ORIGINAL ARTICLE

A Survey of Aseptic Techniques for Labor Epidurals by Anesthesiologists in Tertiary Care Hospitals of Karachi

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Abstract

Background: This study aimed to investigate the current practices of physicians regarding the essential components of aseptic precautions during labor epidural anesthesia in tertiary care hospitals in Karachi. By understanding the perspectives of anesthesiologists on aseptic techniques, this research seeks to inform improvements in clinical practice and the development of standardized care in this critical aspect of obstetric anesthesia.

Methods: One hundred forty-five anesthesiologists from several Karachi teaching facilities were enrolled in this cross-sectional survey through a convenience sampling technique. Upon their voluntary consent, they were provided with the questionnaire to administer, their demographic information, and preoperative, surgical, and postoperative practices.

Results: A total of 145 anesthesia consultants and specialists consisting of 37.93% female and 62.07% male practicing in Karachi's tertiary care hospitals were included in this survey. The average age of the participants was 33.50±6.95 years. Most (73%) worked in private institutes, and 27% worked in public. Regarding aseptic preparation, 75.2% of anesthesiologists used pyridine before conducting epidurals, while >85% removed their accessories and followed the protocol of sterilization. Most participants (>50%) used appropriate solutions for sterilization and perceived cleanliness. In comparison, nearly 82% to 89% of respondents agreed that all patients and support personnel in the room needed to wear head and face masks.

Conclusion: The survey highlights the variability in the practice of aseptic technique among anesthesiologists during labor epidural insertion. The findings underscore the need for evidence-based guidelines to standardize procedures and enhance patient safety.

Keywords

Labor, Epidural, Obstetrics, Sterilization.

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Introduction

The meticulous practice of aseptic technique during the insertion of epidural catheters is paramount in preventing contamination and associated complications, particularly in obstetric settings where the stakes are high[1-2]. Despite the rarity of complications stemming from labour epidurals, the potential outcomes of such events can be catastrophic, leading to significant morbidity or even mortality[3-4]. While published standards exist for aseptic technique during epidural catheter insertion, adherence to these guidelines needs to be well-documented, and there is controversy surrounding which components of sterile technique are considered essential among physicians[5-7].

The importance of maintaining asepsis during epidural placement cannot be overstated, as breaches in sterile technique by anesthesiologists or the introduction of bacteria from distant sites can lead to serious infections[8]. Various sources, including contaminated equipment or solutions and skin contaminants, underscore the critical need for meticulous attention to aseptic technique[9-10]. Several professional bodies have issued guidelines regarding emerging concerns about practicing proper aseptic techniques and adherence to standardized protocols. However, the evidence supporting these guidelines may be limited[11]. Despite assumptions that improvement in technical skills parallels enhanced aseptic technique, studies have shown that this may only sometimes be the case.

Unfortunately, anesthesiologists have gained a reputation for their inconsistent adherence to basic aseptic practices, particularly in terms of inadequate handwashing routines. This issue is compounded by the frequent physical contact anesthesiologists have with numerous surgical patients in the post-anesthesia care unit (PACU) and with high-risk infected patients in the intensive care unit (ICU). Studies have highlighted that hand contamination among anesthesiologists is a significant factor in the intraoperative transmission of bacteria. Given the combination of heightened exposure to infectious agents and suboptimal hand hygiene practices, there are concerns regarding the provision of neuraxial anesthesia to healthy laboring women[12].

Given these considerations, this study aimed to investigate the current practices of physicians regarding the essential components of aseptic precautions during labor epidural anesthesia in tertiary care hospitals in Karachi. By understanding the perspectives of anesthesiologists on aseptic techniques, this research seeks to inform improvements in clinical practice and the development of standardized standards of care in this critical aspect of obstetric anesthesia.

Methodology

Study Design

This cross-sectional study was conducted to evaluate the aseptic methods employed in labor epidurals by anesthesiologist. The data was collected from several Karachi teaching facilities, including The Indus Hospital, Aga Khan University Hospital, Jinnah Postgraduate Medical Centre (JPMC), Civil Hospital Karachi, and Liaquat National Hospital.

