ORIGINAL PROF-1024

EPIDURAL VS NON-EPIDURAL ANALGESIA IN LABOUR;

A RANDOMISED CONTROLLED TRIAL OF EPIDURAL VS NON-EPIDURAL FORMS OF PAIN RELIEF DURING LABOUR

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ABSTRACT... farooq_ahrana@yahoo.com Objectives: To determine the effects of epidural analgesia compared with non-epidural forms of pain relief in labour. Design Randomised controlled trials comparing epidural analgesia with alternative forms of pain relief in labour. Setting Combined Military Hospital Rawalpindi. Period. March 2002 to Feb 2003. Results: Epidural analgesia was more effective than non-epidural methods in providing pain relief. Adverse effects suggested by the rather small trials reviewed include motor blockade, longer first and second stages of labour, increased oxytocin use, malrotation, instrumental delivery and Caesarean section (particularly for dystocia). Conclusions: Epidural analgesia is an effective method of pain relief during labour. Further research is needed to define the adverse effects more accurately, particularly potential long-term adverse effects, and to evaluate different regional analgesia techniques.

Keywords: Epidural analgesia, dystocia, different regional analgesia, stress of labour, patient controlled analgesia (PCA), apgar score.

INTRODUCTION

Epidural analgesia is associated with pain relief during labour, and this is likely to be more effective than alternative treatments. However, it is likely that epidural blocks lengthen labour and result in increased rates of operative vaginal delivery. Studies show that epidural block maintained beyond the end of the first stage is associated with an assisted vaginal delivery compared with control treatments. Long term effects of epidural blocks in women and babies is needed to be established. The golden principles of simplicity .safety and preservation of fetal homeostasis are the essentials of obstetric pain relief. The effect of analgesia on the stress of labour, the pain of labour and delivery involves local segmental, supra segmental and cortical stress responses. Although epidural analgesia is widely used during labour and abolishes these stress responses, questions have been raised about short- and long-term adverse effects. Claims have been made that there may be an association between epidural block and increased chronic backache, maternal pyrexia, instrumental delivery, caesarean section for

dystocia and adverse effects on the newborn. The incidence of hypoxaemia during first or second stage labour is 3 times greater with no analgesia, or 1.4 times greater with intramuscular pethidine, than when epidural analgesia is provided by bupivacaine 0.125% without fentanyl. Total work of labour, maternal metabolism and oxygen consumption are reduced. Maternal and fetal acidosis is reduced.

MATERIAL AND METHODS

They were randomized controlled trials of epidural versus non-epidural forms of pain relief during labour. Five studies were conducted. Each Study included 50 patients. They were divided into two groups.

Group A	25 patients with epidural analgesia
Group B	25 patients with non epidural methods of pain relief.

Universally accepted criteria to put the patient on epidural block was followed. Criteria

No fetal distress

Good regular contractions 3-4 minutes apart and lasting about 1 minute.
Adequate cervical dilatation i.e. 5-6 cm for primiparous patients and 4-5 cm for multiparous patients.

Engagement of fetal head

Women who were given any form of analgesia were monitored closely. After epidural anaesthesia they were monitored with frequent measurements of blood pressure, level of consciousness and maternal oxygen saturation by pulse oximetry. Most trials used' bupivacaine in varying concentrations. Controls were mainly intramuscular or intravenous injections of pethidine, with para cervical block (one trial), intravenous pethidine by patient controlled analgesia (PCA) in three, and intravenous nalbuphine in one trial.

Inclusion criteria

Primiparous or multiparous pregnancy; spontaneous or induced labour; women without obstetric complications such as pre-eclampsia or complex presentations including breech or twins; any type of epidural administration compared with any form of analgesia not involving regional blockade or compared with no analgesia.

Exclusion criteria

Infection over the injection site, coagulopathy, marked hypovolemia, true allergies to local anaesthetics and the patients refusal or inability to cooperate for regional anaesthesia. Preexisting neurological disease, back disorders and some forms of heart disease were considered as relative contraindications. To standise it with international studies following parameters were tested. Vomiting, maternal hypotension, progress of labour, use of oxytocin, surgical amniotomy, motor blockade, fetal heart rate abnormality/ me conium passage, fever, mal-position, instrumental vaginal delivery, caesarean section, fetal and neonatal Apgar scoring.

