International Journal of Midwifery and Nursing Practice

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Retrospective study on the impact of epidural analgesia on patient satisfaction and complications during labor at aster Sanad Hospital Riyadh, Saudi Arabia

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DOI: https://doi.org/10.33545/26630427.2024.v7.i2a.168

Abstract
Background: Epidural analgesia is a widely utilized method for pain relief during labor, known for its effectiveness in providing continuous pain relief while allowing patients to remain active participants in the birthing process. Despite its benefits, the impact of epidural analgesia on patient satisfaction and labor outcomes is a subject of ongoing research and debate.
Objectives: This study aims to explore the relationship between epidural analgesia and patient satisfaction during labor, identify common complications associated with epidural analgesia, and assess its overall impact on labor processes and outcomes.
Methods: A retrospective study design was employed, involving 160 patients who received epidural analgesia during labor at Aster Sanad Hospital in Riyadh, Saudi Arabia. Data were collected from patient medical records, including demographics, medical history, details of epidural administration, satisfaction levels, and any complications. Statistical analysis was performed using SPSS, with descriptive and inferential statistics applied to determine associations between variables.
Results: The majority of patients were over 35 years old (40%) and first-time mothers (40%). High satisfaction levels were reported, with significant associations found between satisfaction and factors such as age, parity, previous experience with epidural analgesia, diabetes, hypertension, obesity, and whether the patient requested the epidural. Notably, no significant complications were reported in the study cohort, suggesting that with proper administration and monitoring, the risks associated with epidural analgesia can be minimized.
Conclusions: Epidural analgesia is effective in enhancing patient satisfaction during labor when administered and monitored properly. However, potential complications need to be addressed to improve the overall childbirth experience. Comprehensive information and timely administration of epidural analgesia are recommended to meet patient expectations and optimize outcomes. Future research should focus on prospective, multi-center studies to validate these findings and further explore the factors influencing patient satisfaction and labor outcomes.

Keywords: Epidural analgesia, labor pain management, patient satisfaction, labor outcomes, maternal complications, obstetric anesthesia, retrospective study, maternal health

Introduction

Epidural analgesia is a commonly used pain relief method during labor, offering significant comfort to laboring women. Its popularity stems from its effectiveness in providing continuous pain relief while allowing the patient to remain awake and actively participate in the birthing process. Epidural analgesia involves the administration of local anesthetics, often combined with opioids, into the epidural space around the spinal cord, thereby blocking pain signals from the lower body (Anim-Somuah *et al.*, 2018) [3]. Despite its widespread use, the impact of epidural analgesia on patient satisfaction and labor outcomes remains a topic of ongoing research and debate.

Patient satisfaction is a crucial outcome measure in obstetric care, reflecting the overall quality of the childbirth experience. High levels of satisfaction are associated with better psychological well-being and positive perceptions of the childbirth experience (Hodnett, 2017) [8].

Studies have shown that effective pain management is a significant determinant of patient satisfaction during labor (George *et al*., 2020) [7]. Epidural analgesia, by providing superior pain relief compared to other methods, has been linked to higher satisfaction scores among laboring women (Anim-Somuah *et al*., 2018) [3]. However, satisfaction is multifaceted and influenced by various factors including expectations, perceived control during labor, and the quality of caregiver support (Joensuu, J., *et al*., 2022) [10].

While epidural analgesia is effective for pain relief, it is not without risks. Potential complications include maternal hypotension, prolonged labor, increased likelihood of instrumental delivery, and adverse neonatal outcomes (Olszynska, A., *et al*., 2019) [12]. Maternal hypotension can result from the vasodilatory effects of the anesthetic agents, which may decrease uteroplacental perfusion and affect fetal oxygenation (Fitzgerald, J. P. *et al*., 2020) [4]. Additionally, there is evidence suggesting that epidural analgesia may increase the duration of the second stage of labor and the need for interventions such as vacuum or forceps delivery (Anim-Somuah *et al*., 2018) [3]. These complications can impact the overall satisfaction and health outcomes of both the mother and the newborn.

