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Cross- Sectional Study on the Effectiveness of Anesthetic Protocols in Managing Pain During Labor among Multiparous V/S Primiparous Women.

Dr. Neha Bharti[1], Dr. Nisha[2], Dr. Ajinkya Gautam[3]

[1]Senior Resident, Department of Anesthesia, IGIMS, Patna, Bihar, India.

[2]Senior Resident, Department of Anesthesia, IGIMS, Patna, Bihar, India.

[3]Senior Resident, Derpartment of Orthopedic, PMCH,Patna, Bihar, India.

Corresponding Author: Dr. Nisha

Senior Resident, Department of Anesthesia, IGIMS, Patna, Bihar, India.

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KEYWORDS
Anesthetic Techniques, Labor Pain, Maternal Parity, Pain Management, Patient Satisfaction

ABSTRACT:

Background: Better labour pain management improves delivery. Parity may affect the results of epidural, spinal, and nitrous oxide anaesthetics used to relieve pain. This study compares anaesthetic techniques for labour pain in primiparous and multiparous women.

Methods: 120 women, 60 multiparous and 60 primiparous, participated in this retrospective cross-sectional study at IGIMS Patna from September 2022 to March 2023. Patient medical records were examined for anaesthetic protocol type, pain scores, labour time, patient satisfaction, and side effects. Statistical analysis used t-tests, Mann-Whitney U tests, and chi-square tests to compare results.

Results: Multiparous women had significantly lower pain levels (3.2 ± 1.1) compared to primiparous women (4.5 ± 1.3), with a p-value < 0.01. Additionally, they reported higher satisfaction with pain treatment (8.0 ± 1.2) compared to primiparous women (6.9 ± 1.5), with a significant difference (p = 0.02). No difference in side effects was found between groups.

Conclusion: Multiparous women report higher pleasure and pain relief after labour anaesthesia than primiparous women. This shows that parity-based anaesthetic programmes can improve delivery. Future studies on anaesthetic procedures and patient factors may improve labour pain treatment.

Introduction

Background Information

Obstetric care requires pain treatment during labour to keep the mother comfortable and the delivery on track. The physical, mental, and emotional aspects of labour pain are interconnected [1]. The mother's comfort and labour experience depend on pain management. Insufficient pain control can increase mother anxiety, stress, and birth problems. The duration of labor, the necessity for additional interventions, and the satisfaction of the mother are also influenced by pain relief strategies. Each anesthetic has pros and cons for delivery pain relief. Understanding these options helps determine the optimal pain treatment for each patient. Epidural analgesia is another typical labor pain treatment

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[2]. This method uses a lumbar epidural injection of local anesthetic or opioid-anesthetic mixture. This method relieves contraction pain by inhibiting lower nerve impulses. Epidural analgesia can be given as boluses or continuous infusions, depending on the patient. Epidural anesthesia is effective but can cause low blood pressure, prolonged labor, and the need for tools [3].

