

To Study the Safety and Efficacy of Epidural Analgesia for Labour

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ABSTRACT

Objective: To study the safety and efficacy of epidural analgesia for labour in our population

Material & method: Record of epidural analgesia for labour pain at Hameed Latif Hospital for the year 2006 was retrieved from the prescribed proforma filled in by the anaesthesia residents for every patient. Data retrieved was fed in SPSS version 13.0 and was analyzed.

Results: After reviewing the record of 1000 patients receiving epidural analgesia for labour pain following frequency distribution of complications was found: Numbness (16.4%), Shivering (7.8%), Blood tap (7.1%), Hypotension (2.5%), Dural tap (2.3%), Nausea & vomiting (2.1%), Urinary retention (2.0%), Backache (1.5%), Headache (1.4%) and Paresis (1.0%).

Conclusion: Epidural analgesia during labour is an effective and safe method for providing pain relief.

Key words: Efficacy, labour, epidural analgesia

INTRODUCTION

Most women experience moderate to severe pain during labour.¹ This can be very distressing especially if the labour is prolonged. There are various methods of providing pain relief during labour. The ideal labour analgesia technique should dramatically reduce the pain of labour, while allowing the parturient to actively participate in the birthing experience. In addition, it should have minimal effects on the parturient, foetus and the progress of the labour.

Of all the possible methods of pain relief which can be used, neuraxial blockade provides the most effective and least depressant analgesia. Epidural analgesia is one of the most commonly used neuraxial blockade. Well-conducted epidural analgesia in addition to relieving pain and anxiety is beneficial to mother and foetus. Excellent continuous analgesia during labour can be provided with the help of an epidural catheter², which can also be used to provide surgical anaesthesia if operative delivery is required. Objective of epidural analgesia is to provide pain relief without undesirable motor and autonomic side effects. Concomitant use of epidural-opioids reduces the requirements of the local anaesthetics decreasing the frequency and severity of hypotension and motor blockade.³

Besides some technical difficulties some of the known complications of this technique are dural tap, intravascular injection, hypotension, nausea, vomiting, numbness, paresis, motor blockade, urinary retention and inadequate analgesia.^{4, 5, 6} Audits are carried out to evaluate the impact of the departmental

protocols on outcome.^{7,8} We undertook a study of 1000 patients opting for epidural analgesia for labour pains during the period 2006 in our patients at Hameed Latif and Allied Hospitals, with the aim of improving the overall management of epidural analgesia for labour.

MATERIAL AND METHODS:

An average of 55 obstetric epidurals per month is conducted in our department. Annual average is more than 600 epidurals every year. Taking into account problems like lost data or incomplete follow up, we studied the frequency of complications in 1000 patients opting for epidural analgesia for labour pains

Record of epidural analgesia for labour pain at Hameed Latif and Allied Hospitals for the year 2006 was retrieved from the prescribed proformas filled in by the anaesthesia residents for every patient. A blank copy of the proformas is attached.

All the above-mentioned information will be fed into the Statistical Package for Social Sciences version 13.0. After defining the variables, the master sheet was developed. The data was cleaned and analyzed.

Epidural catheters were inserted in all patients that were willing for epidural analgesia under sterile conditions by one of the Consultant Anaesthetist on call. During the procedure pulse and blood pressure were monitored. After giving test dose blood pressure and motor blockade is checked. Analgesic dose was given if excessive blockade did not occur. Blood pressure and pulse of the patient was monitored for 15 minutes after each dose.

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RESULTS

After reviewing the record of 1000 patients receiving epidural analgesia for labour pain we found out the frequency distribution of following complications as given below in table 1:

Table 1: Frequency of complications

Complication	Total	%age
Numbness	164	16.4
Shivering	78	7.8
Blood Tap	71	7.1
Hypotension	25	2.5
Dural Tap	23	2.3
Nausea & Vomiting	21	2.1
Urinary Retention	20	2.0
Backache	15	1.5
Headache	14	1.4
Paresis	10	1.0
Pruritis	0	0

Numbness was reported in 164 patients out of 1000. Relationship with the dose concentration is shown in table 2 below:

Table 2: Dose/numbness crosstabulation (n=164)

Dose	Patients developing numbness	%age
0.0625% Bupivacaine n=8	0	0%
0.1% Bupivacaine n=974	146	14.9
0.125% Bupivacaine n=18	18	100

Shivering was the second most commonly occurring complication. It was recorded in 78 patients. 71 patients had blood tap while placement of catheter. In 2006 we started using 5 mls of normal saline before threading the catheter. This reduced our number of blood taps during catheter insertion from 47 in 2004 to 24 in 2006. This is about 100% decrease in blood taps.