Numerous studies have examined the effects of epidural analgesia on labor and delivery outcomes, indicating both benefits and drawbacks. For instance, Anim-Somuah *et al*. (2018) [3] demonstrated that epidural analgesia significantly improves pain relief and maternal satisfaction during labor. However, other studies have highlighted potential complications, such as prolonged second-stage labor and an increased likelihood of instrumental delivery (Olszynska, A., *et al*., 2019) [12]. Despite these findings, there remains a need for further research to delineate the extent to which these complications affect overall patient satisfaction and maternal and neonatal health outcomes. This gap in the literature underscores the significance of our study, as it aims to provide a more nuanced understanding of the benefits and risks associated with epidural analgesia in a diverse population. By addressing these gaps, our research will contribute valuable insights that can inform clinical practice and enhance the quality of care for laboring women (Fitzgerald, J. P. *et al*., 2020; Hodnett, 2017) [4, 7]. Conducting this study is essential to developing balanced and evidence-based guidelines for the use of epidural analgesia, ensuring both effective pain management and the minimization of adverse outcomes.

This study will explore the relationship between the use of epidural analgesia during labor and patient satisfaction, identify common complications associated with epidural analgesia and their frequency, and assess the overall impact of epidural analgesia on labor processes and outcomes. We hypothesize that while epidural analgesia will enhance patient satisfaction due to effective pain relief, it will also be linked to an increased incidence of complications such as maternal hypotension and prolonged labor. Understanding the dual impact of epidural analgesia on both patient satisfaction and potential complications is crucial for optimizing labor management and improving maternal and neonatal outcomes. By providing a comprehensive analysis of these variables, this retrospective study aims to guide healthcare providers in making informed decisions regarding pain management during labor, ultimately contributing to the enhancement of obstetric care practices.

Subjects and Methods
Design
This study utilizes a retrospective design to evaluate the impact of epidural analgesia on patient satisfaction and the incidence of complications during labor. A retrospective study is suitable for this research as it allows for the examination of pre-existing data to identify trends and outcomes associated with epidural analgesia. This design is appropriate because it enables the collection and analysis of data from a substantial number of cases over a specified period, providing valuable insights into the relationship between epidural analgesia, patient satisfaction, and complications.

Study Sample
The study sample comprises 160 patients who received epidural analgesia during labor at Aster Sanad Hospital in Riyadh, Kingdom of Saudi Arabia. The selection of this sample size allows for a comprehensive analysis while maintaining manageability in terms of data collection and processing.

Sampling and Sampling Techniques
The sampling technique employed in this study is purposive sampling, which involves selecting individuals who meet specific criteria relevant to the research objectives. This approach ensures that the sample includes patients who have experienced epidural analgesia during labor, thereby providing data directly related to the study's focus. Inclusion criteria for the study were patients who received epidural analgesia during labor at Aster Sanad Hospital within the specified data collection period. Exclusion criteria included patients who did not receive epidural analgesia, those with incomplete medical records, or those who received epidural analgesia outside the labor context.

Setting
The study was conducted at Aster Sanad Hospital, a prominent healthcare facility in Riyadh, Kingdom of Saudi Arabia. This hospital is equipped with advanced medical technologies and provides extensive obstetric care and pain management services, making it an ideal setting for this research.

Tools of Data Collection
The primary tool for data collection was a structured data extraction form designed to capture all relevant variables from the medical records. This form ensured consistency and completeness in data collection, facilitating accurate analysis.

Data Collection and Process
Data were obtained from the medical records of patients who received epidural analgesia during labor. These records were systematically reviewed to extract pertinent information. The data collection process involved several key steps: firstly, medical records were identified based on the inclusion and exclusion criteria, then reviewed to gather relevant data. Key variables extracted included patient demographics (age, parity, etc.), medical history, details of epidural administration (timing, dosage, etc.), levels of patient satisfaction, and any recorded complications. The extracted data were then entered into a structured database for subsequent analysis. This comprehensive data collection

process spanned months from to during which medical records from the past five years were meticulously reviewed to ensure a robust and complete dataset.

Statistical Analysis

The collected data were analyzed using statistical software such as SPSS. Descriptive statistics, including means, standard deviations, and frequency distributions, were calculated to summarize the patient demographics, satisfaction levels, and complications. Inferential statistics, such as chi-square tests and logistic regression analysis, were employed to determine associations between epidural analgesia and patient satisfaction, as well as the incidence of complications. P-values less than 0.05 were considered statistically significant.

