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**Original Research Article**

# Evaluation of the Effects of Epidural Labour Analgesia on Mode of Delivery in 250 Bedded District Hospital, Bagerhat, Bangladesh

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## Abstract

***Background*:** Labor pain is intensely severe, often leading to hyperventilation and hormonal releases that can harm the fetus by reducing oxygen supply and causing metabolic acidosis. Effective pain management during childbirth is crucial for both physical and mental health. Various pharmacologic and non-pharmacologic methods are available, with epidural analgesia being a prominent choice. It is widely used in high-income countries, provides substantial pain relief, and benefits uterine contractions and placental perfusion. Epidural analgesia has potential side effects and controversies, such as delayed labor and higher intervention rates. ***Aim of the Study*:** The study aimed to examine the impact of epidural analgesia on the mode of delivery. ***Methods*:** This observational study, conducted from July 2021 to June 2022 at the Department of Gynecology and Obstetrics in a 250-bed District Hospital in Bagerhat, Bangladesh, included 50 participants divided into two groups of 25 each: Group A (with epidural analgesia) and Group B (without epidural analgesia). Approved by the Ethical Committee, the study included women aged 18-35 years, 37-41 weeks gestation, in labor with regular contractions, at least 4 cm cervical dilatation, and a regular fetal heart rate pattern. Excluded were women with medical or obstetrical complications, uterine scars, or spinal deformities. Data were collected via interviews, observations, and clinical examinations. ***Result*:** In this study of 50 participants (25 per group), most women were under 30 years old, with mean ages of 22.4±4.5 and 22.9±5.2 years in groups A and B, respectively. Gestational ages ranged from 37 to 40 weeks, and BMIs were 18.5-24.9 kg/m². Both groups had similar parity distributions. Normal vaginal births occurred in 84% (Group A) and 88% (Group B), with LSCS rates at 4%. Group A had 60% male neonates with average birth weights of 2.86±0.27 kg, and Group B had 56% males with weights of 2.88±0.26 kg. APGAR scores were high in both groups. ***Conclusion*:** Epidural labor analgesia is safe and does not increase instrumental deliveries or affect neonatal outcomes, making it a viable pain management option. Obstetric care providers can use this information to counsel women.

**Keywords:** Epidural analgesia, hyperventilation, and neonatal outcomes.



## INTRODUCTION

Parturients describe the pain of labor as the most intense pain they have ever experienced [1]. During childbirth, the body can be subjected to hyperventilation and the release of catecholamines and cortisol due to pain. This may lead to respiratory alkalosis and uterine vasoconstriction, which can decrease oxygen supply to the fetus and result in metabolic acidosis [2, 3]. Furthermore, experiencing severe pain during childbirth may lead to mental health issues for the mother, potentially impacting her relationship with her child or even her partner [4]. Therefore, alleviating labor pain is a primary concern for parturients and their families. Providing adequate and safe labor analgesia remains a challenge for both obstetricians and anesthesiologists. Effective pain relief during labor enhances the woman's satisfaction and contributes to a positive birth experience [5]. A variety of pharmacologic and non-pharmacologic methods have been employed to relieve labor pain, including transcutaneous electrical nerve stimulation (TENS), massage, acupuncture, water immersion, water

birth, yoga, music therapy, biofeedback, continuous labor support from midwives, positioning, ambulation, hypnosis, and aromatherapy [6]. Labor analgesia has evolved significantly from the use of ether and chloroform in 1847 to today's labor pain management guided by evidence-based medicine. Epidural analgesia offers effective pain relief during labor [7-9]. Epidural analgesia is widely used; a 2020 survey in 13 high-income countries found its utilization ranging from 10% to 83% of labor courses, depending on geography and parity. In the United States, 80% of first-time mothers now receive epidural analgesia during labor [10]. Epidural analgesia is regarded as the form of pain relief that has the most minor depressive effect. It reduces epinephrine levels, which enhances uterine contractions and improves placental perfusion [11, 12]. Epidural analgesia counteracts the adverse respiratory effects of pain and increases oxygen levels in both the mother and fetus. This can be particularly beneficial in cases where other factors may contribute to fetal or maternal hypoxia. Therefore, epidural analgesia is highly recommended for all patients without contraindications to this treatment method [13, 14]. Despite its benefits, the use of epidural analgesia is controversial due to potential drawbacks such as delayed labor progression, higher rates of operative interventions and instrumental deliveries, and possible adverse effects on the fetus and newborn. Additionally, epidural analgesia can cause side effects, including headache, back soreness, itching, backache, leg numbness, temporary urinary issues, and a drop in blood pressure. In rare cases, it may lead to permanent nerve damage. These considerations can influence the decision to use epidural analgesia for pain relief during labor [5]. Although there is no definitive consensus on the topic, further research is required to offer comprehensive and reliable information to laboring parturients, helping them make informed decisions about labor analgesia. This study aimed to examine epidural analgesia's impact on the delivery mode.