Sample Size and Sampling Technique

Based on computations with Open EPI software, a sample size of n=145 anesthesiologists with a 95% confidence interval and an 8% absolute precision was established. The study utilized non-probability convenience sampling in order to select participants.

Inclusion Criteria

- Anesthesia consultants and specialists are working in Karachi's tertiary care facilities.
- Residents in anesthesia (FCPS & MCPS).
- Willingness to take part and give permission.

Exclusion Criteria

- Anesthesiologists working in primary and secondary care setups.
- <3 years of experience in the field.
- Those who declined to give consent.

Data Collection Procedure

The Institutional Review Board (IRB) of The Indus Hospital and the College of Physicians and Surgeons Pakistan (CPSP) approved this study. Furthermore, permission was obtained from the chairperson or person in the anesthesia department of each tertiary care hospital surveyed before conducting the survey. The Principal Investigator (PI) addressed anesthesiologists who fit the inclusion criteria, outlining the goal of the research survey and getting verbal consent. Those who gave their consent were sent a link to an online questionnaire, which they were to complete and send back to the PI. Preoperative, surgical, and postoperative practices, as well as demographic information, including age and qualification, were included in the questionnaire.

Data Analysis Strategy

Descriptive statistics were computed for quantitative characteristics, including age, years of experience, and the number of epidurals administered. For categorical variables, including gender, designation, and institute type, frequencies and percentages were calculated. Stratification analysis was carried out to address effect modifiers, including age, years of experience, and institute type. Following stratification, Fisher exact tests or Chi-square testing were used. A p-value of less than 0.05 was deemed statistically significant.

Results

A total of n=145 anesthesia consultants and specialists practicing in tertiary care hospitals of Karachi were included in this survey. The average age of the participants was 33.50±6.95 years. The mean duration of independent work and the number of labor epidurals in a month and per year were also reported in Table-1.

Table-1 Patients Characteristics of the Participants(n=145)

Variables	Mean±SD	Median	IQR
Age (Years)	33.50±6.95	32	7
Duration of work independently (Years)	4.20±4.95	3	3
Labor epidurals do you perform/supervise in a month?	8±8.9	5	7
Epidurals are performed at your center per year	200.30±311.8	100	250

In this survey, there were 37.93% female and 62.07% male amongst which 50% were residen ts, 36% were specialists, and 14% were consultants. Most (73%) worked in private institutes and 27% were in public. There were, 42.76% of participants associated with university teaching hospitals, 49.7% with non-teaching community hospitals, and 7% in both. Regarding aseptic preparation, 75.2% of anesthesiologists say they used pyridine up to their elbows and dried it with sterile towels before conducting epidurals. Nearly 89% of respondents said they had removed their jewelry and watches, while 11% said they had not. Out of 145, 124(85.5%) wore sterilized gowns and gloves, and 85.5% wore surgical hats and face masks (Table-2).

Table-2 Questions on Aseptic Preparation

Questions	Categories	n (%)
How do you wash your hands before performing epidurals?	With pyodine up to elbow and pat dry with sterile towel	109 (75.2%)
	With pyodine without extending up to elbows	16 (11.0%)
	With Isopropyl Alcohol (prior donning sterile gloves)	20 (13.8%)
	Don't consider hand wash at all	0 (0.0%)
Which of the following do you practice while performing epidural?	Remove jewelry (rings, bracelets and wrist watches)	129 (89%)
	Doesn't remove anything)	16 (11%)

Wear a sterilize gown and gloves?	Only sterile gown	2 (1.4%)
	Only sterile gloves	18 (12.4%)
	Both of them	124 (85.5%)
	None of them	1 (0.7%)
Wear a surgical hat and face mask?	Only surgical hat	5 (3.4%)
	Only fresh mask	15 (10.3%)
	Both of them	124 (85.5%)
	None of them	1 (0.7%)