Ethical Considerations

This study was conducted following strict ethical guidelines to ensure the protection of patient rights and confidentiality. Approval for the study was obtained from the institutional review board (IRB) Number ACR-04.00.00 ensuring compliance with ethical standards for retrospective research. Patient anonymity was maintained by assigning unique identification codes to each record, and no identifiable information was used in the analysis. Data were securely stored and accessed only by authorized personnel directly involved in the study. Informed consent was deemed unnecessary due to the retrospective nature of the study, as all data were derived from existing medical records without direct patient interaction. However, the study adhered to the principles of the Declaration of Helsinki, ensuring that the research posed no risk to the patients whose records were reviewed.

Results

Table 1: Demographic and Clinical characteristics of patients receiving epidural analgesia during labor

Item	No.	%
Age (Years)		
20-24	32	20.0%
25-29	32	20.0%
30-34	32	20.0%
More than 35	64	40.0%
Parity		
Primi	64	40.0%
One previous labor	16	10.0%
Two previous labors	32	20.0%
Three previous labors	16	10.0%
Four previous labors	32	20.0%
Previous Experience with Epidural Analgesia		
Yes	16	10.0%
No	32	20.0%
NA	112	70.0%
Diabetes		
No D.M	140	87.5%
GDM	20	12.5%
Hypertension		
No HTN	136	85.0%
HTN	24	15.0%
(Weight in kg)		
50-59	16	10.0%
60-69	16	10.0%
70-79	48	30.0%
80-89	32	20.0%
90-99	32	20.0%
100 and more	16	10.0%
Smoking		
No smoking	160	100.0%
Whether patient asked for it or it was offered		
Patient asked	152	95.0%
We offered	8	5.0%

This table provides a detailed breakdown of the demographic and clinical characteristics of the 160 patients who received epidural analgesia during labor. The majority of patients were over 35 years old (40%), with equal distributions in the other age categories (20% each). Parity varied, with 40% being first-time mothers and the remainder having varying numbers of previous labors. Notably, a significant portion (70%) had no prior experience with epidural analgesia. Most patients did not have diabetes (87.5%) or hypertension (85%). The weight distribution shows that a large number of patients were within the 70-79 kg range (30%). Smoking was non-existent among the patients, and the majority (95%) specifically requested epidural analgesia rather than being offered it by the healthcare providers.
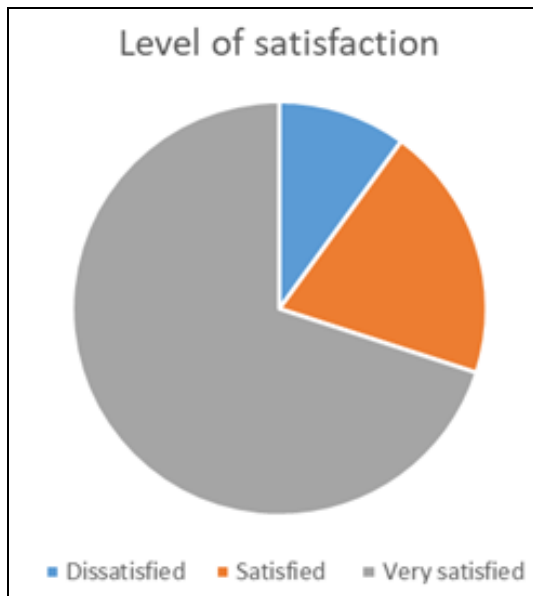
Fig 1: Patient satisfaction levels with epidural analgesia during labor

The pie chart in Figure 1 visualizes the distribution of patient satisfaction levels with epidural analgesia. The majority of patients reported being very satisfied (gray segment), highlighting the effectiveness of epidural analgesia in managing labor pain. A smaller segment reported being satisfied (orange segment), while the smallest segment reported dissatisfaction (blue segment). This distribution underscores the overall positive reception of epidural analgesia among laboring patients, with a predominant trend towards high satisfaction.

