 babies were between 0-3, 4 babies were between 8-9.

Table 4 Neonatal Outcome

NICU	No. of cases	Percentage
Admission	32	32.0
Observation	23	23.0
BWM	45	45.0
Total	100	100.0

Neonatal outcome presented in table 15.In our study, out of 100 babies, 45 babies were given to mother side, 32 babies were admitted in NICU,23 babies were observed in NICU

Table 5 Complications in Epidural Labour Analgesia

	No. of cases	Percentage
Shivering	34	34.0
Accidental dural puncture	3	3
Post dural puncture head ache	3	3
Maternal exhaustion	1	1

Complications In Epidural Labour Analgesia presented in table 6.

In our study, out of 100 patients, 34 had shivering, 3 patients had post dural puncture headache due to accidental dural puncture

Table 6 Complications for Babies

Baby complications	No. of cases
Birth asphyxia	14
Perinatal depression	17
MSL	3
Mortality	1

Complications for Babies presented in table 7. In 32 NICU admitted babies,14 babies was found to be birth asphyxia,17 was perinatal depression, 3 babies had meconium aspiration syndrome, one baby was died due to severe birth asphyxia

DISCUSSION

Effective pain relief

Neuraxial analgesia fulfils many of these characteristics. Epidural analgesia provides significantly more analgesia, as measured by visual analog scale in both the first and second stage of labour[8], (Leighton BL,2002) While parenteral opioids may provide sedation, relaxation and comfort, there is strong evidence to suggest that morphine and meperidine do not decrease pain intensity,[7](Olofsson C 1996)

Safety

While side effects can occur, the incidence of permanent maternal injury is low. Neuraxial analgesia results in less neonatal depression than parenteral opioids [8]. (Leighton BL,2002)

Choice of local anesthetics

In North America, bupivacaine and ropivacaine are commonly used for labour analgesia. Bupivacaine was superior to the older local anesthetics, because of its increased duration of action, reduced incidence of tachyphylaxis, and reduced intensity of lower limb motor block. Ropivacaine was synthesized in order to reduce the cardiotoxicity associated with bupivacaine and to reduce motor block further.[9], (Albert *et al*,1975)

The use of bupivacaine and ropivacaine in labour has recently been reviewed.[10], (Beilin Y *et al* 2010) Considering the low doses used for labour, toxicity is rarely associated with either drug. Both are effective analgesics, with little or no difference in maternal satisfaction or effect on labour. There is some evidence to suggest that ropivacaine may produce less motor block in prolonged labours[11],(Halpern *et al* 2003)

Characteristics of ideal labour analgesia

- Effective pain relief
- Safe
- Minimal effects on progress or outcome of labour
- Minimal effects on the fetus or newborn
- Minimal maternal side effects

Choice of concentration of local anesthetic

Traditional epidural analgesia was initiated with 0.25%-0.5% bupivacaine and maintained with intermittent bolus doses of similar anesthetic solutions. Dense motor block of the lower extremities resulted in dissatisfaction with the technique. Collis *et al* [12]. Conducted a randomized controlled trial that compared bupivacaine 0.25% to 0.1% with fentanyl for maintenance of labour analgesia. Using post-partum questionnaires, they found that women who received 0.1% bupivacaine felt that they had better self-control (P =0.001), less lower limb weakness, and more mobility than the control group. It is also possible that drug concentration may affect mode of delivery. While the cesarean section rate is not affected, COMET (Comparative Obstetric Mobile Epidural Trial) investigators in the UK found an increase in operative vaginal delivery rate in women assigned to maintenance of analgesia using 0.1% bupivacaine compared with those maintained with 0.25%.[13]. In both of these trials, there was no difference in the quality of analgesia. These large randomized trials provide sufficient evidence to suggest that low concentrations of local anesthetics provide excellent analgesia and superior maternal satisfaction compared with higher concentrations.

Maintenance of analgesia

The use of continuous epidural catheters allows maintenance of labour analgesia for prolonged periods of time. Intermittent boluses (by physician or midwife) can provide satisfactory analgesia, but require constant availability of a clinician capable of providing analgesia. Continuous infusions of low concentrations of local anesthetic result in less variability in the quality of analgesia, and require clinician boluses only for breakthrough pain. More recently patient-controlled epidural analgesia has become the preferred technique for maintenance of labour analgesia. This technique has proven to be safe and effective when used with dilute solutions of local anesthetics, with or without a lipid-soluble opioid, such as fentanyl or sufentanil. Clinicians set the bolus dose and lockout interval, and may choose a continuous infusion rate. Compared with continuous infusion alone, patients who receive patient-controlled epidural analgesia require fewer clinician interventions, a reduced dose of local anesthetic, and have less motor block of the lower extremities. Patient- controlled epidural analgesia superimposed on a continuous infusion further reduces the need for clinician interventions without increasing the incidence of motor block.(Halpern SH 2009)

There are a wide range of patient-controlled epidural analgesia settings that result in excellent analgesia with minimal motor block. The bolus dose can be set between 4 and 12 mL, with the most common settings between 5 and 8 mL. The lockout interval can be varied, bearing in mind it takes about 10 minutes for the patient to experience pain relief. There is also a wide range of appropriate settings for the background infusion. Low background rates result in more control by the parturient. A recent review discusses these issues in detail. (Halpern SH 2009)[14].

