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Case Report

Maternal Satisfaction and Clinical Determinants of Epidural Analgesia for Labor Pain Relief: A Comparative Study of Air vs. Saline LOR Techniques

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Abstract

Background: *Epidural analgesia is a popular choice for labor pain relief, and patient satisfaction is a critical patient-centered outcome that impacts both the child and the mother. However, there is limited evidence regarding the correlations between patient satisfaction and clinical determinants. Our aim is to assess the maternal satisfaction in childbirth and epidural pain relief, comparing air and saline techniques.*

Methodology: *We conducted an audit among parturient who received epidural analgesia between September and November 2021, after obtaining institutional ethics permission from Institutional Review Board at Faculty of Medicine, Jordan University of Science and Technology. We compared patient satisfaction between the two techniques of epidural LOR air vs saline. Demographic, obstetric, and anesthetic data were collected, and maternal satisfaction with childbirth was assessed using a questionnaire. Satisfaction with epidural analgesia was reported by the parturient during the post-epidural round, conducted by anesthesia residents, 24 to 48 hours after birth. Findings were analyzed and interpreted using descriptive and inferential statistics.*

Results: *This clinical audit included a total of 116 women. The majority of women (97.4%) expressed satisfaction with the epidural anesthetic procedure, with 98% indicating that they would recommend the technique utilized in our hospital without any reservations and would choose to undergo the procedure again at same hospital. During the clinical audit, we assigned women to the investigation protocol, with 56 women to the Saline LOR group and 60 to the Air LOR group. The average BMI (Kg/m²) was higher in the Saline LOR group (27.4 ± 5.5) compared to the Air LOR group (24.8 ± 3.9). The loss of resistance (LOR) was higher in the Saline LOR group (6.0 ± 1.1) compared to the Air LOR group (4.8 ± 0.96, p <0.001). Other variables, such as maternal age, cervical dilation at insertion, and duration of epidural, were found to be insignificant (p > 0.05).*

Conclusion: *Overall, the findings showed a high level of satisfaction during childbirth among mothers who received epidural analgesia. A significant proportion of parturient also expressed a preference for epidural analgesia due to its potential in providing intrapartum pain relief. The risk of major consequences from epidural analgesia can be reduced through careful patient evaluation, expertise hands for catheter placement, and appropriate drug dosing.*

Keywords: *Analgesia, Childbirth, Maternal satisfaction, Intrapartum, Epidural analgesia.*

Introduction

One of the most gratifying and exciting moments in medicine is the delivery of a newborn into the arms of a healthy and pain-free mother **((**Khan et al., 2022**))**. However, a healthy baby is just one aspect of an "excellent birth." According to the World Health Organization **(**WHO**)**, "high-quality care" should encompass both the provision of services and the woman's experience **(**Simelela, 2018**)**. labor pain is often described as one of the most intense sensations a woman can experience **((**Hoffmann & Banse, 2021**))**. Pain encompasses a wide range of conditions, from acute surgery-related symptoms to chronic, site-specific, or generalized pain **(**Shnol et al., 2014**)**. Among these, each woman's perception of labor is influenced by various factors, making each experience unique. However, in terms of pain intensity, labor pain consistently ranks high compared to other challenging life events.

In general, the events and interactions that occur during labor have significant psychological effects and play a vital role in the well-being of both the mother and her child. Maternal satisfaction with postpartum healthcare services is important for determining the standard of treatment received. Maternal satisfaction is difficult to ensure in settings with limited resources due to things like a lack of skilled delivery personnel, limited access to necessary medical supplies, and a lack of needed medications **(**Amoah et al., 2022**)**. Low levels of health literacy, poor provider-patient communication, norm-breaking, a lack of emphasis on pain treatment, an overabundance of medical interventions, a lack of women's involvement, and high healthcare expenses all affect postpartum care for mothers **(**Mastylak et al., 2023**)**. As pain holds great importance in childbirth, effective management of labor pain significantly influences a woman's overall satisfaction during the birthing process **(**Labor & Maguire, 2008**)**.

