

Lumbar Epidural Analgesia: Shortening Time of Active Phase at First and Second Stage of Labor

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ABSTRACT

Introduction: Pain is a cause of dissatisfaction in labor. The use of lumbar epidural analgesia (LEA) in labor is widespread due to its benefits in terms of pain relief and the shortening of labor time. The study selected 50 consecutive primiparous women in labor at Asri Medical Center. They were given explanations about the two options for pain relief (parenteral opioid /sedative or lumbar epidural analgesia and were grouped based on their pain relief preference. The epidural group received 0.125 plain bupivacaine, while other group received pentazocine intravenously. The mean of the first and second labor stage duration is shorter in the lumbar epidural group ($p = 0.01$ and $p = 0.02$). There was no difference in the rate of cesarean delivery, epidural analgesia (32% [8/25]), parenteral opioid / sedative (44% [11/25]), (OR = 0.60; 95% CI = 0.19-1.90). The closed questionnaire showed that the overall experience of labor was much better in the lumbar epidural group (80% versus 4%). It can be concluded that more primiparous women are satisfied with lumbar epidural analgesia more than those receiving parenteral opioids/sedatives.

Keywords: analgesia, epidural, labor, lumbar epidural, non lumbar epidural, primiparous

1. INTRODUCTION

Pain in the process of childbirth is the process most feared by every woman in her pregnancy. The existence of pain relief in an effective and safe delivery is a challenge in the present and future. Pain relief techniques that block neuroaxial are the gold standard as a pain reduction in labor.

The use of analgesia has been proven in the UK, around 100,000 women each year use it to relieve pain during labor(1). Childbirth is a painful period because of the external feeling that can be felt by women, more than 30% of women.

While there are still asynchronous results of several studies regarding the effects of using analgesia, some argue that their use can increase the incidence of cesarean section, and other opinions on the contrary(2) when an active phase in labor will occur thinning and widening of the cervix. During this process, there will be an increase in the frequency, duration and intensity of uterine contractions. From a study by it was found that in the first time of primiparous labor experienced severe pain due to uterine contractions which were not tolerable and unusually severe or even terrible. Labor pain is very individual and will be influenced by many factors such as experience of

previous pain, cultural background, tissue damage, history of illness, fear, anxiety, and depression that interact with each other(3) (4). Labor pain is a strong stimulus to cardiovascular and respiratory function. Pain can stimulate the sympathetic nervous system so that the amount of plasma catecholamines, Cardial output, and increased blood pressure. In labor, circulation of epinephrine and norepinephrine levels can reach 200% -600% with pain that is not handled consequently, an increase in then an increase in catecholamine causes a decrease in blood flow to the uterus. Severe labor pain, anxiety, and circulating catecholamine levels result in prolonged labor(4)(5) parenteral opioids / sedatives are often given to primiparous women at Asri Medical Center, and are clinically proven to be able to relieve pain during labor(6). This research aims to to explain labor research and primiparous women when given lumbar epidural analgesia or parenteral / sedative opioids at Asri Medical Center. Result of this research will will show that the time of active phase labor and second labor stage as well as the accept analgesia offered.

2. MATERIAL AND METHODS

After being approved by the research ethics committee and offering patients to become research respondents, 50 primiparous women who need pain relievers with ASA status 1 and 2. Respondent groups were divided into 2 groups based on their preferences, whether to get opioid / sedative pain relievers parenteral or lumbar epidural analgesia. Exclusion criteria included patients with ASA 2 or more, there was a possibility of cephalo pelvic disproportion and cervical opening ≥ 4 cm. The administration of drugs or the installation of lumbar epidural analgesia is performed by the anesthesiologist. Monitoring and evaluation are carried out by midwives under the supervision of obstetricians. Intrapartum monitoring is done routinely on all women who get one of the two therapies using cardiocograph to monitor uterine contractions and fetal heart rate. Delivery progress is done every 4 hours. If after administration of analgesia, the opening of labor is less than 1 cm per 2 hours, it is said that the progress of labor is slow.