Hypotension

Hypotension is often defined as a 20%-30% drop in systolic blood pressure (compared with baseline) or a systolic blood pressure less than 100 mmHg. Because uterine blood flow and fetal oxygenation is directly related to maternal arterial pressure, hypotension is an important side effect that must be treated rapidly. The incidence of hypotension after the initiation of neuraxial analgesia during labour is estimated to be about 10%. The incidence of hypotension is lower in labouring women than in nonlabouring women. Hypotensive episodes are easily treated with complete uterine displacement, additional intravenous fluids, and in some occasions, addition of vasopressors. The treatment should be more aggressive if there is a concerning fetal heart rate pattern or if the mother is symptomatic.

Inadequate analgesia

Pan *et al*2004[15], investigated the failure rate with 12,590 neuraxial procedures for labour analgesia in a teaching institution. Failure was defined as epidural or combined spinal-epidural procedures resulting in inadequate analgesia or no sensory block after adequate dosing at any time after initial placement, inadvertent dural puncture by the epidural needle or catheter, intravenous epidural catheter, or any technique requiring replacement or alternative management. The overall failure rate was 12%, being significantly lower after combined spinal-epidural than after epidural analgesia (10% versus 14%; P = 0.001).

Accidental dural puncture and post dural puncture headache

Accidental dural puncture is an uncommon complication of epidural block. When it occurs, it can produce severe morbidity, although usually of limited duration. The postdural headache that results from accidental dural puncture can severely limit a new mother's ability to care for her newborn. Therefore, these headaches are often treated soon after diagnosis. Epidural blood patch (a sample of the patient's own blood, aseptically drawn and injected into the epidural space) is the most effective treatment of this complication. (Chestnut *et al* 2009),[16].

Choi *et al* 2003,[17] performed a meta-analysis that involved more than 30,000 obstetric patients. They determined that the risk of accidental dural puncture during epidural insertion was 1.5%. Of those patients who had accidental dural puncture, approximately 52% will result in postdural puncture headache.

Van de Velde *et al* 2008,[18] reported a retrospective review of more than 17,000 obstetric neuraxial blocks. The overall incidences of accidental dural puncture and postdural puncture headache in this population were 0.32% and 0.38%, respectively. However if more than one attempt was required to identify the epidural space, the

accidental dural puncture rate increased to 0.91%. Fifty-six percent of patients with witnessed accidental dural puncture developed post dural puncture headache.

Newer Insights into the Myths And Controversies

Increased rate of operative and instrumental delivery: Is epidural the cause?

The Cochrane Database Systemic trials have emphasized that epidural analgesia had no statistically significant impact on the risk of caesarean section. In two different metaanalyses of randomized trials, comparing patients with and without epidural, caesarean delivery was clearly not associated with epidural analgesia, which showed that there is no direct relationship of epidural and increased caesarean section.[Leighton BL,2002][33]

Use of neuraxial analgesia, however, is known to prolong the duration of labour on an average by 1 hr. The association of occipito posterior position, augmentation with oxytocin and instrumental delivery is relatively higher in patients receiving epidural analgesia. However, the use of low-dose mixtures has reduced the overall incidence of these undesirable adverse effects. In a large randomized trial involving 1,054 patients (COMET study), the introduction of a low dose of epidural infusion was associated with a 25% decrease in the instrumental vaginal delivery.[35]

Timing of epidural during labour: Epidural taken early vs. Late Most observational studies show a higher rate of caesarean delivery when epidural is initiated early in labour. The ACOG (ACOG Statement in 2000 -Evaluation of Caesarean Delivery) had suggested that epidural analgesia may be delayed until a cervical dilation of 4-5 cm is reached based on a study published by Thorp[34] *et al*., and few other studies.

However, the small degree of difference in cervical dilation between early and late groups (approximately1 cm) is an important limitation of these trials. Wong *et al*.,[36] in their landmark RCT of nearly 750 primigravid women in early labour, concluded that there was no difference in the operative delivery of caesarean rates when neuraxial analgesia was administered early in labour (2 cm) vs. a group where epidural analgesia was administered late in labour (4-5 cm). Another study that used conventional epidural also had similar conclusions.