Several factors influence a woman's desire for and choice of pain relief during labor, including her expectations, the complexity of her labor process, and the intensity of her pain. For many women, labor pain is excruciating, and most of them require some form of pain medication (O'Brien et al., 2014). Women employ a variety of pain control techniques during childbirth, including both non-pharmacological and pharmacological interventions. Non-pharmacological interventions such as intracutaneous or subcutaneous sterile water injections, immersion in water, relaxation techniques (yoga, music, audio)(Smith, Levett, Collins, Armour, et al., 2018), hypnosis, aromatherapy, biofeedback, acupuncture or acupressure, manual methods (massage, reflexology), and transcutaneous electrical nerve stimulation (TENS) primarily aim to help women cope with labor pain(Smith, Levett, Collins, Dahlen, et al., 2018). Pharmacological interventions, on the other hand, primarily focus on providing relief from labor pain and may include inhaled analgesia, opioids, non-opioid drugs, local anesthetic nerve blocks, epidural and intrathecal injections of local anesthetics or opioids, or a combination thereof ((Krishna Prasad et al., 2020)).

Epidural anesthesia involves the administration of local anesthetics, sometimes combined with opioids, into the epidural space to induce a temporary loss of sensation and motor function. This technique is commonly referred to as Epidural Analgesia. Local anesthetics work by blocking sodium channels in nerve cell membranes, thereby inhibiting the propagation of nerve impulses (NICE, 2017). Epidural analgesia, which involves the injection of local anesthetic near the nerves responsible for transmitting pain, is considered the most effective method of pain relief during labor. It also allows for localized anesthesia during obstetric interventions such as cesarean sections and forceps deliveries. Additionally, it benefits patients who are at risk of obstetric interventions, including those who are obese (Labor & Maguire, 2008). The loss of resistance (LOR) technique is the widely accepted and commonly employed method for identifying the epidural space (Duniec et al., 2019). This approach typically involves the use of either air or saline, which are the two most frequently utilized procedures in this context (Wantman et al., 2006). To determine if the epidural needle tip has moved from the ligamentum flavum into the epidural space, the LOR method uses air, saline, or a mix of both induce a distinct change in resistance (Kim et al., 2012). Numerous studies comparing epidural analgesia with other techniques have been conducted, and several studies have shown that epidural analgesia provides superior pain relief during labor, leading to higher levels of maternal satisfaction (Panth & Kafle, 2018; Mocumbi et al., 2019). The objective of this audit is to evaluate mothers' satisfaction during labor, particularly while using epidural analgesia. It compares two different loss of resistance (LOR) methods, air, and saline, and investigates potential clinical variables that can influence maternal satisfaction levels.

Methodology

Material and Methods

This audit was conducted at Galway University Hospital in Ireland and King Abdullah University Hospital in Jordan. It included 116 women who participated in the audit. The women received continuous epidural infusion of intrapartum bupivacaine 0.125% + fentanyl 2µg/mL at a rate of 10-15mL/h. The primary aim of this audit was to assess the level of pain relief and satisfaction among women using epidural analgesia during labor. Epidurals are known to provide more effective pain relief during labor compared to other methods, and they can contribute to increased maternal satisfaction with pain relief. However, it is worth noting that some women who receive epidurals instead of opioid medications may have a higher likelihood of requiring assisted vaginal birth. This finding is likely influenced by the historical use of higher concentrations of local anesthetics in epidurals, rather than the lower concentrations used in modern epidurals.

Inclusion and Exclusion criteria:

Pregnant women in labor between the age of 18-45 years, ASA class 1 and 2, Epidural duration more than 45 minutes after insertion were included in this audit. Whereas women less than 18 or more than 45 years, undergone combined spinal Epidural technique, duration of Epidural less than 45 minutes after insertion, women having spine anomalies were excluded.

Our audit consisted of two main parts:

Part 1: Questionnaires were used to assess maternal satisfaction with childbirth, including a four-point Likert scale related to the effectiveness of intrapartum pain relief using the epidural analgesic technique.

Part 2: A comparison was made between the Saline Loss of Resistance **(**LOR**)** technique and the Air LOR technique.

Data Collection and Analysis

The data was collected manually using the audit data collection form **(**Appendix**)** by Anesthesia residents and registrars, all 116 women included in this audit received continuous epidural infusion of intrapartum Levobupivacaine 0.125% + fentanyl 2µg/mL at a rate of 10-15mL/h. The epidural analgesic was

administered in the labor ward, with the patient in a sitting posture. An epidural catheter was placed in one of the vertebral interspaces **(**L1-L2, L2-L3, or L4-L5**)**. Prior to administration, a small amount of local anesthetic **(**3 ml of 2% lidocaine**)** was delivered through the catheter while the patient was in a supine posture.