## METHODOLOGY & MATERIALS

This study was an observational investigation conducted over one year, from July 2021 to June 2022, and was carried out at the Department of Gynecology and Obstructs in 250 Bedded District Hospital, Bagerhat, Bangladesh. There were two groups. Each group consists of 25 participants. The Ethical Committee of the Institution approved the study protocol. The purpose and procedure of the study were explained to the chosen participants.

**Group A**: Patients with epidural analgesia.
**Group B**: Patients without epidural analgesia.

- **Inclusion Criteria**

Our study included participants who met the criteria, including maternal age (18-35 years), gestation week (37-41 weeks), women in labor diagnosed by regular uterine contractions and at least 4 cm cervical dilatation, regular fetal heart rate pattern (CTG) before starting epidural analgesia.

- **Exclusion Criteria**

Women with medical or obstetrical complications contracted pelvis/cephalopelvic disproportion, any uterine scar like previous LSCS, myomectomy, placenta previa, any foetal congenital anomaly, and anatomical deformity of the spine or any local infection were excluded from this study.

**Data Collection**

A structured data collection form was developed containing all the variables of interest. Data was collected through interviews, observations, and clinical examinations.

**Statistical Analysis**

All data were analyzed using the Statistical Package for the Social Sciences Software (SPSS), version 21.0. The mean ± standard deviation and the frequency and rate were measured for the quantitative and qualitative variables. The independent variable was epidural analgesia, the dependent variables were the mode of delivery and APGAR score, and the confounding variables were diabetes mellitus, obesity (BMI≥30 kg/m2), and inadequate uterine contraction.

## RESULT

In our study, two groups comprised 25 participants, making up 50 participants. Most women were aged below or equal to 30 years among groups A (88%) and B (84%). The mean age of groups A and B was 22.4±4.5 years and 22.9±5.2 years (Table 1). The majority of the participants had gestational age within 37 to 40 weeks in both Group A (88%) and Group B (92%) (Table 2). Figure 1 shows that 66% of patients were nullipara, and 34% were multipara, whereas, in group B, 60% were nullipara and 40% were multipara. Most participants had body mass indices (BMI) within the range of 18.5 to 24.9 kg/m², with similar results observed across both groups. The mean BMI was 24.8±2.5 kg/m² for Group A and 24.7±2.2 kg/m² for Group B (Table 3). 84% of participants in group A and 88% of participants in group B experienced a normal vaginal birth, while 4% of individuals in each group received LSCS. Group B had 8% instrumental delivery, and Group A had 12% (Table 4). In Group A, 60% of the neonates were male and 40% were female. The average birth weight was 2.86±0.27 kg. APGAR scores averaged 8.66±0.87 at one minute and 9.66±0.68 at five minutes. In Group B, 56% of the neonates were male, and 44% were female. The average birth weight was 2.88±0.26 kg. APGAR scores averaged 8.80±0.83 at one minute and 9.74±0.59 at five minutes (Table 5).

**Table 1: Age distribution of the study participants (n=50)**

| Age group (in years) | Group A | | Group B | |
|---|---|---|---|---|
| | n | % | n | % |
| ≤30 | 22 | 88 | 21 | 84 |
| >30 | 3 | 12 | 4 | 16 |
| Mean ± SD | 22.4±4.5 | | 22.9±5.2 | |
| Total | 25 | 100 | 25 | 100 |

**Table 2: Distribution of the study participants according to gestational age (n=50)**

| Gestational age (in weeks) | Group A | | Group B | |
|---|---|---|---|---|
| | n | % | n | % |
| 37-40 | 22 | 88 | 23 | 92 |
| >40 | 3 | 12 | 2 | 8 |
| Mean ± SD | 38.2±1.3 | | 38.1±1.3 | |