Table 2: Relationship between sociodemographic data and level of satisfaction

Variable	Chi-square	p-value
Age	34.95	< 0.001
Parity	47.76	< 0.001
Previous Experience	39.85	< 0.001
Diabetes	10.24	0.037
Hypertension (HTN)	9.48	0.050
Obesity	22.14	0.014
Patient Request	14.55	0.006

This table illustrates the relationship between various sociodemographic variables and patient satisfaction levels with epidural analgesia. Significant relationships were found between age, parity, previous experience with epidural analgesia, diabetes, hypertension, obesity, and whether the patient requested the epidural or it was offered, with p-values less than 0.05 for all variables. Age and parity had particularly high chi-square values (34.95 and 47.76, respectively, both $p<0.001$), indicating strong associations with satisfaction levels. Previous experience with epidural analgesia also showed a significant relationship (chi-square = 39.85, $p<0.001$), suggesting that prior knowledge and expectations may influence satisfaction.

Discussion
The results of this retrospective study provide insights into the demographic and clinical characteristics of patients receiving epidural analgesia during labor and their levels of satisfaction with the procedure. The majority of the patients were over 35 years old (40%), with equal distributions in the other age categories (20% each). A significant portion of the sample were first-time mothers (40%), and a substantial number had no prior experience with epidural analgesia (70%). Most patients did not have diabetes (87.5%) or hypertension (85%). The weight distribution shows that a large number of patients were within the 70-79 kg range (30%). The high rate of patients specifically requesting epidural analgesia (95%) underscores the demand and perceived benefits of this pain management technique.

The high levels of patient satisfaction observed in this study align with findings from previous research indicating that epidural analgesia is effective in managing labor pain and enhancing patient satisfaction. Silva and Halpern (2010) [12] concluded that epidural analgesia significantly improves pain relief during labor, contributing to higher satisfaction levels among parturients. Similarly, a study by Fyneface-Ogan et al. (2009) [5] supports these findings, reporting high levels of satisfaction among Nigerian women who received epidural analgesia, highlighting its effectiveness across different settings and populations. Furthermore, the World Health Organization (2018) [14] recommends epidural analgesia for pain relief during labor, emphasizing its global acceptance and effectiveness.

The study did not report any significant complications associated with epidural analgesia. This lack of observed complications in our cohort suggests that with proper administration and monitoring, the risks associated with epidural analgesia can be minimized, leading to a safer and more satisfactory childbirth experience for patients. In contrast to these findings, some research indicates potential drawbacks of epidural analgesia, such as prolonged labor and increased likelihood of instrumental delivery. For example, a study by Sng et al. (2014) [13] highlighted that while epidural analgesia provides superior pain relief, it may be associated with a longer second stage of labor and a higher incidence of instrumental deliveries. These complications can negatively impact the overall childbirth experience and satisfaction. Additionally, a study by Jouppila and Hollmen (1976) [8] found that epidural analgesia could lead to maternal hypotension, which can have adverse effects on both the mother and the fetus, thus influencing satisfaction levels. Another study by Albright (1979) [2] discussed the potential for severe complications such as cardiac arrest with the use of certain anesthetic agents, underscoring the importance of careful monitoring and selection of appropriate drugs.

Our study found significant relationships between age, parity, previous experience with epidural analgesia, diabetes, hypertension, obesity, and whether the patient requested the epidural or it was offered, with satisfaction levels. The particularly high chi-square values for age (34.95) and parity (47.76) indicate strong associations with satisfaction. Previous experience with epidural analgesia also showed a significant relationship (chi-square = 39.85), suggesting that prior knowledge and expectations may influence satisfaction. This is consistent with findings from Lally et al. (2014) [12], who emphasized the importance of managing patient expectations and providing adequate information to enhance satisfaction with labor analgesia. Furthermore, a study by Adams et al. (2015) [1] corroborates these findings, noting that prior exposure to epidural analgesia and informed decision-making significantly improve patient satisfaction.

This research adds to the body of knowledge by providing detailed insights into the sociodemographic factors associated with satisfaction and complications related to epidural analgesia, informing clinical practice and improving patient care. In conclusion, this study reinforces the effectiveness of epidural analgesia in improving patient satisfaction during labor. However, it also highlights the need to address potential complications to enhance the overall childbirth experience. Recommendations include providing comprehensive information to expectant mothers about the benefits and risks of epidural analgesia and ensuring timely administration to meet patient expectations. Limitations of this study include its retrospective design and the single-center setting, which may limit the generalizability of the findings. Future research should focus on prospective, multi-center studies to validate these findings and further explore the factors influencing patient satisfaction with epidural analgesia.

Conflict of Interest
Not available

Financial Support
Not available

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