The pregnant women's heart rate and arterial pressure were monitored at 5-minute intervals, and continuous fatal heart rate monitoring. Once it was determined that no adverse effects such as hypotension or fetal bradycardia occurred, Levobupivacaine 0.125% and fentanyl 2mcg/ml were administered. All observations were conducted at 1 hour after epidural anesthesia and within 24 hours after delivery on postpartum day one. The women were surveyed about their birthing experience and the administered analgesic regimen. Some patients experienced pain scores, nausea, vomiting, pruritus, postpartum neurological deficits, backache, and headache. Additional epidural top-ups and rescue analgesics were required by some patients during the process. Early postpartum recollections revealed high satisfaction with epidural analgesia and lower satisfaction with alternative pain relief methods. Throughout the study, uterine contractions and relaxations were observed. Patient satisfaction with intra partum pain relief was measured using a scoring system, with a score of 4 indicating extreme satisfaction, 4 indicating strong satisfaction, 3 indicating satisfied, 2 indicating dissatisfaction, and 1 indicating very dissatisfied. A mean score of ≤3 indicated dissatisfaction, while a mean score of >3 indicated satisfaction. In this hospital setting, to account for potential hesitation in expressing negative opinions, a neutral score was considered dissatisfied. The impact of intra-partum analgesia on postpartum maternal back pain, neck pain, headache, and migraine remain undetermined. Back pain was common before, during, and after pregnancy. Overall Patient satisfaction during labor after delivery.

Sample size calculation

t tests - Means: Difference between two independent means **(**two groups**)**

Analysis: A priori: Compute required sample size

Input: Tail**(**s**)**	=	Two
Effect size d	=	0.52
α err prob	=	0.05
Power **(**1-β err prob**)**	=	0.80

Allocation ratio N2/N1	=	1

Output:

Noncentrality parameter δ	=	2.8481573
Critical t	=	1.9802722
Df	=	118
Sample size group 1	=	60
Sample size group 2	=	60
Total sample size	=	120

4 patients have not answered some questions due to missing 56 women were from Saline LOR group and 60 to the Air LOR group. Hence the total sample size taken were 116. **(**56 from Saline LOR and 60 from Air LOR group**)**

Statistical Analysis

This audit took place in Galway University Hospital, Ireland, and King Abdullah University Hospital, Jordan, between Sep/2021 and Nov/2021. 116 laboring women who received epidural analgesia were included in this audit., in 56 women saline was used for LOR and in 60 women, air was used for LOR. Data was collected in special from 24 to 48 hours after epidural insertion. Data variables included age, ASA class, Gestational age, parity, stage of labour, patients' satisfaction over pain relief in percentage, duration of the epidural block, top-up of epidural, infusion rate of epidural, postnatal complications. $p<0.05$ is considered statistically significant.

Results

A total of 116 women were included in this audit and were assigned to the investigation protocol, with 56 women assigned to the Saline LOR group and 60 to the Air LOR group. The Saline LOR group exhibited a higher body mass index **(**BMI**) (**27.42±5.53**)** compared to the Air LOR group **(**24.84±3.87**)**. The loss of resistance **(**LOR**)** value was also higher in the Saline LOR group **(**6.04±1.09**)** compared to the Air LOR group **(**4.76±0.86**) (**$p<0.001$**)**. Regarding parity, it was observed that 57.8% of the participants were

nulliparous, with a higher percentage of nulliparous participants in the Saline LOR group (67.9%).

Conversely, the majority of participants in the Air LOR group were multiparous (51.7%). A statistically significant association was found between parity and the Epidural LOR technique, as indicated by a p-value of 0.033, which is below the threshold of 0.05. Other variables, including maternal age, cervical dilation at insertion, duration of epidural, number of attempts for epidural insertion, and gravidity, were found to be statistically insignificant (p>0.05) in their association with the Epidural LOR technique. These results are summarized in Table 1. Regarding the loading of medications, the majority of participants (73.3%) received L-Bupi 0.125%+Fent 2.5mcg/ml.