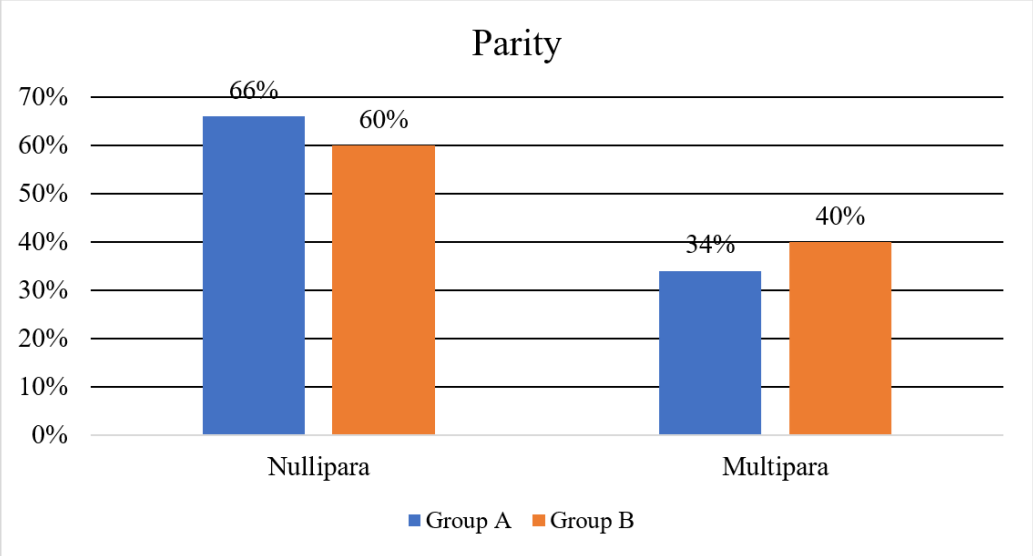


**Figure 1: Distribution of the study participants according to parity (n=50)**

**Table 3: Body mass index of the study participants (n=50)**

| BMI (kg/m2) | Group A | | Group B | |
|---|---|---|---|---|
| | n | % | n | % |
| 18.5-24.9 | 16 | 64 | 15 | 60 |
| 25-29.9 | 9 | 36 | 10 | 40 |
| Mean ± SD | 24.8±2.5 | | 24.7±2.2 | |

**Table 4: Mode of delivery of the study participants (n=50)**

| Mode of delivery | Group A | | Group B | |
|---|---|---|---|---|
| | n | % | n | % |
| NVD | 21 | 84 | 22 | 88 |
| Instrumental delivery | 3 | 12 | 2 | 8 |
| LSCS | 1 | 4 | 1 | 4 |

**Table 5: Neonatal outcome among both groups (n=50)**

| Birth history of neonates | Group A | | Group B | |
|---|---|---|---|---|
| | n | % | n | % |
| Male | 15 | 60 | 14 | 56 |
| Female | 10 | 40 | 11 | 44 |
| Weight (in kg) | 2.86±0.27 | | 2.88±0.26 | |
| APGAR score at 1 min | 8.66±0.87 | | 8.80±0.83 | |
| APGAR score at 5 min | 9.66±0.68 | | 9.74±0.59 | |