RESULTS

Epidural analgesia was associated with greater pain relief than non-epidural methods, but also with longer first and second stages of labour, an increased incidence of fetal mal-position, and increased use of oxytocin and instrumental vaginal deliveries. With new trial data included, no statistically significant effect on caesarean section rates could be identified.

Four of five trials reported benefit of epidural bupivacaine compared with control treatments: One trial of 25 women showed bupivacaine preload plus top-up was superior to pethidine, nitrous oxide/oxygen inhalation or prudental block given in second stage. However, epidural block did not always provide satisfactory pain relief. A second trial of 21 women showed that bupivacaine epidural (preload plus continuous infusion) (some also

received 50 to 100 mg fentanyl) was better than 1 to 2 mg butorphanol (given every one to two hours). A third trial of 25 women showed similar epidural procedures were better than meperidine given as patient controlled intravenous analgesia. The fourth trial of 20 women showed a similar epidural procedure (given in stage one only) was better than fentanyl given as PCA during the first stage.

Criteria for epidural block for painless labour
No Fetal distress
Good regular contractions 3-4 minutes apart and lasting about a minute
Adequate cervical dilatation 5-6 cm for primiparous and 4-5 cm for multiparous women
Engagement of fetal head

Epidural vs controls	
Epidural	Controls
Bupivacaine in varying concentration (bupivacaine 0.125% + fentanyl 1ug/ml or bupivacaine 0.0625%+ fentanyl 2ug/ml)	Pethidine (IM/IV) with or without para cervical block Intravenous pethidine by PCA Intravenous nalbuphine

Signs of fetal distress
Non reassuring fetal heart rate pattern Repetitive late decelerations Loss of fetal beat to beat variability associated with late or dee decelerations Sustained fetal heart rate < 80 beats/ min Fetal scalp pH < 7.20 Me conium-stained amniotic fluid Oligohydramnios Intrauterine growth restriction

Apgar score

Heart rate (beats/min)	**0 Absent**	**1 <100**	**2>100**
Respiratory effort	**Absent**	**Slow, irregular**	**Good, crying**
Muscle tone	**Flaccid**	**Some flexion**	**Active motion**
Reflex irritability	**No response**	**Grimace**	**Crying**
Colour	**Blue or pale**	**Body pink, extremities blue**	**All pink**

INCLUSION CRITERIA	EXCLUSION CRITERIA
Primiparous or multiparous pregnancy Spontaneous or induced labour Women without obstetric complications such as pre-eclampsia or complex presentations including breech or twins Any type of epidural administration compared with any form of analgesia not involving regional blockade or compared with no analgesia.	ABSOLUTE Infection over the injection site, Coagulopathy, Marked hypovolemia, True allergies to local anaesthetics Patients refusal or inability to cooperate for regional anaesthesia. RELATIVE Preexisting neurological disease, Back disorders Severe mitral stenosis, Severe aortic stenosis

DISCUSSION

Optimal analgesia for labour requires neural blockade at the T10 to L1 in the first stage of labour and T10 to S4 for the second stage. Catecholamine alpha receptor stimulation causes uterine hyper tonicity, and beta receptor stimulation decreases uterine tone and contractility. Theeffect of epinephrinecontaining solution on the course of labour is somewhat controversial because of concern that the solution may slow the progress of labour or adversely affect the fetus Studies comparing these various agents have failed to find any difference in neonatal Apgar scores, acid base status or neurobehavioral evaluation. Epidural analgesia without adrenaline may (a) reduce effect of circulating catecholamines causing uterine hypo and hyper activity, and (b) change in coordinate uterine activity to a normal labour pattern. Allowing an epidural to wear off during second stage increases circulating catecholamines, leading to impairment of uterine activity and a longer second stage.