Parameters	Group SLOR (N=56)	Group ALOR (N=60)	p value
Maternal age (y)	32.9±5.6	33.0±5.0	0.942
BMI (kg/m2)	27.4±5.5	24.8±3.9	0.004**
LOR (cm)	6.0±1.1	4.8±0.9	0.000**
Cx Dilation at insertion (cm)	3.8±2.0	3.6±1.9	0.477
Duration of Epidural (min)	295.6±194.6	290.0±188.1	0.875
Number of attempts for epidural insertion	1.4±0.7	1.4±0.7	0.545
Gravidity			0.196
Primigravida	31(55.4)	26(43.3)	
Multigravida	25(44.6)	34(56.7)	
Parity			0.033*
Nulliparity	38(67.9)	29(28.3)	
Multiparity	18(32.1)	31(51.7)	

Table 1. The difference in mean maternal age, BMI, LOR. Cx dilation at insertion, duration of epidural, degree of satisfaction, number of attempts for epidural insertion, gravidity and parity and between SLOR and ALOR.

*Results are presented as mean±standard deviation for quantitative variables and N (%) for qualitative variables, **p<0.01, *p<0.05.*

Abbreviations: SLOR, saline loss of resistance; ALOR, air loss of resistance; BMI, body mass index.

Among the participants who underwent saline LOR, a high proportion (87.5%) also received L-Bupi 0.125%+Fent 2.5mcg/ml. Conversely, in the air LOR group, the majority (60.0%) received L-Bupi 0.125%+Fent 2.5mcg/ml. A statistically significant association was found between the loading regimen and the Epidural LOR technique, as indicated by a p-value of 0.005, suggesting a meaningful relationship. However, when assessing variables such as satisfaction, modality of pain relief, mode of birth, replacement of epidural, reasons for low satisfaction, epidural infusion, top-up requirement, and complications during or after epidural insertion, no significant associations with the epidural LOR technique were observed. The p-values for these variables were greater than 0.05, indicating a lack of meaningful relationship between them and the Epidural LOR technique. Therefore, no significant associations were found between the Epidural LOR technique and satisfaction level, modality of pain relief, mode of birth, replacement of epidural, reasons for low satisfaction, epidural infusion, top-up requirement, and complications during or after epidural insertion Table 2.

Parameters	SLOR (N=56)	ALOR (N=60)	Total	*p* value
Unsatisfied	2(3.6)	1(1.7)	3(2.6)	0.518
Satisfied	54(96.4)	59(98.3)	113(97.4)	
Modality Pain Relief				0.212
Regional	24(42.9)	19(31.7)	43(37.1)	
Inhalational and Regional	32(57.1)	41(68.3)	73(62.9)	
Mode of Birth				0.108
AVD	21(37.5)	18(30.0)	39(33.6)	
SVD	16(28.6)	28(46.7)	44(37.9)	
CS cat 1 under EB	0(0.0)	2(3.3)	2(1.7)	
CS cat 1 under GA	1(1.8)	0(0.0)	1(0.9)	
CS cat 2 under EB	18(32.1)	12(20.0)	30(25.9)	
Replacement of epidural				0.140
No	54(96.4)	60(100.0)	114(98.3)	
Yes	2(3.6)	0(0.0)	2(1.7)	
Reason of low satisfaction				0.695
No pain relief	1(12.5)	1(11.1)	2(11.8)	