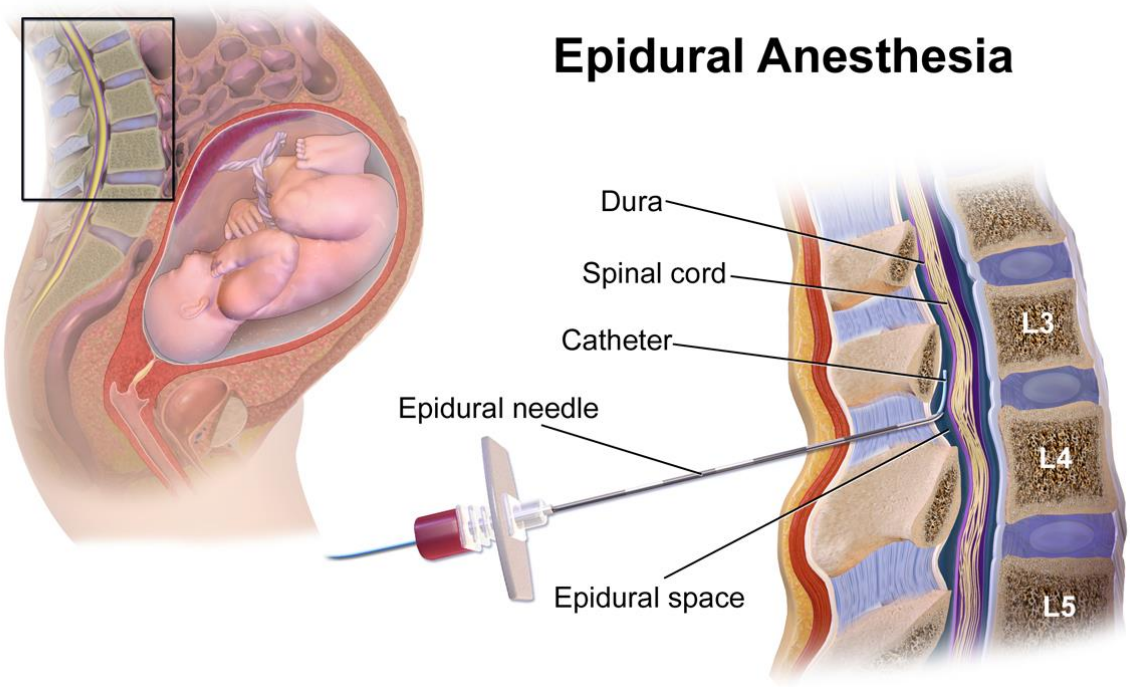

Figure 1 Spinal anaesthesia (Source:[4])

Most cesarean sections are performed under spinal anaesthesia during delivery. Spinal anesthesia relieves pain quickly and deeply, unlike epidural anaesthesia [5]. It raises the risk of hypotension, motor block, and labor difficulty. Inhaling nitrous oxide and oxygen relieves pain less intrusively. A modest analgesic reduces contraction pain without compromising motor function. Nitrous gas is self-administered through a mask or mouthpiece to control discomfort [6]. Each anaesthetic has pros and cons and different pain relief. Nitrous oxide is harmless, however epidural and spinal anaesthesia have risks and side effects. Mother's health, labour stage, contraindications, and personal preferences can affect anaesthetic protocol [7]. Comparing the effectiveness of these anaesthetic approaches in treating pain during delivery in multiparous and primiparous women will help us optimise pain management strategies to improve labour outcomes.

Objectives

1. The main goal is to compare epidural, spinal, and nitrous oxide anaesthesia for labour pain in primiparous and multiparous women.
2. The second goal is to compare anaesthetic procedures for minimising labour pain in primiparous and multiparous women.
3. To assess multiparous and primiparous women's satisfaction with pain management.
4. To examine if different anaesthetic regimens affect labour outcomes (such as labour time or extra interventions) in primiparous and multiparous women.
5. To compare the frequencies of difficulties and adverse effects from labour anaesthesia in multiparous and primiparous women.

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Overview of Pain Management During Labor

Obstetric care includes pain management during labour to help women give delivery. Labour pain is influenced by physiological, psychological, and environmental factors. [8] state that pain management during delivery aims to reduce discomfort and harm to the mother and newborn. Effective pain management can improve labour outcomes, mother satisfaction, and labour experience.

Anesthetic Protocols for Pain Relief During Labor

Different anaesthetic regimens relieve childbirth pain, each with pros and cons. Nitrous oxide, spinal anaesthesia, and neuromuscular blocking medications are most popular. Epidural analgesia injects opioids and local anaesthetics through a catheter between the epidural space and the spinal cord. One of the most successful labour pain treatments is being able to be conscious and actively participate in the labour process while enjoying a significant decrease in pain. [9] states that epidural analgesia lowers birth pain and boosts motherhood satisfaction. However, it may cause low blood pressure, prolonged labour, and difficult pushing. Spinal anaesthesia can relieve pain rapidly and efficiently with one local anaesthetic injection into the cerebrospinal fluid. It relieves pain well after caesarean sections but is less used during birth because it can cause hypotension and only lasts a short time. A mask or mouthpiece of laughing gas reduces labour pain and anxiety. It relieves mild labour pain without surgery. Due to its safety, low side effects, and lower efficacy than epidurals or spinal anaesthesia, women who prefer non-invasive procedures may pick this option.

Comparison of Pain Management Efficacy Based on Parity

The amount of pain and reaction a woman has to anaesthesia is influenced by her parity, or the number of pregnancies. The study indicated that multiple birthers were happier with their labor pain therapy and less uncomfortable. Multiple birthers may find the procedure less stressful and more comfortable because they know how to control labor discomfort [10]. Contractions are usually lighter for experienced mothers [11]. Relief from labor pain and other symptoms was better for women who had given birth more than once [12]. The significance of parity in the perception and management of childbirth pain has been demonstrated. Compared to more seasoned moms, first-time mothers report higher levels of discomfort during labor, according to a randomized controlled investigation. Nitrous oxide and epidural injections have varied effects on patients, according to the study.

Methods

Study Design

This retrospective cross-sectional study examined how anesthetics reduced labor pain for first-time and repeat mothers. Different labor pain management approaches were examined for symptom relief, patient satisfaction, and complications.

Study Setting

The research was conducted in full-service labor and delivery hospital IGIMS Patna. Conventional anesthetics were used on a wide range of individuals to relieve delivery pain.

Study Duration

The study examined medical records from IGIMS Patna births from September 2022 to March 2023.