Significant hypotension requiring treatment was recorded in 25 patients. 21 out of these were given 0.1% 20 ml bupivacaine while remaining 4 received 0.125% 20ml bupivacaine. 12 patients had associated nausea and vomiting. All the patients opting for epidural analgesia are preloaded with 1000 mls of crystalloid solution. 23 patients had dural taps. 10 out of these developed postdural puncture headache. Out of 643 epidurals given by consultants dural tap occurred in 15 patients. On the other hand in 357 epidurals given by senior Registrars dural tap occurred in 8 patients. Relationship between the experience of the anaesthetist and dural tap is shown below in table no: 3. Considering time of day, out of 318 epidurals performed by night consultants or senior registrars 9 patients had dural tap as

compared to 682 epidurals and 14 dural taps as shown in table 4 below.

Table3: Experience of anaesthetist/dural tap crosstabulation

Experience of anaesthetist	n=	Dural taps	Cases: Dural tap ratio
Consultants	643	15	42.87
Senior registrars	357	8	44.625

Table 4: Dural tap/time of day crosstabulation

Time of day	=n	Dural taps	Cases: Dural tap ratio
Day time	682	14	48.7
Night time	318	9	35.3

Nausea alone occurred in 8 patients while nausea along with vomiting was recorded in 13 patients. 5 of these patients received opioids epidurally with the dose. 12 out of these developed associated hypotension requiring treatment.

Urinary retention was reported in 20 patients following epidural analgesia for labour. 13 patients with urinary retention received 0.1% dose while 7 patients received 0.125% dose. Headache was reported in 14 patients. 10 of these patients had dural tap. 9 out these also had significant hypotension requiring treatment.

Backache was reported in 15 patients. Paresis was reported in 10 patients. All patients received dose of 0.1% 20 mls of bupivacaine. Pruritis was not reported in a single case out of 1000 cases. 211 patients out of these received epidural opioids. 5 of these patients developed nausea and vomiting. 8 of these patients developed urinary retention. No maternal respiratory depression was reported. Furthermore Apgar scores of the newborn were followed and no depression of the newborn was found. Sitting position was predominantly used for administration of epidural by anaesthetists. Exact numbers are given in the table 5 below:

Table 5: Positions used

Position	=n
Sitting	835
Left Lateral	159
Right Lateral	6

Average skin to epidural space distance, average fixation and average catheter in the space are given below in table 6:

Table 6

Average skin to epidural space distance	4.478
Average fixation	8.495
Average catheter in space	4.017

Relief of the patient was recorded as given in table 7 below:

Table 10: Pain relief scoring

Relief	=n	%age
No analgesia	8	0.8
Patchy analgesia	3	0.3
Partial analgesia	53	5.3
Feeling of pressure	52	5.2
Complete analgesia	884	88.4

Three concentrations of doses were used as shown in table no: 8 below:

Table 8: Doses used

Dose	=n	%age
0.0625% Bupivacaine	8	0.8
0.1% Bupivacaine	974	97.4
0.125% Bupivacaine	18	1.8

Table 10: Pain score/ satisfaction crosstabulation

Pain score	Not satisfied	Some pain relief; multiple complaints	Good pain relief; some complaints	Fully satisfied	Total
No analgesia	6	0	0	2	8
Patchy analgesia	1	0	1	1	3
Partial analgesia	2	3	11	37	53
Feeling of pressure	4	6	10	32	52
Complete analgesia	3	7	2	872	884
Total	16	16	24	944	100

In 968 patients 16 size needles were used while in 32 patients 18 size needles were used. In 2006, for identifying space (loss of resistance) air was used in 453 patients while normal saline was used in 47 patients. Prior to that air was used in all the patients. Another practice that we adopted was that we started injecting 5 mls of normal saline before placing the catheter in the space.

DISCUSSION

Incidence of unwanted side effects in women receiving epidural analgesia for labour has been reported to about 38% in international literature⁸. In our population unwanted side effects were reported in 44% of the cases.

Numbness was reported in 164 patients out of 1000. 8 patients that received 0.0625% dose did not develop numbness, the pain scores and patient satisfaction was comparable in this group but it is a very small number to draw any conclusions. By decreasing the concentration of the local anaesthetic the incidence of numbness may be decreased. Dilute solutions of epidural bupivacaine combined with opioids have been used to minimize the unwanted local anaesthetic effect of motor block⁹.

Shivering was the second most commonly occurring complication. It was recorded in 78 (7.8%) patients. Buggy D et al¹³ reported 30% incidence of shivering in women during labour with epidural analgesia. They proposed a nonthermogenic

Satisfaction of the patients with the services provided was recorded as given in table no: 9 below:

Table 9: Satisfaction grades

Satisfaction grade	=n	%age
Not satisfied	16	1.6
Some pain relief; multiple complaints	16	1.6
Good pain relief; some complaints	24	2.4
Fully satisfied	944	94.4

Relationship between the pain relief score and satisfaction of the patient from the services provided is given in table 10 below:

mechanism for this. Shivering was managed by covering the patient with blankets and by giving heat by use of heaters and warm fluids. Although there is no study that supports use of these measures, our patients experienced a relief from the symptom.