Unilateral pain relief	3(37.5)	5(55.6)	8(47.1)	
Pressure pain during contractions	3(37.5)	3(33.3)	6(35.3)	
Patchy block	1(12.5)	0(0.0)	1(5.9)	
Epidural Infusion				
No infusion	1(1.8)	0(0.0)	1(0.9)	0.299
L-Bupi 0.125%+ Fent 2 mcg/ml	55(98.2)	60(100.0)	115(99.1)	
Loading				
L-Bupi 0.25%+Fent 2.5 mcg/ml	2(3.6)	3(5.0)	5(4.3)	
L-Bupi 0.25%+Fent 10mcg/ml	4(7.1)	4(6.7)	8(6.9)	
L-Bupi 0.125%+Fent 5mcg/ml	0(0.0)	2(3.3)	2(1.7)	0.005**
L-Bupi 0.125%+Fent 2.5mcg/ml	49(87.5)	36(60.0)	85(73.3)	
L-Bupi 0.125%+Fent 10mcg/ml	0(0.0)	8(13.3)	8(6.9)	
L-Bupi 0.125%	1(1.8)	7(11.7)	8(6.9)	
Top-up requirement				
0	29 (59.2)	35 (58.3)	64 (58.7)	
1	7 (14.3)	17 (28.3)	24 (22.0)	
2	9 (18.4)	4 (6.7)	13 (11.9)	0.149
3	3 (6.1)	4 (6.7)	7 (6.4)	
7	1 (2.0)	0 (0.0)	1 (0.9)	
Complication during or after epidural insertion				
Dural puncture	4 (26.7)	1 (20.5)	5 (25.0)	
Failed first epidural and epidural resited	1 (6.7)	2 (40.0)	3 (15.0)	
Feeling of pain in one spot in right thigh	1 (6.7)	0 (0.0)	1 (5.0)	
Hypotension post-epidural loading	4 (26.7)	1 (20.0)	5 (25.0)	0.689
Inadequate pain relief [pressure pain]	3 (20.0)	1 (20.0)	4 (20.0)	
Low level of block in left side	1 (6.7)	0 (0.0)	1 (5.0)	
Low level of block in right side	1 (6.7)	0 (0.0)	1 (5.0)	

Table 2. Association between satisfaction, modality pain relief, mode of birth, replacement of epidural, reason of low satisfaction, Epidural Infusion and loading between saline and air LOR.

*Results are presented as mean±standard deviation for quantitative variables and N(%) for qualitative variables, **p<0.01, *p<0.05.*

Abbreviations: SLOR, saline loss of resistance; ALOR, air loss of resistance; BMI, body mass index.

Table 3 presents the results of a binary logistic regression, to assess the relationships between various independent variables and a binary outcome variable. In model 1, LOR (Cm) is negatively significant with coefficient -1.492 and p-value of 0.000. The odds ratio is 0.225, for each unit increase in LOR, the odds of the outcome decrease by a factor of 0.225. The other variables age, BMI, and Cx dilation at insertion are found to be insignificant. In model 2, there is no change LOR (Cm) is negatively significant with coefficient -1.544 and p-vale of 0.000 The odds ratio is 0.213, for each unit increase in LOR, the odds of the outcome decrease by a factor of 0.213. The other variables age, BMI, Cx dilation at insertion, number of attempts for epidural insertion, gravidity, parity and duration of epidural are found to be insignificant.

Figure 1 reveals 98.3% of the respondents were satisfied with air LOR while 96.4% were satisfied with saline LOR.

		Beta	S.E.	p value	Odds ratio	95% C.I.for EXP(B)	
						Lower	Upper
Model 1	Age (in years)	-0.039	0.045	0.385	0.961	0.880	1.051
	BMI	0.021	0.060	0.730	1.021	0.907	1.149
	LOR (Cm)	-1.492	0.317	**0.000****	0.225	0.121	0.418
	Cx Dilation at Insertion cm	-0.085	0.120	0.476	0.918	0.726	1.161
	Constant	9.096	2.629	0.001			
Model 2	Age (in years)	-0.044	0.051	0.385	0.957	0.867	1.057
	BMI	0.001	0.061	0.989	1.001	0.888	1.128
	LOR (Cm)	-1.544	0.342	**0.000****	0.213	0.109	0.417
	Cx Dilation at Insertion cm	-0.067	0.130	0.603	0.935	0.725	1.205
	Number of attempts for epidural insertion	0.276	0.361	0.445	1.318	0.649	2.675
	Gravidity (1)	-1.274	0.960	0.184	0.280	0.043	1.836
	parity (1)	1.883	0.994	0.058	6.573	0.937	46.097
	Duration of Epidural (Min)	0.002	0.002	0.143	1.002	0.999	1.005
	Constant	8.818	2.731	0.001			

Table 3. Association between age, BMI, LOR, Cx dilation at insertion, number of attempts for epidural insertion, gravidity, parity and duration of epidural between saline and air LOR.

