

THE EFFECT OF INTRAPARTUM EPIDURAL ANALGESIA ON NULLIPAROUS LABOR

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ABSTRACT

Our purpose was to determine the effect of epidural analgesia on nulliparous labor and delivery. Normal term nulliparous women in spontaneous labor were divided into two groups in a quazi-experimental study, 100 in each group. The first group received epidural analgesia and the second had no analgesia at all. In the first group, an epidural catheter was placed in 3-4 cm cervical dilatation and the first dose of lidocaine 1% was injected in 5-cm cervical dilatation. The next doses were injected according to certain criteria. Then data were collected and analyzed by EPI-6.

There was no significant difference in cesarean rate in both groups (10% in the first group vs. 5% in the second one, $p>0.10$) including cesarean for dystocia and fetal distress. Also, there was no significant difference in the variable of spontaneous vaginal delivery between both groups (89% in the first group vs. 94% in the second one, $p>0.10$). Occurrence of instrumental vaginal delivery was the same in both groups, no forceps, and one vacuum-assisted in each group. Also there was no significant difference in the second stage of labor between the groups (less than 1 hour: 79% in the first group vs. 81% in the second group, $p>0.10$; more than 1 hour: 11% in the first group vs. 14% in the second group, $p>0.10$).

Epidural analgesia results in no significant difference in the course of labor and delivery in normal term nulliparous women and is a safe method of pain relief in these patients.

MJIRI, Vol.18, No.3, 243-246, 2004.

Keywords: Analgesia, Epidural /Analgesia, Obstetrical /Labor, Nulliparous.

INTRODUCTION

Epidural analgesia is a safe and effective method of pain relief during labor. However, its effect on nulliparous labor and delivery remains controversial. For a long time, some believed that epidural analgesia prolongs the first stage of labor, especially if administered in the latent phase.¹⁻³ Also, some studies show an increase in malposition and cesarean section for dystocia following epidural

analgesia.⁴ However these results and also the effect of epidural analgesia on instrumental delivery remains controversial. The effect of epidural analgesia on the fetus is also important.

MATERIAL AND METHODS

After approval by the research committee of Hamadan University of Medical Sciences, this study was conducted

Effect of Epidural Analgesia on Labor

in Fatemeh Hospital in Hamadan. In this study, 200 patients were divided into two groups, 100 patients in the analgesia receiving group (first group), and 100 patients in the control group (second group). To follow the principles of morality, we grouped the patients based on their satisfaction but not randomized, and the study was quasi-experimental. In this study, patients meeting the following criteria were invited to participate in the trial: uncomplicated, term, singleton gestations (38-41 weeks), mother's age between 15-30 years old, nulliparity, occiput anterior and transverse fetal positions but other positions were considered abnormal.

At first the indication of vaginal delivery was approved by the obstetrician or chief resident and then the absence of systemic diseases and conditions such as pelvic abnormality which confuse the study results were approved by a questionnaire containing history and physical examination. An epidural catheter in the first group was placed in 3-4 cm cervical dilatation, diagnosed by the obstetrician or chief resident and analgesia administration started at 5-cm dilatation. To place the epidural catheter, the patient was placed in sitting position and using the midline approach, the catheter was placed through the L₂-L₃ interspace, about 3cm in the epidural space. As using Bupivacaine in pretest cases caused inevitable acceleration of delivery stages, during the study, only Lidocaine 1% was used. To dilate the epidural space and facilitate catheter placement, and before injecting Lidocaine, 10^{cc} distilled water was injected into the epidural space. The criteria for initial (first stage) injection were: presenting part engagement, 5 cm dilatation, the least contraction duration of 20 seconds, and maximum contraction intervals of 10 seconds.

The anesthesia level was between T₁₀-L₁ segments. Repeated injection was according to the patient's request. The criteria of the second stage labor were: at least +1 station, 100% effacement, full dilatation, contraction duration of more than 30 seconds, contraction intervals of 3 minutes or less, perineal projection, feeling of fetus emergence by the parturient, complement of fetal head flexion and internal rotation. Oxytocin was used equally and as the routine for two groups.

Statistical methods were performed using Student's *t* test, chi-square and Fisher *t* test.

RESULTS

The purpose of this study was to determine the effect

of epidural analgesia on nulliparous labor. In this study, 100 patients were in the analgesia group (first group), and 100 in the control group (second group), each group consisting of 50% of the patients. The patients were nulliparous women referred to Fatemeh Hospital in Hamadan for delivery. These patients entered the trial according to certain criteria and their own satisfaction. Table I shows the comparison of patients in these groups. According to this table, there is no significant difference in variables of maternal age and weight, gestational age and cervical dilatation during admission ($p>0.10$). Data are reported as mean \pm 1 SD. Table II shows the comparison of the course of labor and delivery in patients in two groups. Total patients with cesarean delivery in the first group were 10 (10%) vs. 5 (5%) in the second one with no significant difference ($p>0.10$). Six patients (6%) in the first group and 2 patients (2%) in the second one had cesarean section for dystocia. Also, 4 patients (4%) in the first group and 3 patients (3%) in the second one had cesarean section for fetal distress with no significant difference either ($p>0.10$). The variable of spontaneous vaginal delivery showed no significant difference between the two groups with 89 patients (89%) in the first group and 94 patients (94%) in the second one.