Patient demographic data and vital signs are recorded and documented before labor begins. Childbirth is said to be successful using analgesia if it ends with vaginal delivery either spontaneously or by using a vacuum extraction device. And it is said to fail if labor ends with cesarean section for any reason. At the end of labor normally the midwife queries about satisfaction in labor using pain relief.

3. STATISTICAL ANALYSIS

The A descriptive statistical analysis was performed on demographic variables, while the length of labor was performed by t-test and chi-square analysis. Patients who want to change analgesia from opioids / sedatives to lumbar epidural analgesia will be excluded from respondents.

4. RESULTS

There were 50 primiparas included in the study analyzed based on their demographics, showing no significant differences in the epidural and non-epidural groups (age of the mother, age in pregnancy, presence of cervical dilatation, and birth weight of infants) ($p=0.80$; $p=0.60$; $p=0.60$; $p=0.33$).

Duration of labor in the active phase 1 phase in both groups is shown in table 2. The average time of delivery in the active phase 1 phase in the group using the lumbar epidural group was shorter ($p = 0.01$). Likewise, In stage two of labor the group who used the epidural lumbar average was shorter ($p=0.02$). Obtained data in groups using the epidural group require additional additional oxytocin to strengthen contractions compared to non-epidural groups. More vaginal deliveries occur in the lumbar epidural group. The number of cesarean births was also no significant difference in the two groups (32% [8/25]) and the group receiving parenteral opioids / sedatives (44% [11/25]) ($p = 0.06$; $RR = 0.79$ 95% CI, 0.57-0.940).

Table 1. Respondents

	LEG	Non LEG	p
Maternal Age	28,6±	24,1±	0.80
In Year	4.8	5.1	
Gestational Age	39.0±	38.8±	0.60
Cervical Dilatation	4.0	4.0	0.60
Birth Weights	2955,7±	3089.3±	0.33
(Grams)	417.5	304.5	

Mean ± deviation standard

LEG: Lumbar Epidural Group, Non LEG: Non Lumbar Epidural Group

The experience of patient satisfaction after delivery is shown in Table 3. Questionnaires were given after 2 hours of delivery. The epidural lumbar group as a whole was more satisfied (80% versus 4%). 68% of non-epidural women cannot remember the difference in pain between using analgesia and not using analgesia. Whereas in the epidural analgesia group 56% stated they could not remember the pain after being given lumbar epidural analgesia. 64% of women with lumbar epidural analgesia feel able to control their pain. In the non-lumbar group 52% felt unable to control pain. The non-epidural group still felt pain (64% vs 24%). The lumbar group also claimed to be able to sleep during labor, although not fully (48% vs 100%).

Table 2. Characteristics and Result

Variable	LEG	Non LEG	RR (95%CI)	P
Duration of active phase First stage (minutes)	183.9± 11.2	294.4± 25.1	1,5 (0,56-0,96)	0.01
Duration of second stage (minutes)	10.5± 4.8	20.5± 3.3	1,75 (0,54-0,89)	0.02
Oxytocin augmentation Delivery mode	10	3		
- Normal			0.79 (0,57-0,94)	0.60
- Emergency Caesarean section	17 (68%) 8 (32%)	14 (56%) 11 (44%)		

Table 3. Two-hours postpartum maternal questionnaire

	Epidural group	Non-epidural group
Labor experience		
- Worse	0	11(44%)
- As expected	5 (20%)	13 (52%)
- Better	20 (80%)	1 (4%)
How much pain you can remember?		
- No	14 (56%)	5 (20%)
- Same	6 (24%)	17 (68%)
- All	1 (4%)	3 (12%)
Can you control the pain?		
- I can't	2 (8%) 7 (28%)	13 (52%) 9 (36%)
- Same	16 (64%)	3 (12%)
- I can		

	Epidural group	Non-epidural group
Do you feel pain during labor?		
- Yes	6 (24%)	16 (64%)
- No	19 (76%)	9 (36%)
Can you sleep during labor?		
- Tidak	12 (48%)	25 (100%)
- Sufficiently	13 (52%)	0

