The Safety of Epidural Analgesia in Labour and its effect on Delivery - A Case Control Study in Pakistani Women

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Abstract

To assess the safety and effect of epidural analgesia on the course of labour and delivery in Pakistani women, a retrospective case control study was conducted from November, 1986 to November, 1991 (5 years) at the Aga Khan University Medical Centre, Karachi. All patients (n=64) who received epidural analgesia for labour (cases) were compared with randomly selected patients (nd 8) who did not receive epidural analgesia during labour (controls). The cases and controls were matched for age, height, body mass index, parity, use of oxytocin, presentation and weight of the foetus. There was no significant difference (P>0.05) between the two groups in duration of labour; caesarean section rate and foetal apgar scores at 1 and 5 minutes after birth. The incidence of malposition of foetal vertex at delivery and that of instrumental (forceps) deliveries was significantly higher (P<0.05 and <0.01 respectively) in the epidural group as compared to controls, The incidence of complications was low and the acceptance and tolerance of epidural analgesia was good in our patients (JPMA 43:115, 1993).

Introduction

Epidural analgesia during labour has been in use for decades[1]. The advantages of regional blocks include improved quality of pain relief, control of hypertension and ease of obstetric manipulation in second stage[2]. Besides the complications of the anaesthetic technique, e.g., dural puncture, total spinal, urinary retention, hypotension, toxicity of analgesic agent used[1], epidural blocks in obstetrics practice have been shown to be associated with increase in incidence of foetal malposition and instrumental deliveries[3,4]. In Pakistan the experience with this mode of pain relief and its effect on the course of labour and delivery is limited, probably due to the belief amongst patients and physicians alike, that despite its established safety within western hospital practice, epidural analgesia continues to be a difficult and dangerous technique in the third world. Moreover, its safe conduct necessitates the presence of an experienced 24 hours obstetric anaesthetic service not committed to other duties, which is very demanding in face of shortage of trained anaesthetists. At the Aga Khan University Medical Centre, Karachi, epidural analgesia has been used in labour sporadically. By now we have collected enough cases to study the effectiveness and complications of this procedure in the local population. In this study, we are presenting the results of data collected between November, 1986 and November, 1991.

Subjects and Methods

After obtaining institutional approval, charts of all patients having epidural analgesia for pain relief were reviewed. These 64 patients constituted the epidural group. During the same time period a total of 6741 patients delivered. Of the 6677 patients who did not have epidural analgesia during labour, a control group of 118 patients ‘was selected randomly after excluding patients delivered by elective caesarean section. The majority of patients who received epidural analgesia were offered this mode of

pain relief primarily on their own request. The procedure was explained to these patients and written Consent obtained. After exclusion of any contraindications the patients were prehydrated with 500 cc of lactated Ringer's solution. A cardiotopographic foetal heart rate trace was obtained to rule out any evidence of foetal distress. Blood pressure and pulse was recorded. With the patient in left lateral or sitting position the epidural space was entered at the L 2-3 or L 3-4 interspace with 16-gauge Touhy needle using the loss of resistance technique. An epidural catheter was advanced 2-4 cm into the epidural space and the Touhy needle was withdrawn. A bacterial filter was attached to the other end of the epidural catheter and a 2 ml test dose of 1% plain lignocaine solution was administered. When correct placement was confirmed, the first dose of Bupivacaine solution was administered. The concentration of the solution was 0.25-0.5%, based on patient's response. Five- eight mls were instilled with the patient in the left lateral position where the patient was kept for 5 mm. after this dose. Then the patient was turned to right lateral position and a further 5-8 mls of Bupivacaine was injected. The patient was kept in this position for 5 min. Subsequent top ups were administered in the same fashion. Blood pressure and pulse were monitored at 5 mi intervals for half hour and then half hourly throughout labour. The patient was not allowed to lie straight on the back. The management of labour in the epidural group and the control group was uniform in accordance with our manual of labour ward management[5]. The parameters studied in both groups were age, height, weight, parity, presentation of foetus, gestational age at delivery, duration of labour, position of foetal vertex at delivery, mode of delivery, birth weight of neonate and its apgar scores at one and five minutes. Any complications of epidural analgesia were recorded in the cases. The Chi-square test with yates\'s correction and the Students t-test were used for statistical analysis of difference between epidural and control groups.

Results

Table I. General characteristics of women with epidural analgesia and controls.

Characteristics #	Epidural group (n=64)	Control group (n=118)
Age in years mean ± SD	26.2±4.1	27.3±4.9
Height in cm. mean ±SD	155±6	156±5
Body mass index in Kg/cm^2 $ mean ± SD	23.9±3.2	23.1±3.4
Gravidity n (%)		
Primi.	46 (71.8%)	73 (61.8%)
Multi.	18 (28.2%)	45 (38.2%)
Presentation n (%)		
Cephalic	60 (93.4%)	112 (95.0%)
Breech	4 (6.6%)*	6 (5.0%)+
Birth weight in kg. Mean±SD	3.1±0.23	3.2±0.26

\# No significant difference (P>0.05) in any of these characteristics between epidural and control groups.

$ Calculated at initial visit, only for those who booked in antenatal clinic before 14 weeks gestation.

* 2 vaginal deliveries and 2 caesarean deliveries.

\+ 2 vaginal deliveries and 4 caesarean deliveries.