Instrumental vaginal delivery was compared between these groups too. There was no case of forceps-assisted vaginal delivery in them and only 1 case (1%) of vacuum-assisted vaginal delivery in each one with no difference. A second stage of labor duration of more than two hours is considered abnormal for nulliparous patients and there was no such case in this trial in them, but in the first group 11 patients (11%) had such a duration of more than one hour and 79 patients (79%) had a duration of less than one hour. On the other hand, in the second group, 81 patients (81%) had a duration of less than one hour and 14 patients (14%) had more than one hour. There is no significant difference in this variable ($p>0.10$).

DISCUSSION

Epidural analgesia has been used as an effective method for labor pain relief worldwide for many years. But in our country, for some reasons such as unawareness of obstetricians and anesthesiologists and also reports of its unwanted effects, this method has never been used widely. This is the first controlled prospective study in our country with the aim of removing these obstacles. In the trial conducted between 1990-1992, Thorep et al. and his

Table I. Comparison of patients in epidural and control groups.

Variable	Epidural group (n=100) (Mean ± S.D)	Control group (n=100) (Mean ± S.D)	P value
Maternal age (yr.)	20.45 ±3.98	20.8 ±3.32	p= 0.45 (NS) *
Maternal weight (kg)	63 ±8029	62.3 ±7.34	p= 0.25 (NS) *
Gestation (wk)	39.5 ±1.15	39.6 ±1.05	p= 0.51 (NS) *
Cervical dilatation on admission (cm)	4.4 ±0.71	4.35 ±0.75	p= 0.73 (NS) *

* Non-significant

Table II. Comparison of course of labor and delivery in patients in epidural and control groups.

Variable	Epidural Group (n=100)	Control Group (n=100)	P value	
Total cesarean delivery	10	5	p = 0.26 (NS) *	
Cesarean section for dystocia	6	2	p = 0.60 (NS) *	
	Cesarean section for fetal distress	4		3
Spontaneous vaginal delivery	89	94	p= 0.73 (NS) *	
Vacuum-assisted vaginal delivery	1	1	(NS) *	
Second stage of labor	Less than 1 hour	79	81	p= 0.77 (NS) *
	More than 1 hour	11	14	

* Non-significant.

co-workers studied the effects of epidural and narcotic analgesia on nulliparous labor. They stated: "Epidural analgesia in nulliparous labor is associated with a significant increase in cesarean delivery. This increase is because of dystocia. Epidural analgesia is also associated with longer first and second stages of labor, slower rates of cervical dilatation, and more frequent malpositions of the fetal head. These findings support the previous studies contending that the dramatic rise in the use of epidural analgesia labor has made significant contributions to the cesarean epidemic."⁴ Some physicians suggested that early epidural analgesia results in pelvic floor relaxation, which may interfere with internal rotation of the fetal head during labor resulting in increasing malposition frequency.⁵⁻⁸ Our study shows no significant difference in the variables of cesarean frequency and its causes, spontaneous vaginal delivery, instrumental vaginal delivery and duration of the second stage of labor in the epidural analgesia-receiving group vs. control group. The reason for the difference between our study and other studies can be related to the time of epidural catheter placement and drug administration. In our study, an epidural catheter in the first group was

placed at 3-4 cm dilatation and the first analgesic dose administered at 5 cm dilatation. A significant correlation between cervical dilatation at epidural placement and risk of cesarean birth has also been noted in a previous retrospective study.⁵ The risk of cesarean section for dystocia was 28% if the epidural catheter was placed at ≤ 3 cm of cervical dilatation, 16% if placed at 4 cm, and 11% if placed at ≥ 5 cm of cervical dilatation. Another study confirms this observation; also noting a significant increase in cesarean section the earlier the epidural catheter was placed during labor. The risk of cesarean delivery was 50% if the epidural catheter was placed at 2 cm of cervical dilatation, 33% if placed at 3 cm, and 26% if placed at 4 cm. There was no cesarean delivery in the group of patients having an epidural catheter placed at ≥ 5 cm of cervical dilatation.

The results of our study and other studies show that epidural analgesia in nulliparous women is associated with notable prolongation of the first and second stages of labor, increased frequency of oxytocin use, increased malposition incidence and notable increase in cesarean delivery for dystocia. These unwanted effects can be

Effect of Epidural Analgesia on Labor

removed by epidural catheter placement at ≥ 5 cm cervical dilatation.

To relieve pain up to this time, physicians can use suitable narcotics. As a result the pain will be relieved throughout labor.

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