2. DISCUSSION

Overall the epidural lumbar group got better results compared to the non epidural group. However, what became clinically important findings from this study was that the average time of labor in the first and second active phases in the epidural lumbar group was shorter than in the non epidural group or those using parental opioids / sedatives. Autonomic imbalance is the cause of the length of labor in epidural analgesia. Pain in labor is caused by a combination of stretching the lower uterine segment (hereafter the cervix) and ischemia (hypoxia) by the muscles of the uterus. As a result, it also explained why active phase and secondary stages in the LEA group was shorter than non LEA group. From systematic review and meta analysis which twelve studies and recruiting 16200 mothers overall, In the first stage, the duration of labor was significantly extended in the epidural group with an average of 2.66 (0.89, 4.43, $p < 0.00001$), and in the second stage it was shortened by an average of -12.79 (-21,13, -4,45, $p < 0,00001$)(7).

The authors had a relationship between various analgesia and the way to give the labor analgesia. Any changing of dose schemes was not performed. It was different from previous findings. There were a relationship between various first dose epidural schemes and changes in labor times. This behavior may be addressed to motor block, since proprioceptive perception of pelvis muscles are needed to coordinate pushing(8). Dilatation occurs more quickly in women who use analgesia because of the effects of the sympathetic system.

In this study, it was shown that oxytocin augmentation can increase maternal satisfaction during labor. Evidenced by the many requests for its use. In this study also showed that the mode of delivery in the two groups (epidural and non-epidural) there were no significant differences, although there were more cesarean deliveries in the non-epidural group. However, the use of epidural analgesia in labor still faces controversy in labor because it can prolong labor and consequently increase the rate of cesarean section. The use of analgesia in primiparas does not increase cesarean delivery. Our other findings, suggest that more use of bolus for epidural enesthesia top-up is needed, and the rate of cesarean delivery is also higher. At the duration of stage two, instrumental delivery, and patient presentation with an indication of cesarean section are irrelevant to the time that epidural analgesia begins (9). Early epidural analgesia can accelerate the active phase of the first stage of normal labor. Epidural technique was performed when the primiparous women entered active phase or the cervical dilatation were ≥ 4 cm and bolus dose was maintained until the end until the end of labor process without any top-up boluses.

Based on a closed questionnaire that we collected in postpartum women showed better results in the epidural group. So that more women choose to use analgesia to relieve labor

pain. In the non-epidural group felt unable to control labor, in contrast to the epidural group who felt unable to control labor (64%). Maternal satisfaction during labor is a measure of the reliability and reproducibility of obstetric care for medical specialties such as obstetric anesthesia.

In a closed questionnaire, researchers asked patients whether they were satisfied with the analgesia they had received. The results obtained are 56% satisfied and do not feel pain.

Maternal satisfaction at the time of labor includes labor, producing psychological responses and physical reflexes. The use of analgesia contributes greatly to that satisfaction. However, improving the quality of analgesia is not always in line with increased satisfaction. So, the satisfaction of women in childbirth consists of many different aspects from one another. Maternal satisfaction during labor is measured by its ability to control pain due to labor, whereas analgesia has not been fully felt successfully. However, in our study the use of lumbar epidural analgesia has provided an answer to that satisfaction and without finding any harm to our respondent patients. It was relevant with previous research that maternal satisfaction after the epidural analgesia for labour was high in their population. Maternal satisfaction was not affected by complications directly derived from the technique(10). In the analgesia group, felt satisfied because they did not have pain experience during labor. The benefits of using analgesia as a painkiller in labor will be greatly needed by hospitals to increase patient satisfaction.

6. CONCLUSION

It can be concluded that more primiparous women are satisfied with lumbar epidural analgesia more than those receiving parenteral opioids/ sedatives. The lack of our study is the study was non-randomized controlled study and the choice of technique depends on individual choice. Next researches are recommended to compare between primiparous and multiparous women, other regimens in analgesia, double-blinded methods.

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