Parameters	No of trials	Results: Epidural vs Non epidural
Vomiting	1	No difference 3/25 vs4/25
Maternal hypotension	1	Significant difference 5/25 vs 1/25
Progress of labour	4	prolonged stage one and two with epidural 16/100 vs 4/100
Oxytocin use	5	Increased need with epidural 25/125 vs 13/125
Surgical amniotomy	1	No difference 1 5/25 vs 19/25
Motor blockade	1	Significant difference 7/25 vs 0/25
Foetal heart rate abnormality / meconium passage	5	No difference 25/1 25 vs 34/1 25
Fever	1	Significant difference 3/25 vs 1/25
Malposition	3	Significant difference 1 1/75 vs 6/75
Instrumental vaginal delivery	5	Small difference 30/125 vs 25/125

Caesarean section/ Dystocia	5	Small difference 24/125 vs 18/125
Apgore scoring	1	No difference 6/25 vs 8/25 Increased rate of hypoglycemia with epidural

Epidural anaesthesia is typically administered only when labour is well established, it may be advantageous to place an epidural catheter only when the patient is comfortable and can be positioned easily but local anaesthetic shoud generally only be administered when labour is progressing well and the patient becomes uncomfortable.Epidural anaesthesia is often administered earlier to parturients who are receiving an oxytocin infusion once a good contraction pattern is achieved. Moreover, some evidence suggests that epidural analgesia can be started as early as after 3 cm cervical dilatation in primiparous women without increasing the incidence of a cesarean delivery or need for oxytocin augmentation. Removal of the urge to push and perineal muscle relaxation by epidural analgesia may slow internal rotation and descent of the fetal head. The use of dilute concentrations of local anaesthesia with/without Opioids provides less motor blockade. Some local anaesthetics preferentially block motor over sensory fibres .In spite of its potential for cardio toxicity, bupivacains long duration of action makes it a popular agent for labour. Ropivacaine may be preferable because of less motor blockade and less cardio toxicity. Experience with levobupivacain is limited. Opioids alone (epidural or parenteral) reduce somatic block but provide inadequate maternal analgesia, increase gastric stasis and fetal depression. Epidural Opioids increase duration of active phase of stage[1]. Epidural clonidine and fentanyl, when used alone, preserve motor function but analgesia is inadequate. Epidural analgesia eliminates the labour stress like increase in cardiac output, heart rate and blood pressure caused by pain

Predictably, intrathecal bupivacaine in addition to or instead of, epidural bupivacaine reduces the required dose for labour analgesia but does not reduce the degree of motor blockade or the duration of the second stage. Labours are not always comparable to controls. Onset of labour before or after 37 weeks, duration of active stage, posture of mother during second stage, timing and dose of oxytocin, prostacyclin, rupture of membranes all affect duration of second stage. Similar definitions are required between study-and control groups of beginning of second stage (full cervical dilatation, or appearance at introitus of presenting part).

Epidural blockade of pelvic autonomic nerves may abolish the increment in oxytocin levels that occurs normally between full cervical dilatation and crowning of the fetal head. Oxytocin is claimed to be crucial to correct rotation and descent of fetal head but does not correlate with uterine contractility or spontaneous delivery. Plasma oxytocin levels have questionable clinical significance.

Reduced uterine perfusion has been blamed due to aortocaval compression and not epidural blockade even in the absence of demonstrable hypotension. If the intravenous fluid load prior to an epidural is administered as a bolus, rather than at a maintenance infusion rate, a 20 minute decrease in uterine activity results. The bolus transiently inhibits posterior pituitary production of antidiuretic hormone and perhaps of oxytocin.

While the need for instrumental vaginal delivery will decline as motor power is retained, this effect can exert only a minor influence until all other factors influencing second stage duration are better understood. Labour is unpredictable and influenced by many factors. Anaesthetic technique can affect the course of fetal descent and delivery but judicious obstetric and anaesthetic management provide safe maternal and fetal care without excessive prolongation of labour.

CONCLUSIONS

Epidural analgesia is an effective method of pain relief during labour. Further research is needed to define the adverse effects more accurately, particularly potential long-term adverse effects, and to evaluate different regional analgesia techniques. Labour is unpredictable and influenced by many factors. Anaesthetic technique can affect the course of fetal descent and delivery but judicious obstetric and anaesthetic management provide safe maternal and fetal care without excessive prolongation of labour.

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