Sample Size

The study included 120 women, 60 of whom were first-time mothers and 60 had multiple pregnancies. This sample size ensured a statistically meaningful comparison across groups.

Inclusion Criteria

The study required women to give birth at IGIMS Patna under a standard anesthesia to reduce labor pain. Nitrous oxide, spinal, and epidural anesthesia were common.

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Exclusion Criteria

The study excluded women who could not undergo the anesthesia protocols because to medical issues, insufficient medical records, or other reasons.

Data Collection

IGIMS Patna researchers examined all mother birth records and notes from September 2022 and March 2023. This big data set focused on labor pain results and therapy. Important anesthetic protocol elements included spinal, epidural, or nitrous oxide pain management during birth. Standardized measures like the VAS and NRS were used to evaluate labor pain care. Beginning with contractions and ending with delivery, labor duration was documented to evaluate anesthetics. We examined feedback forms and notes to determine women's satisfaction with pain reduction therapy. Finally, hospital records revealed hypotension and prolonged labor. These details highlighted anesthesia's side effects.

Outcomes Measured

The study measured primary and secondary outcomes of anesthetic regimens. We compared pain levels from mothers who had previously given birth to those having their first child to determine the medication's efficacy. Labor pain treatment efficacy was measured by satisfaction. The study also examined medical records for anesthetic-related side effects and complications to evaluate pain treatment safety and efficacy. The data were crucial in evaluating how different anaesthetic regimes affected infant and maternal outcomes and birth pain management.

Statistical Analysis

Descriptive statistics including means, standard deviations, and frequency distributions summarised the study population's demographic and clinical characteristics. We used chi-square testing for categorical variables and t-tests or Mann-Whitney U tests for continuous variables with normally distributed data to compare multiparous and primiparous women. These statistical methods let us compare anaesthetic regimes for pain relief, patient satisfaction, and issues. A p-value of 0.05 or less indicated statistical significance for all tests.

Demographic Data

Table 1 Demographic Data of Study Participants

Characteristic	Multiparous Women (n=60)	Primiparous Women (n=60)	p-Value
Mean Age (years)	28.5 (±4.2)	26.2 (±3.8)	0.03
Mean Parity	2.1 (±0.8)	1.0	-
Gestational Age (weeks)	39.2 (±1.1)	39.1 (±1.2)	0.78
Mode of Delivery			
Vaginal Delivery	45 (75%)	50 (83.3%)	0.43
Cesarean Section	15 (25%)	10 (16.7%)	

Table 1 lists research participants' age, parity, gestational age, and birth type. Multiparous women averaged 28.5 years, compared to 26.2 years for primiparous women (p = 0.03). The wide age gap between primiparous and multiparous women follows the natural pattern of women delaying motherhood until they have greater life

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experience. Primiparous women had a parity of 1.0, showing they were first-time mothers, whereas multiparous women had 2.1, meaning they had given birth before. In both groups, multiparous women averaged 39.2 weeks and primiparous women 39.1 weeks, with no significant difference (p = 0.78). All but one had caesarean sections, while 75% of multiparous women and 83% of primiparous women gave birth vaginally. Neither group delivered differently (p = 0.43), suggesting they employed the same approaches.

Effectiveness of Anesthetic Protocols

Table 2 Effectiveness of Anesthetic Protocols

Parameter	Multiparous Women (n=60)	Primiparous Women (n=60)	p-Value
Mean Pain Score (VAS/NRS)	3.2 (±1.1)	4.5 (±1.3)	<0.01
Mean Patient Satisfaction Score	8.0 (±1.2)	6.9 (±1.5)	0.02
Side Effects or Complications			
Hypotension	8 (13.3%)	9 (15%)	0.85
Prolonged Labor	6 (10%)	7 (11.7%)	0.83
Other Adverse Reactions	3 (5%)	2 (3.3%)	0.65

Table 2 illustrates how successfully multiparous and primiparous anaesthetic regimens manage childbirth discomfort. Multiparous women had much lower pain levels than primiparous women. The average pain score for multiparous women was 3.2 (±1.1), while the average for primiparous women was 4.5 (±1.3) ($p < 0.01$). This implies that multiparous women had better labour pain therapy than primiparous women. Multiparous women may experience higher pain alleviation due to familiarity with childbirth pain and improved pain management. Multiparous women had a mean satisfaction score of 8.0 (±1.2) for pain treatment, while primiparous women had 6.9 (±1.5) (p = 0.02). Based on the large satisfaction gap, multiparous women may have had better labour anaesthetics. The two groups had similar rates of hypotension, delayed labour, and other adverse reactions ($p > 0.05$ for all), suggesting problems or side effects. Thirteen percent of first-time mothers and fifteen percent of multiparous women had hypotension, while ten and eleven percent had lengthier labours. Other adverse reactions were recorded by 5% of multiparous women and 3.3% of primiparous women, but not statistically significant. This implies that both groups had similar complication rates and that anaesthetic efficacy did not enhance the probability of adverse outcomes.