Table-3 displays information regarding the labor epidural techniques performed by anesthesiologists. 53.8% of respondents preferred the regular saline used in epidural trays. 69.5% of anesthesiologists used Pyodine as an antiseptic solution, and 30.5% used Chlorohexidine Gluconate and Isopropyl Alcohol. When asked whether they frequently use a filter needle to extract local anesthetic solutions, 29.2% of anesthesiologists said yes. 87.7% of participants said "Yes," and they applied it to patients' backs to create a sterile field. 54.5% of the responses requiring the application of secure dressings to preserve cleanliness at the insertion site were found to be sterile opposite or similar dressing responses. Out of 142, 58 (44.3%) participants were permitted to have just one support person in the room, and 42 (32.1%) were permitted to have more than one support person present. Nearly 82% to 89% of respondents agreed that all patients and support personnel in the room needed to wear head and face masks.

Table-3 Questions on Aseptic Techniques

Questions	Categories	n (%)
To secure and maintain the cleanliness at the insertion site, do you use?	Sterile fixation device	39 (29.5%)
	Sterile opposite or similar dressing	72 (54.5%)
	Sterile gauze with adhesive tapes	18 (13.6%)
	Adhesive tape only	3 (2.3%)
For labor epidurals with the exception of nurses and trainees, do you have a limit for number of support person in the room?	I allow only one support person in the room.	58 (44.3%)
	I allow more than one support person in the room.	42 (32.1%)
	I don't allow any support person in the room	31(23.7%)

Do you require all support individuals present in the room to wear	OR hat	8 (6.1%)
	Fresh face mask	12 (9.2%)
	Both	107 (81.7%)
	Neither	4 (3.1%)
Do you require the patient to wear an operating room hat?	Yes	118 (89.4%)
	No	14 (10.6%)

A stratification analysis was performed according to the modified effect. However, no significant difference was observed in the responses of aseptic and the preparation techniques used in labor epidurals practiced by anesthesiologists (Supplementary File).

Discussion

The findings of this survey indicate significant variability in the practice of aseptic technique among anesthesiologists during labor epidural insertion. While some physicians demonstrated adherence to recommended protocols, others displayed inconsistencies in their approach. Notably, evidence-based guidelines are essential for standardizing all aspects of epidural catheterization, encompassing preparation procedures and the insertion process. Such guidelines are imperative to ensure more stringent adherence to aseptic techniques, ultimately enhancing the protection of the obstetric population against infectious complications. Understanding the current practices among anesthesiologists in performing labor epidurals highlights areas of concern and serves as a crucial first step in formulating, updating, and enforcing much-needed aseptic guidelines[13-14]. By establishing standardized protocols, healthcare institutions can mitigate the risk of infectious complications associated with labor epidural procedures[15].

Moving forward, future recommendations include developing and implementing evidence-based guidelines tailored to all stages of epidural catheterization. These guidelines should encompass comprehensive protocols for preparation, insertion techniques, and post-procedural care[16]. Additionally, ongoing education and training programs should be provided to healthcare providers to ensure proficiency in aseptic techniques and adherence to established protocols[17]. Despite the insights gained from this study, it is essential to acknowledge its limitations. The survey may not capture the full spectrum of practices across all healthcare institutions, and responses may be subject to recall or social desirability bias. Future research should aim to conduct more comprehensive assessments across a broader range of healthcare settings to obtain a more representative understanding of current practices and to inform the development of effective interventions to improve aseptic technique during labor epidural insertion.

Conclusion

This survey highlights the variability in the practice of aseptic technique among anesthesiologists during labor epidural insertion. The findings underscore the need for evidence-based guidelines to standardize procedures and enhance patient safety. Implementing comprehensive protocols and ongoing education can improve adherence to aseptic techniques. Future efforts should focus on developing guidelines tailored to all stages of epidural catheterization and conducting further research to inform interventions aimed at improving practice consistency. Ultimately, standardized protocols and quality improvement initiatives are crucial for enhancing patient safety in obstetric anesthesia.

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Conflict of Interest

None.

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None.

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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

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All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.