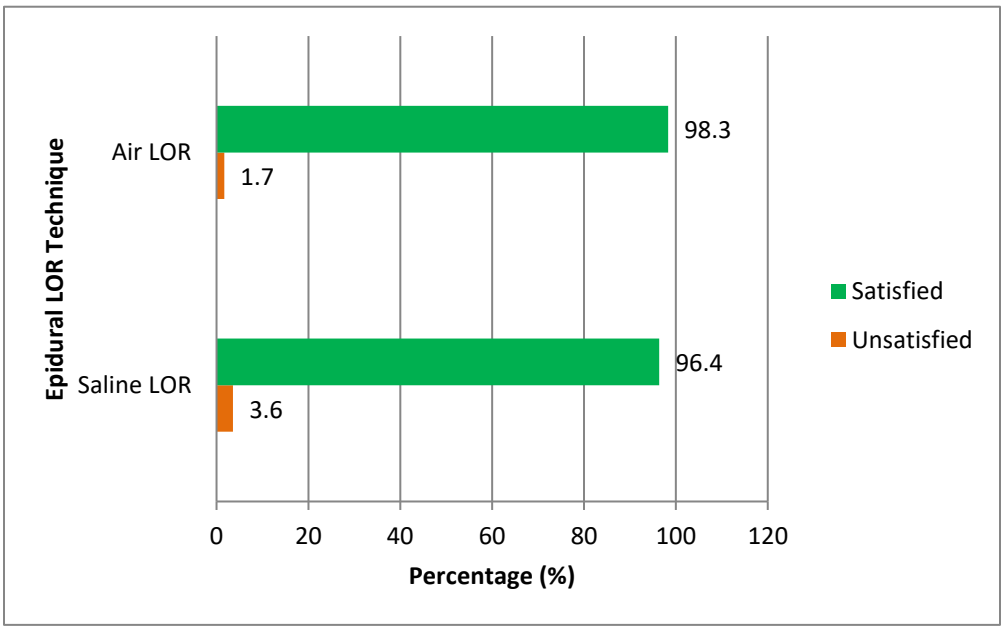

Figure 1. Percentage of respondent's satisfied and unsatisfied between saline and Air LOR

Discussion

Epidural anesthesia, which relies on the accurate identification of the epidural space, holds great significance in the field of anesthetic practice. Since Dogliotti's initial demonstration in 1933, this procedure has undergone significant advancements in syringe, needle, catheter, and technique. The debate regarding the superiority of saline versus air for detecting resistance loss has persisted over time **(**Dhansura et al., 2015**)**. In our group of patients under study, 96.4% of the 56 individuals who underwent saline LOR and 98.3% of the 60 women who chose air LOR expressed complete satisfaction **(**i.e**)** in total 113**(**97.4%**)** patients. These findings align with previous research, such as Gredilla et al **(**2008**)**, who reported a satisfaction rate of 91.3% regarding the process of epidural anesthesia. Similarly, **(**Marenco-Arellano et al. **(**2017**)**. found a high level of satisfaction with epidural anesthesia, with 100% of participants indicating their willingness to repeat the method in the future. **(**Brogly et al., 2018**)** has reported reduction in pain for the patients who receive epidural analgesia using either the ALOR or SLOR technique. In contrast to this **(**Norman, 2003**)** suggested use of saline to provide expectant moms with quicker and more efficient pain relief and to ensure their satisfaction and comfort during birthing. Other studies, including Yurashevish et al. **(**2019**)** and **(**Tchounzou, 2020**)** in Cameroon, reported satisfaction rates of 78% and 79.79%, respectively.

However, our findings contrast with a study conducted by (Tan et al., 2018) in Singapore, where only 35.9% and 32.2% of patients reported feeling very satisfied and satisfied, respectively (Tan et al., 2018). Notably, our study revealed that 114 participants (98.3%) would recommend this technique and expressed no desire for an alternative method. The three cases of dissatisfaction were attributed to inadequate pain relief, pressure pain during contractions, and a patchy block effect.

Our findings indicate that there was no significant difference in pain reduction between women who underwent regional anesthesia alone and those who received a combination of regional anesthesia and inhalational analgesia (p=0.212). This aligns with the results reported by Fyneface Ogne et al. (2009), where 88% of women in the epidural group experienced adequate pain relief compared to only 4% in the non-epidural group (parenteral/opioid). A systematic review conducted by Howell (1999) further supports our findings, suggesting that epidural analgesia may be more effective in reducing pain during labor and increasing maternal satisfaction with pain management. This conclusion was drawn from an analysis of 52 studies involving approximately 11,000 women.