Table I shows the characteristics of patients receiving epidural analgesia (cases) and those without (controls). The groups were closely matched for age, height, weight, presentation and gestational age. There was a higher percentage of primigravida in the epidural group but statistically the difference with control group was not significant (P>0.05).

Table II. Effect of epidural analgesia on duration of labour and on foetal apgar scores.

	Epidural group Mean ± SD	Control group Mean ± SD
Duration of labour (hrs.) +		
1st stage*	6.29 ± 4.12	5.65 ± 3.15
2nd stage*	0.32 ± 0.27	0.29 ± 0.24
Apgar score (out of 10)$		
1 min. after birth*	7.36 ± 1.75	7.16 ± 1.75
5 min. after birth*	8.85 ± 0.81	8.69 ± 1.28

* No statistically significant difference (P > 0.05) between cases, i.e., those with epidural analgesia and controls, i.e., those without epidural analgesia.
\+ Epidural group n = 58, control group n = 102 (subjects delivered vaginally).
$ Epidural group n = 64, control group n = 118 (all subjects).

Table II shows that durations of labour and foetal apgar scores were not significantly different in cases and controls. The use of oxytocin in the two groups was not found to be different (P> 0.05).

Table III. Position of vertex at the end of 2nd stage of labour and the mode of delivery.

	Epidural group No.	%	Control group No.	%
Foetal position at the end of second stage $				
Occipito-anterior	42	(75.0)	93	(93.0)
Occipito-transverse +	7	(12.5)	1	(1.0)
Occipito-posterior +	7	(12.5)	6	(6.0)
Mode of delivery*				
Vaginal (spontaneous)	26	(39.6)	71	(60.1)
Forceps**	32	(50.0)	28	(23.8)
Caesarean section + +	6	(9.4)	19	(16.1)

$ Epidural group n = 56, control group n = 100 (cephalic presentation only).
\+ Significantly higher rate of foetal malposition, i.e., occipito-transverse and occipito-posterior position in epidural group (P < 0.01).
* Epidural group n = 64, control group n = 118.
** Significantly higher rate of forceps delivery in epidural group (P < 0.05).
+ + No significant difference (P > 0.05).

Table III shows that rate of forceps delivery in cases was 50% as compared to 24% in controls (P>0.05). Primigravid patients were twice as often delivered instrumentally than multigravid patients in both groups. The rate of foetal mal position in cases was 25% as compared to 7% in controls (P <0.01). The frequency of malposition was not affected by parity. In patients with epidural analgesia 10 patients had minor complications like headache (2 cases), urinary retention (4 cases) and backache (4 cases). Major complications, i.e., dural tap and unblocked segment were noted in 2 patients each. The quality of analgesia was evaluated as good by all patients.

Discussion

Epidural analgesia is a relatively new mode of pain relief in labour for Pakistani women. The use of epidural analgesia is on the increase because it is more effective and results in greater patient satisfaction than other methods used alone or in combination[6]. It allows the woman to remain aware and awake and it can be used throughout parturition even if caesarean section is required[7]. With increasing awareness amongst patients in developing countries, there is a growing demand to provide epidural blocks. The documentation of experience with this form of pain relief in labour in women from developing countries is limited. Our series, though small, is an initial step in the evaluation of safety and effect of epidural analgesia in labouring Pakistani women in a tertiary care setting in Karachi. In this study the rate of anaesthetic complications was acceptably low and quality of analgesia good. The duration of labour was not significantly longer in the epidural group (Table II) despite the higher percentage of primigravidain this group (Table I). This result was not influenced by oxytocic use. Foetal outcome as assessed by apgar scores (Table II) was unaffected by use of epidural block. These findings are in conformity with those from studies in the West[7] as well as that of Chinese women[4]. The higher rate of instrumental delivery (Table III) is also in conformity with findings of other studies[1-4,7]. The increase in instrumental delivery is usually attributed to inability of the mother to push well in second stage as well as to higher rate of malposition. In our series the malposition rate of 25% was similar to that noted by Hoult et al[3] in the U.K. and Lao et al[4] in Chinese women. This rate was significantly higher than in the control population (Table HI) and is, therefore, likely to have contributed to the higher instrumental delivery rate. The increase in malposition rate in the epidural group is probably due to the decrease in tone of the pelvic floor muscles as a result of lumbar epidural block. This interferes with the normal mechanism of labour in that the occiput will not be so easily rotated anteriorly when the presenting part is pushed against the gutter normally formed by the unrelaxed levator ani muscles. Eighty percent of patients in our series with mal position had a Kjelland's rotation forceps delivery. An epidural block facilitates such manipulation because of good analgesia and pelvic floor relaxation. However, rotational forceps are associated with high maternal and foetal morbidity. In our series none of the babies delivered with rotational forceps required admission to Neonatal Intensive Care Uflit. There is an increasing concern that use of epidural analgesia may increase caesarean. section rates[8,9]. However, this was not the case in our series where caesarean rates were not significantly different (P> 0.05) in the epidural and control groups (Table III). This result is in conformity with the findings of Gribble and Meier[10]. Epidural analgesia, in our series, was found to be safe and effective but it was associated with a higher incidence of assisted vaginal delivery. When giving epidural analgesia to patients in labour electively, this risk should be made abundantly clear, i.e., the anaesthetic safety of epidural analgesia should be weighed against the obstetric risks of instrumental delivery. Although the study size is small, it seems that in the presence of an obstetric anaesthetic service the technique of epidural analgesia is acceptable in Pakistan.

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