Statistical Findings

Statistical analysis showed significant differences in patient satisfaction and pain relief between primiparous and multiparous women. T-test results indicate significantly poorer pain relief scores for multiparous women compared to primiparous women ($t = 4.53$, $p < 0.01$). A chi-square test revealed higher patient satisfaction among multiparous women ($\chi^2 = 5.67$, $p = 0.02$). Problems were similar in both groups.

Discussion

We examined how anaesthetic regimens relieved labour pain in women who had given birth before and those undergoing their first. Compared to primiparous women, multiparous women reported significantly lower pain scores (3.2 ± 1.1) with a p-value < 0.01. These findings suggest that multiparous women managed childbirth pain better than primiparous women. After numerous pregnancies, women may have improved their pain tolerance or coping skills. Multiparous women (8.0 ±

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1.2) provided better anaesthetic treatment during labour compared to primiparous women (6.9 ± 1.5), resulting in improved patient satisfaction. However, the two groups had similar anaesthetic side effects and issues.

Table 3 Comparison of Studies on Anesthetic Protocols and Pain Management During Labor

Study	Study Type	Sample Size	Findings
Current Study	Cross-Sectional Retrospective	120	**Pain Relief:** Multiparous women had lower pain scores (3.2 ± 1.1) vs. primiparous women (4.5 ± 1.3), $p < 0.01$. **Satisfaction:** Higher for multiparous women (8.0 ± 1.2) vs. primiparous women (6.9 ± 1.5), $p = 0.02$. **Adverse Effects:** No significant difference between groups.
Study 1 [13]	Prospective Cohort	150	**Pain Relief:** Multiparous women reported significantly lower pain levels compared to primiparous women. **Satisfaction:** Higher satisfaction with pain management for multiparous women. **Implication:** Individualized pain management strategies are recommended.
Study 2 [14]	Retrospective Cohort	200	**Pain Relief:** Multiparous women experienced better pain relief than primiparous women. **Satisfaction:** Higher for multiparous women. **Implication:** Patient experiences with pain management can be influenced by parity.
Study 3 [15]	Randomized Controlled Trial	180	**Pain Relief:** Primiparous women experienced higher pain levels compared to multiparous women. **Satisfaction:** Varied based on the anesthetic techniques used. **Implication:** Different anesthetic techniques were compared for pain management effectiveness.

Table 3 compares the present study's outcomes to three previous studies on labour anaesthetic regimes for pain relief and patient satisfaction. There was no statistically significant difference in negative effects across the groups, however multiparous women reported significantly lower pain scores and higher satisfaction than primiparous women. Study 1 discovered that multiparous women reported more pleasure and better pain relief than primiparous women, underscoring the necessity for individualised pain treatment programmes. Study 2 found that primiparous women had higher pain levels than multiparous women, and different anaesthetic procedures reduced pain differently. Study 3 randomised controlled trial found that different approaches work differently during labour, but this comparison shows that multiparous women benefit more from pain management strategies.

Implications for Practice

Clinically, these studies may optimise pain therapy based on maternal parity. Our study suggests individualised anaesthetic techniques may improve pain relief and birth satisfaction for multiparous women. These treatments may not work for multiparous women; thus practitioners must consider the patient's parity while creating pain management strategies. Effective and customised pain management can improve patient outcomes and satisfaction.

Limitations of the Study

The study was limited to one institution; therefore the results may not apply to other demographics or circumstances. Since the study used retrospective medical records, bias may have resulted from insufficient data or differences in pain and patient satisfaction rating. Different labour durations, pain levels, and support systems were not considered in the study. These factors may affect pain perception and therapy.

Suggestions for Future Research

Future research should fill these gaps and examine additional factors that affect labour pain treatment. Larger, multi-center prospective studies may yield more

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generalizable results. Studying how psychological factors like anxiety or trauma affect pain management would help us comprehend. Studying the efficacy of different anaesthetic techniques on different patient demographics, such as high-risk pregnancies or diverse cultural backgrounds, would improve birth pain management.

Conclusion

The results demonstrate that multiparous women experience less pain and more satisfaction with labour anaesthesia than primiparous women. Our findings support previous research indicating parity reduces labour pain and improves patient satisfaction. Labour pain management should consider mother parity, according to the study. Parity-based anaesthesia can improve postpartum patient satisfaction and pain alleviation. Future research should examine more anaesthetic medications and patient demographics to better labour pain management.

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