## DISCUSSION

The use of anesthesia during labor was once a subject of religious debate. However, in 1950, neuraxial techniques began to be used for managing labor pain [8]. Despite the development of various methods and medications to alleviate this discomfort, labor epidural analgesia (LEA) remains the most commonly used approach for managing pain during childbirth. Some research examining labor durations and outcomes in connection with epidural analgesia suggests that it may prolong labor times [16, 17]. This study, which involved 50 patients, aimed to determine the effect of epidural analgesia on delivery mode. In our study, the average age of women was 22.4±4.5 years in Group A and 22.9±5.2 years in Group B. Most women in both groups were 30 years old or younger. This aligns with the findings of a study by Deshmukh *et al.,* where the mean age of participants was 21.96±3.07 years in the study group and 21.90±3.20 years in the control group [15]. Another study conducted by Deepak *et al.,* also had patients with a mean age of 21.83±2.61 years and 21.54±4.06 years in the study and control, respectively [5]. The average gestational age of participants was 38.2±1.3 weeks in Group A and 38.1±1.2 weeks in Group B in this current investigation. Most participants were between 37 and 40 weeks of gestational age. According to the study by Deshmukh *et al.,* the mean gestational age was 38.46 weeks in the control group and 38.44 weeks in the study group [15]. Another similar study found a mean gestational age of 39.3 weeks and 39.4 weeks for the control and study groups, respectively [18]. Our study concluded that Group A comprised 66% nullipara and 34% multipara patients, while Group B included 60% nullipara and 40% multipara patients. Parity was nearly equivalent in both groups. Likewise, Papalkar *et al.,* found that most patients were primigravida in both Group A and Group B [13]. Conversely, Olszynska *et al.,* demonstrated that a higher number of patients were nullipara in the study group, while a higher number were multipara in the control group [18]. The individuals in the current study had mean BMIs of 24.7±2.2 kg/m2 in group B and 24.8±2.5 kg/m2 in group A. This outcome was in line with the earlier Deshmukh *et al.,* research, in which the study group's mean BMI was 21.98 and the control groups was 22.35 [15]. Within this current investigation, 21 patients (84%) in group A and 22 patients (88%) in group B experienced spontaneous vaginal deliveries; 3 patients (12%) in group A and two patients (8%) in group B experienced instrumental deliveries; and one patient (4%) in each group had a lower segment cesarean section (LSCS). The findings of Deshmukh *et al.,* study, which demonstrated that epidural anesthetic during labor did not raise instrumental delivery rates, were similar to ours [15]. Anwar *et al.,* did note, however, that patients using epidural analgesia had a higher risk of forceps delivery (54%) [8]. This observation could be connected to higher concentrations of local anesthetic agents in the past, which were administered in intermittent boluses and led to substantial motor blockade. This, in turn, may have reduced maternal mobility and effort during the second stage of labor. Additionally, relaxation of the pelvic floor muscles may have hindered adequate rotation of the fetal presenting part, potentially increasing the likelihood of instrumental deliveries. Out of 50 patients, only two had lower segment cesarean sections (LSCS), one from each group, during the second stage of labor. These LSCS procedures were performed due to failed instrumental deliveries and fetal malposition. In Deshmukh *et al.,* study, seven LSCS procedures were conducted, with four in the control group and three in the study group [15]. In the control group, three patients required (LSCS) due to a prolonged second stage of labor (DTA), while in the study group, only one patient experienced DTA and subsequently underwent LSCS [15]. Naito *et al.,* found that the use of (LEA) led to a higher rate of assisted vaginal deliveries, though it did not affect the rate of cesarean sections. The difference in cesarean section rates between the groups was 4.1% [19]. Despite obstetricians following guidelines that clearly outline when an assisted vaginal delivery or cesarean section should be carried out, there are variations in clinical practice among different providers. In this study, the APGAR scores at 1 minute and 5 minutes were 8.66±0.87 and 9.66±0.68, respectively, in Group A and 8.80±0.83 and 9.74±0.59 in Group B. In Deepak *et al.,* study, the 1-minute APGAR score was lower in the study group, but the APGAR scores at 5 minutes showed no significant difference between the two groups [5]. Anim-Somuah *et al.,* Cochrane study similarly revealed no changes in newborn outcomes across groups regarding Apgar score at five minutes [8].

***Limitations of the Study:***

A randomized, controlled trial would be the ideal approach to examine the impact of epidural analgesia on delivery methods and perinatal outcomes. However, with the growing popularity of epidurals, it is becoming increasingly challenging to recruit participants willing to be randomly assigned to receive epidurals or alternative forms of analgesia. Another limitation of such studies is often the relatively small sample size, which may only partially represent the broader population. The study and follow-up period were short in comparison to other studies.

## CONCLUSION AND RECOMMENDATIONS

Based on the results of this study, there was no significant rise in the occurrence of instrumental or operative deliveries, and neonatal outcomes were unaffected. Consequently, it can be concluded that epidural labor analgesia is a viable and safe means of pain management during labor, particularly in settings where it is accessible. This information is valuable for obstetric care providers as it can aid them in offering informed counseling to women considering the use of epidural analgesia. The lack of definitive guidelines, influenced by factors like expertise, cost, and availability, means that few public health facilities in Bangladesh offer labor analgesia programs. Larger-scale

studies are needed to establish clear guidelines regarding the use of epidural analgesia during labor.

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**Conflict of Interest:** None declared.

