

Comparison of Sitting Versus Lateral Decubitus Position During Spinal Anaesthesia On The Incidence Of Postdural Puncture Headache In Patients Undergoing Lower Segment Caesarean Section.

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I. INTRODUCTION

Spinal anesthesia stands as a crucial component in the management of lower segment caesarean section (LSCS), offering rapid onset and predictable anesthesia. However, a well-documented complication associated with spinal anesthesia is postdural puncture headache (PDPH).¹ This condition arises from cerebrospinal fluid leakage through the puncture site in the dura mater, leading to intracranial hypotension and ensuing headaches, significantly impacting postoperative recovery and patient satisfaction.²

The position of patients during spinal anesthesia administration plays a pivotal role in determining the incidence of PDPH.³ Traditionally, the sitting position has been preferred due to enhanced accessibility to the intervertebral spaces and clearer identification of anatomical landmarks. Yet, concerns have been raised regarding the heightened risk of PDPH associated with this posture compared to alternatives like the lateral decubitus position.²

In obstetric anesthesia, where swift onset and minimal maternal discomfort are imperative, understanding the impact of patient positioning on PDPH incidence remains critical. The lateral decubitus position holds potential advantages, potentially mitigating cerebrospinal fluid pressure gradients and thereby lowering PDPH rates compared to the sitting position.¹ Although theoretical underpinnings and limited clinical evidence suggest a protective effect with lateral positioning, robust clinical data directly comparing sitting versus lateral decubitus positions in the context of PDPH incidence following spinal anesthesia for LSCS are scarce.⁴

This study aims to systematically compare the incidence of postdural puncture headache between patients undergoing lower segment caesarean section under spinal anesthesia in the sitting versus lateral decubitus position.³ By exploring the impact of patient positioning on PDPH incidence, this research endeavors to provide original insights that can inform evidence-based anesthesia practices and optimize patient outcomes in obstetric anesthesia.

AIMS & OBJECTIVES:

The study is designed to compare the effect of the sitting and the lateral posture during subarachnoid blockade on the occurrence and severity of PDPH in the parturient.

II. METHODOLOGY

The study was conducted at the Department of Anaesthesiology from January 2023 to June 2023, following rigorous ethical review by the Institutional Ethical Committee, and obtaining informed consent from all participating individuals. The primary objective was to investigate the incidence of post-dural puncture headache (PDPH) associated with different patient positions during subarachnoid block anesthesia for lower segment caesarean sections (LSCS).

A total of 40 participants were recruited, with the sample size determined to achieve statistical robustness at 95% confidence level and 80% power to detect a clinically significant 15.5% difference in PDPH occurrence between groups. Participants were carefully selected, excluding pregnant women with hypertension, diabetes, or other significant medical conditions that could confound the study outcomes.

The participants were randomly allocated into two groups of 20 each: Group A received subarachnoid block anesthesia in the sitting posture, and Group B in the lateral decubitus posture. Randomization was

achieved using computer-generated random numbers to ensure unbiased group assignment and minimize selection bias.

Following the administration of subarachnoid block, all participants were monitored postoperatively for a period ranging from 1 to 5 days to assess the incidence and severity of PDPH. The Numeric Rating Scale (NRS) was employed to measure headache severity, providing a standardized and objective assessment tool. The NRS assigns a numerical value from 0 (indicating no pain) to 10 (indicating the worst possible pain), allowing for consistent measurement across different individuals and time points.

Statistical analysis was performed using SPSS software version 23.0, with significance set at $P < 0.05$ using Student's t-test. This approach aimed to identify any statistically significant differences in PDPH incidence and severity between the sitting and lateral decubitus positions.

The choice of patient positioning during subarachnoid block administration is crucial in obstetric anesthesia due to its potential impact on cerebrospinal fluid dynamics and subsequent headache development. The sitting position is conventionally preferred for its ease of access to the vertebral column and reduced technical challenges during needle insertion. However, this position may also increase the risk of PDPH due to a higher likelihood of dural puncture and subsequent cerebrospinal fluid leakage.

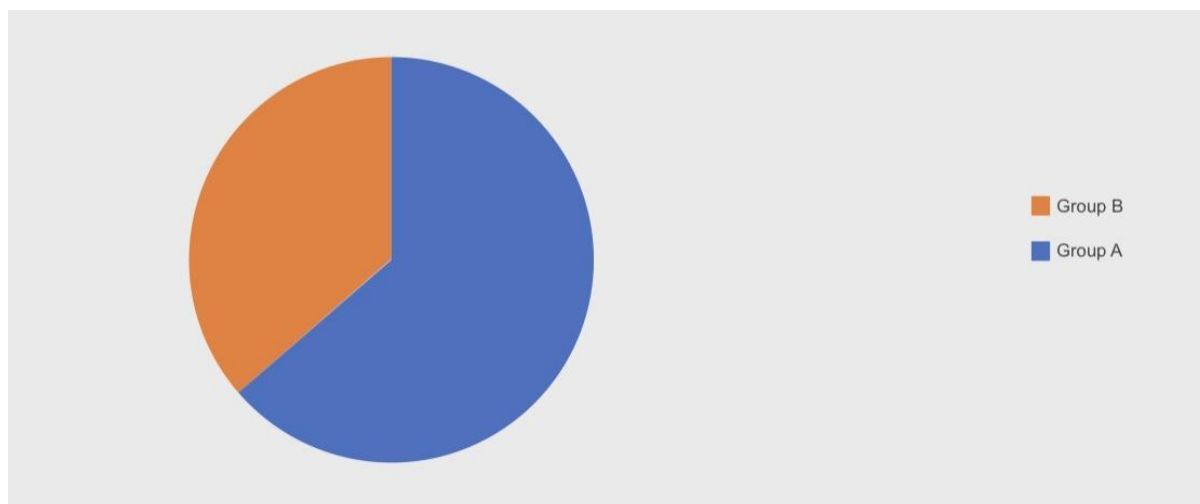
Conversely, the lateral decubitus position, where the patient lies on their side with knees and hips flexed, may theoretically reduce the risk of PDPH by minimizing cerebrospinal fluid leakage through gravitational effects and a more favorable alignment of the spinal structures. This position is often used in clinical practice to mitigate complications associated with spinal anesthesia, especially in settings where postoperative pain management and patient comfort are paramount.