Our audit findings revealed that the loss of resistance technique using air, rather than saline, formed the basis of our observations. However, a systematic review conducted by Antibas et al. (2011), which examined seven studies, reported no significant difference between air and saline when employing the loss of resistance technique. In contrast to our findings, Y Beilin et al. reported that the use of 0.9 percent saline for the loss of resistance method resulted in greater analgesia compared to air for labor analgesia (Beilin, 2000). A literature review conducted by Shenouda & Cunningham, (2003) concluded that utilizing a low concentration of saline, instead of air, for loss of resistance yielded optimal results. Similarly, in their audit, S. Leo et al. discovered that among patients who received combined spinal epidural analgesia for labor, loss of resistance to air was associated with a higher risk of recurrent breakthrough pain compared to loss of resistance to saline (Leo et al., 2008). There were no significant differences in patients' demographic characteristics, including maternal age, cervical dilation at insertion, and duration of epidural, between the air and saline groups. However, the loss of resistance to saline technique was associated with a higher body mass index (BMI) compared to the air group (p=0.004). It was hypothesized that the higher BMI in the saline group might be attributed to an increase in maternal age among multiparous women. This finding is consistent with the results reported by Tai-Ho Hung et al. (2015), who demonstrated higher prepregnancy BMI and gestational diabetes mellitus in multiparous women compared to nulliparous women.

Several studies have highlighted the association of fentanyl and bupivacaine in improving maternal satisfaction (e.g. (Ayşegül, 2017). In our audit, the majority of patients (n=85) received L-Bupi 0.125%+Fent 2.5mcg/ml. We observed a significant difference in the loading dose between the air LOR (60%) and saline LOR (87.5%) groups (p=0.005). Ayşegül et al. (2017) demonstrated that the combination of 0.125% bupivacaine and 2 mcg/ml fentanyl provided better levels of analgesia and maternal satisfaction compared to the combination of 0.0625% bupivacaine and 2 mcg/ml fentanyl for labor analgesia.

Our clinical audit has several limitations that should be acknowledged. Firstly, the time period of the audit was relatively short, spanning from September to November 2021, which may have resulted in a reduced number of patients included in the study due to the impact of the COVID-19 pandemic. A larger sample size and a higher frequency of intrapartum epidural analgesia cases would be necessary to ensure a comprehensive understanding and draw more definitive conclusions.

Another limitation stems from the fact that this audit was conducted within a single hospital setting. The procedures for epidural analgesia, labor management, and criteria for surgical intervention may vary across different healthcare facilities. Therefore, the generalizability of our findings to diverse clinical contexts should be carefully considered. Patient satisfaction is a complex and multidimensional measure that encompasses various factors, including the patient's individual experiences, obstetric care, anesthesia practice, and psychological factors. During the interview conducted by the anesthetic service, patients might have felt obliged to express higher levels of satisfaction due to being in the hospital environment and potentially desiring additional attention from the attending anesthetist. Moreover, patient satisfaction is influenced by numerous factors beyond the scope of this audit, such as family support, environmental factors, and changes in mood. These additional variables may have impacted the satisfaction rate reported by the patients. These limitations should be considered when interpreting the findings of this audit and considering its implications in clinical practice. Further research with a more extensive scope and diverse settings is warranted to gain a more comprehensive understanding of patient satisfaction in the context of epidural analgesia.

Conclusion

In conclusion, our study revealed a high level of satisfaction among mothers who received epidural analgesia during childbirth. The advantages of epidural analgesia, such as its potential for providing effective intrapartum pain relief, contributed to a significant preference for this method among parturient. Over the past decade, women's expectations regarding pain management during labor have evolved, and epidural analgesia has emerged as a widely sought-after option for alleviating labor pain. It is crucial to provide each woman with objective information regarding the risks and benefits of epidural analgesia, as well as alternative pain-relieving options, well in advance of labor. By carefully evaluating patients, ensuring expert procedure during epidural catheter placement, and administering appropriate drug doses, the risk of major complications associated with epidural analgesia can be minimized. Overall, our findings emphasize the importance of comprehensive pain management strategies in childbirth, with epidural analgesia playing a significant role in meeting the evolving expectations and preferences of women seeking effective pain relief during labor. Continued research and ongoing efforts to enhance patient education and safety protocols will further contribute to the optimal utilization of epidural analgesia in clinical practice.

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