Accidental puncture of a vein occurs in 9% to 20% of obstetric cases, while intravenous positioning of the catheter has been estimated to occur in approximately 5%-16% of cases. Blood tap occurred in 71 patients while placement of catheter in our population that was 7.1%. Injection of a sufficiently large volume of epidural fluid before catheter threading decreases the incidence of accidental venous catheter placement during epidural anesthesia¹⁴. We introduced the practice of injecting 5-7 mls of normal saline before catheter insertion and thus were able to reduce the number of cases from 47 in 2004-05 to 24 in 2006.

Nausea alone occurred in 8 patients while nausea and vomiting was recorded in 13 patients. Although frequency of nausea and vomiting with use of opioids in epidural analgesia was reported to be as high as 30-65%¹⁵, our study showed the overall incidence to be around 2.1% while with use of opioids it was calculated to be around 2.36% that was much lower.

Urinary retention was reported in 20 patients following epidural analgesia for labour. Urinary retention is associated in literature with excessive blocks and can be prevented by use of low concentrations of dose²¹. 0.1% bupivacaine was

predominantly used therefore no relationship with dose could be established in our study.

Significant hypotension requiring treatment was recorded in 25 patients. 12 patients had associated nausea and vomiting. All the patients opting for epidural analgesia are preloaded with 1000 mls of crystalloid solution. Kinsella SM et al¹⁷ concluded that omitting preloading with IV fluids did not increase the incidence of hypotension but is protective against abnormal fetal heart rate. All our patients received preloading with 1L of crystalloid solution and we did not monitor fetal heart rate. Therefore no comment can be made on this. In all patients hypotension was managed with rapid IV crystalloids, boluses of IV ephedrine 5-10mg and left lateral positioning.

23 patients had dural taps. Headache occurs in approximately 80% of dural punctures¹⁸. Different prophylactic measures such as: small needle size, the use of Sprotte's needle, reinsertion of the stylet before withdrawing the needle, and direction of the brevel perpendicular to the dura, have all been shown to reduce the occurrence of PDPH. In ASA Refresher 2004 article "Epidural anaesthesia during labour: safety and success"¹⁹ it was reported that most dural taps occurred by inexperienced anesthetists and during early hours of morning. Furthermore they also reported that loss of resistance with saline instead of air is associated with decreased incidence of PDPH. The incidence of dural tap was higher at night time. blood patch was given in 8 of these patients. Rest of the patients were managed conservatively with bed rest, soft diet, good hydration and NSAIDs.

Backache was reported in 15 patients. Howell CJ in their controlled comparison of the long term effects of epidural and non-epidural analgesia found no significant differences in self reported low back pain or disability and in objective measurements of spinal mobility after more than two years. They concluded that after childbirth there were no differences in the incidence of long term low back pain, disability, or movement restriction between women who received epidural pain relief and women who received other forms of pain relief²⁰. The complaint of backache was followed till discharge of the patients and was managed with simple analgesics. Paresis was reported in 10 patients. All patients received dose of 0.1% 20 mls of bupivacaine.

Pruritis was not reported in a single case out of 1000 cases.

20 mls of 0.1% bupivacaine was the dose that was predominantly used (974). Sample size of other 2 doses used was too small to draw any conclusion or make any comparison.

The American College of Obstetricians and Gynecologists recommends that "when feasible, obstetrical practitioners should delay the administration of epidural anesthesia in nulliparous women until the cervical dilatation reaches at least 4.0 to 5.0 cm and that other forms of analgesia should be used until that time." This recommendation is based on studies that found an association between the initiation of epidural analgesia early in labor and an increased rate of cesarean delivery²¹. 144 patients who had C-section had cervical dilatation of 4 or less that is about 94.7% of that population supporting the international data.

94.4% of the patients were fully satisfied by the services provided while 3.2% of the patients were not satisfied or had multiple complaints. Although pain relief has major contribution to satisfaction of the patient, 62% (72 out of 116) of the patients who had no pain relief, patchy or partial analgesia were fully satisfied with the services provided to them. Likewise in 32 patients who were either not satisfied or had multiple complaints, only 37.5% (12 out of 32) had no pain relief or partial or patchy analgesia. Moreover 10 patients who had complete pain relief were not satisfied or had multiple complaints by the services provided.

CONCLUSIONS

We found our practice of epidural analgesia for labour to be as safe and efficacious as reported in the International literature. Incidence of almost all the complications was found to be either lesser or comparable to that reported in literature. Patient satisfaction rates and failure rates were also found to be comparable with International data. Further areas for follow-up studies were identified for added improvement in the safety and efficacy of the practice of epidural analgesia for labour.

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