After the above evidence and several other metaanalyzed studies, the ACOG committee revised their statement, no longer endorsing a delay and 406 Indian Journal of Anaesthesia | Vol. 54| Issue 5 | Sep-Oct 2010 explicitly disavowing the consideration of fear of increasing the risk of caesarean delivery. The ACOG and the American Society of Anesthesiologists (ASA) have also jointly emphasized that there is no need to wait arbitrarily till the cervical dilation has reached 4-5 cm, and endorsed a statement that "Maternal request is a sufficient indication for pain relief in labour."[ACOG, 2006] [37]
Early vs. delayed pushing

Delayed pushing has been advocated in parturients under neuraxial blockade. Passive descent should be encouraged along with delayed and monitored pushing during birth to safely and effectively increase spontaneous vaginal births, decrease instrument assisted deliveries and shorten the pushing time.[Brancato[38] RM *et al*,2008] The Pushing Early or Pushing Late with Epidural (PEOPLE) Study also supported delayed pushing for a better outcome.[39]

Withholding the epidural top-up in the second stage;
Many centres discontinue epidural analgesia late in labour to improve a woman's ability to push and reduce the rate of instrumental delivery. But, in the RCTs of epidurals discontinued late in labour compared with continuation of the same epidural protocol until birth (462 participants), the reduction in the instrumental delivery rate was not statistically significant. [Robert [40] CL *et al* 2000] However, there was a statistically significant increase in inadequate pain relief when the epidural was stopped (22% vs. 6%, RR 3.68, 95% CI 1.99-6.80).

Neonates and outcome

While all medications cross the placenta and may be measured in the newborn, local anesthetics do not cause neonatal depression. *The neonates of women with epidural analgesia in our study when compared to those without had significantly lower APGAR scores at 1 minute but similar APGAR scores at 5 minutes. This is in line with the Cochrane[41] review in 2011, which reported that there were no significant differences in neonatal APGAR scores at 5 minutes in babies born to women with epidural analgesia.*

Backache and epidural In two recent randomized trials, there were no significant differences in the incidence of long-term back pain between women who received epidural pain relief and women who received other forms of pain relief. [Lim y *et al* 2006].

Nerve damage

Presently, it is stated that infective complications are no more than what is being reported with other neuraxial techniques. Insertion of epidural catheter more than 5 cm inside the epidural space can cause knotting and looping of catheters in the epidural space. Fluoroscopy or radiograph may not be helpful in locating the catheter. Computed tomography (CT) helps in locating the knotted or torn epidural catheter. The literature reports a case of catheter knot in the epidural space as well as a loop within the interlaminar ligamentum flavum between L3 and L4, visualized by CT. [Quinio b,2002]

Epidural catheters may injure nerve roots either because they are inappropriately rigid or because they are threaded too deeply and may compress a root,[19] although a flexible catheter is unlikely to do lasting damage to a nerve root in the epidural space.

In 2009, the Royal College of Anaesthetists in the UK published the third National Audit Project of Major Complications of Central Neuraxial Block.[20] In total, 320,425 obstetric procedures were analyzed. The incidence of permanent harm after spinal anesthesia was 1.5 in 100,000, 0.6 in 100,000 after epidural, and 3.9 in 100,000 after a combined spinal-epidural procedure. Overall, in this series, the incidence of permanent harm following neuraxial block was 1.2 in 100,000. Of note, the incidence of nerve damage from obstetric causes unrelated to neuraxial analgesia is almost 1%.(Wong *et al* 2003),[21].

Infection

Epidural abscess and meningitis are infrequent complications of neuraxial techniques. Reynolds *et al* 2009,[22] reported acombination of the findings of 10 surveys. The incidence of epidural abscess after obstetric epidural procedures was 3/100,000. The incidence of meningitis after spinal and combined spinal-epidural anesthesia was 1/39,000.

Abscess formation complicates 0.2-3.7 per 100,000 obstetric epidurals. Bacterial meningitis after neuraxial block had a projected incidence of 0-3.5 in 100,000 (95% CI). It is more frequent after spinal and combined spinal-epidural techniques than after an epidural. (Cook *et al* 2009),[20].

Epidural hematoma

In spite of the engorgement of epidural veins during pregnancy, epidural hematoma causing neurologic deficits is very rare in the obstetric population, and perhaps the hypercoagulable state of pregnancy acts as a protective factor. In a report of six surveys that together involved more than 1,220,000 obstetric epidural procedures, one case of epidural hematoma was found. (Reynolds *et al* 2009),[19].