## REFERENCES


1. Beigi, N. M., Broumandfar, K., Bahadoran, P., & Abedi, H. A. (2010). Women's experience of pain during childbirth. *Iranian journal of nursing and midwifery research*, *15*(2), 77.
2. Reynolds, F. (2011). Labour analgesia and the baby: good news is no news. *International journal of obstetric anesthesia*, *20*(1), 38-50.
3. Labor, S., & Maguire, S. (2008). The pain of labour. *Reviews in pain*, *2*(2), 15-9.
4. Wong, C. A. (2010). Advances in labor analgesia. *International journal of women's health*, *9*, 139-54.
5. Deepak, D., Kumari, A., Mohanty, R., Prakash, J., Kumar, T., & Priye, S. (2022). Effects of epidural analgesia on labor pain and course of labor in primigravid parturients: a prospective non-randomized comparative study. *Cureus*, *14*(6).
6. Silva, M., & Halpern, S. H. (2010). Epidural analgesia for labor: Current techniques. *Local and regional anesthesia*, *8*, 143-53.
7. Leighton, B. L., & Halpern, S. H. (2002). The effects of epidural analgesia on labor, maternal, and neonatal outcomes: a systematic review. *American journal of obstetrics and gynecology*, *186*(5), S69-77.
8. Anim-Somuah, M., Smyth, R. M., Cyna, A. M., & Cuthbert, A. (2018). Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane database of systematic reviews*, *5*.
9. Gizzo, S., Noventa, M., Fagherazzi, S., Lamparelli, L., Ancona, E., Di Gangi, S., Saccardi, C., D'Antona, D., & Nardelli, G. B. (2014). Update on best available options in obstetrics anaesthesia: perinatal outcomes, side effects and maternal satisfaction. Fifteen years systematic literature review. *Archives of gynecology and obstetrics*, *290*, 21-34.
10. Seijmonsbergen-Schermers, A. E., Van Den Akker, T., Rydahl, E., Beeckman, K., Bogaerts, A., Binfa, L., ... & De Jonge, A. (2020). Variations in use of childbirth interventions in 13 high-income countries: a multinational cross-sectional study. *PLoS medicine*, *17*(5), e1003103.
11. Munro, A., George, R. B., & Allen, V. M. (2018). The impact of analgesic intervention during the second stage of labour: a retrospective cohort study. *Canadian Journal of Anesthesia*, *65*(11), 1240-1247.
12. Lee, L., Dy, J., & Azzam, H. (2016). Management of spontaneous labour at term in healthy women. *Journal of Obstetrics and Gynaecology Canada*, *38*(9), 843-65.
13. Papalkar, J., Shrivastava, D., & Hariharan, C. (2013). Epidural Analgesia in Labour. *Int J Biol Med Res*, *4*(1), 2707-12.
14. Paddalwar, S., Nagrale, M., Chandak, A., Shrivastava, D., & Papalkar, J. (2013). A randomized, double-blind, controlled study comparing Bupivacaine 0.125% and Ropivacaine 0.125%, both with Fentanyl 2 µg/ml, for labor epidural analgesia. *Indian Journal of Pain*, *27*(3), 147-53.
15. Deshmukh, V. L., Ghosh, S. S., Yelikar, K. A., & Gadappa, S. N. (2018). Effects of epidural labour analgesia in mother and foetus. *The Journal of Obstetrics and Gynecology of India*, *68*, 111-6.
16. Indraccolo, U., Ripanelli, A., Di Iorio, R., & Indraccolo, S. R. (2012). Effect of epidural analgesia on labor times and mode of delivery: a prospective study. *Clinical and experimental obstetrics & gynecology*, *39*(3), 310-3.
17. Cheng, Y. W., Hopkins, L. M., & Caughey, A. B. (2004). How long is too long: does a prolonged second stage of labor in nulliparous women affect maternal and neonatal outcomes?. *American journal of obstetrics and gynecology*, *191*(3), 933-8.
18. Olszynska, A., Di Martino, Z., Pawlowska, A., Feduniw, S., Modzelewski, J., Kajdy, A., ... & Rabijewski, M. (2023). Epidural analgesia: effect on labor duration and delivery mode—a single-center cohort study. *Ginekologia Polska*, *94*(9), 733-740.
19. Naito, Y., Ida, M., Yamamoto, R., Tachibana, K., & Kinouchi, K. (2019). The effect of labor epidural analgesia on labor, delivery, and neonatal outcomes: a propensity score-matched analysis in a single Japanese institute. *JA clinical reports*, *5*, 1-7.