Ruppen[23] *et al* 2006 summarized the results of 27 studies involving 1,370,000 women who had received neuraxial blocks. The risk of epidural hematoma was 1/168,000 overall.

Technique and patient position

Correct patient positioning is probably the most important factor leading to a successful block. First, it is important to align the vertebrae so that the needle can be inserted between the spinous processes into the epidural space. Twisting of the back will result in the needle contacting the lamina. Second, a position that maximizes the distance between the spinous processes is preferable. Because most parturients at term have a lordotic lumbar spine, maneuvers that flatten or reverse the curvature are advantageous. For example, the "hamstring stretch position" (sitting position with maximum knee extension, hip adduction, and forward lean) has been described to accomplish this. Finally, it is important to be able to identify the midline. In most patients, this can be done by palpating the spinous processes. However, in some patients, the spinous processes are not palpable because of excess adipose tissue or well developed paraspinous muscles. In the sitting position, the midline can be found by drawing a straight line between the vertebra of C7 (palpable in most patients) and the coccygeal cleft. Ultrasound identification of the midline may be useful to locate the midline, determine the approximate depth to the epidural space, and to determine the level of puncture. Balki, 2009, Arzola,2007.,[24,25].

Epidural block can be performed in the lateral or sitting position, and the decision is usually based on anesthesiologist and patient preferences. When the spinous processes are not easily palpable, the sitting position is preferred. In patients with easily identifiable landmarks, Vincent and Chestnut [26],1991 found that neither the lateral nor the sitting position was clearly superior with regard to patient comfort, but heavier patients preferred the sitting position. In some patients, the sitting position may be associated with orthostatic hypotension and syncope. For this reason, it is important for an assistant to provide continuous support to the patient during the procedure. Maternal cardiac output can be reduced in the left lateral position, if held too tightly in position.(Andrews *et al*).[27].

Identification of epidural space

Early methods to find the epidural space relied on identification of negative pressure in the epidural space (eg hanging drop, Macintosh balloon). The two most common methods used rely on loss of resistance to injection of saline or air as the needle advances through the ligamentum flavum and enters the epidural space. Each technique has its own benefits and drawbacks. Compared with air, loss of resistance to saline has the advantage of providing a more obvious tactile endpoint when the needle enters the epidural space. However, because saline is a clear fluid, it may be confused with cerebrospinal fluid and dural puncture may be masked. A large volume of air or saline should not be injected when confirming needle placement. Large volumes of air may result in inadequate analgesia or patchy block. (Shenouda *et al* 2003)[28].

Large volumes of saline may result in inadequate analgesia because of dilution. (Okutomi 1998)[29], Schier[30] *et al* 2009 identified four studies that enrolled obstetric patients who had epidural analgesia and performed a metaanalysis on the results. In these randomized, controlled trials, epidural needle placement was confirmed with loss of resistance to either air or liquid. The outcomes included the incidence of difficulty passing the epidural catheter, intravascular cannulation, paresthesia, dural puncture, post dural puncture headache, and partial block. The authors concluded that the use of air or fluid to identify the epidural space did not change the incidence of any of these outcomes. Recently, a large randomized controlled trial confirmed these results.Grondin[31] 2009 This suggests that either method is suitable for epidural placement in labour.

Aseptic technique

In order to avoid the risk associated with infectious complications of neuraxial analgesia, meticulous aseptic technique should be observed. Because complications such as meningitis and epidural abscess are rare, there are few clinical trials that demonstrate whether or not a particular intervention is useful in preventing infection.

Recently the American Society of Anesthesiologists published clinical practice guidelines to prevent infectious complications from neuraxial blocks[32].

Table Recommended aseptic technique for neuraxial analgesia*

1. Removal of jewelry from hands
2. Hand washing
3. Wearing of caps and sterile gloves
4. Wearing masks that cover both mouth and nose; masks should be changed between cases
5. Individually packaged skin preparation

6. Chlorhexidine with alcohol for skin preparation; this must be allowed to dry before needle insertion; povidone-iodine with alcohol is also acceptable
7. Sterile draping
8. Sterile occlusive dressing

Note: *American Society of Anesthesiologists Task Force on infectious complications associated with neuraxial techniques

CONCLUSION

The second stage of labour was not prolonged indicating that bupivacaine in concentration of 0.125% does not interfere with the bearing down efforts of mother. Epidural analgesia provides significantly more analgesia, as measured by visual analog scale in both the first and second stage of labour, While side effects can occur, the incidence of permanent maternal injury is low, observed faster rate of cervical dilation, the risk of Caesarean delivery was not related to epidural analgesia, but walking epidural was difficult with 0.125% bupivacaine due to numbness in lower limbs.

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