Ethical considerations were strictly adhered to throughout the study, ensuring the rights, safety, and confidentiality of all participants. Informed consent was obtained from each participant, detailing the study objectives, procedures, and potential risks involved. Confidentiality measures were implemented to protect the privacy of participant data throughout the study period and during subsequent data analysis and reporting.

The findings of this study are expected to contribute valuable insights into optimizing perioperative care practices in obstetric anesthesia. By elucidating the influence of patient positioning on PDPH incidence and severity, the study aims to inform evidence-based guidelines and clinical decision-making processes. Ultimately, this research endeavors to enhance patient outcomes by minimizing the occurrence of PDPH and improving postoperative recovery and maternal satisfaction following LSCS under subarachnoid block anesthesia.

In conclusion, this study represents a significant step towards understanding the impact of patient positioning on PDPH in obstetric anesthesia. The comprehensive methodology employed rigorous scientific principles and ethical standards, ensuring the validity and reliability of the study findings. Future research endeavors may further explore additional factors influencing PDPH and expand upon strategies to optimize patient care and safety in obstetric anesthesia practice.

III. RESULTS



Post dural puncture headache (PDPH) is more seen in group A individuals who were administered spinal anaesthesia in a sitting position

Variable	Group A		Group B		P value
Post operative days	n	%	n	%	
Day 1	5	25	3	15	0.172
Day 2	11	55	4	20	0.052
Day 3	14	70	1	5	0.002 (Significant)
Day 4	4	20	1	5	0.231
Day 5	0	0	0	0	0

The incidence of post-dural puncture headache (PDPH) between Group A (sitting posture) and Group B (lateral decubitus posture) over different postoperative days:

1. **Day 1:**

- In Group A (sitting posture), 25% of patients experienced PDPH compared to 15% in Group B (lateral decubitus posture).
- The difference was not statistically significant ($P = 0.172$), suggesting similar incidence rates between the groups on the first day postoperatively.

2. **Day 2:**

- On the second day, 55% of patients in Group A reported PDPH compared to 20% in Group B.
- While there is a notable difference, the P value ($P = 0.052$) suggests that it does not reach statistical significance at the conventional threshold of $P < 0.05$, but it approaches significance.

3. **Day 3:**

- The most significant difference was observed on the third day postoperatively. In Group A, 70% of patients experienced PDPH compared to only 5% in Group B.
- This difference is highly significant ($P = 0.002$), indicating a clear association between the sitting posture and increased incidence of PDPH on the third day.

4. **Day 4 and Day 5:**

- On the fourth day, 20% of Group A patients and 5% of Group B patients reported PDPH, but the difference was not statistically significant ($P = 0.231$).
- No patients in either group reported PDPH on the fifth day postoperatively.

Interpretation:

- The data suggest that while there may not be significant differences in PDPH incidence immediately postoperatively (days 1 and 2), there is a notable increase in PDPH occurrence among patients in the sitting posture (Group A) by the third day after surgery.
- This finding underscores the delayed onset and prolonged manifestation of PDPH associated with the sitting posture during subarachnoid block anesthesia.
- Healthcare providers should consider these findings when deciding on patient positioning strategies to potentially reduce the risk and severity of PDPH following elective lower segment cesarean sections.

IV. DISCUSSION

Based on the findings of our study, we observed a higher incidence of post-dural puncture headache (PDPH) among patients positioned in the sitting posture compared to those in the lateral decubitus position. This observation is consistent with the findings reported by Davoudi et al.⁴ and Maid et al.², which also supported a greater likelihood of PDPH in the sitting posture during spinal anesthesia procedures.

Furthermore, our study noted that within Group A (sitting posture), the peak incidence of PDPH occurred on day 3 postoperatively, which corresponds with the observations made by Davoudi et al.⁴ This delayed onset of headache highlights the importance of extended postoperative monitoring to effectively manage and mitigate PDPH in patients undergoing elective lower segment cesarean section.

Symptoms such as nausea, dizziness, tinnitus, and hearing loss were significantly more prevalent among participants in the sitting posture (Group A) compared to those in the lateral decubitus posture. These findings are in line with previous research, suggesting that the sitting position may exacerbate cerebrospinal fluid leakage and subsequent symptoms associated with PDPH.

In conclusion, our study provides compelling evidence supporting the preference for the lateral decubitus position over the sitting posture to reduce the incidence and severity of PDPH in pregnant women undergoing elective lower segment cesarean section. These findings underscore the importance of careful

consideration of patient positioning during spinal anesthesia to optimize maternal outcomes and enhance patient comfort postoperatively. Future research should continue to explore optimal perioperative strategies to minimize complications associated with spinal anesthesia in obstetric patients.

V. CONCLUSION

The study findings demonstrated a higher incidence of post-dural puncture headache (PDPH) among patients positioned in the sitting group compared to those in the lateral decubitus position. This observation was particularly pronounced among pregnant women undergoing elective lower segment caesarean section under subarachnoid block anesthesia. The sitting posture, traditionally favored for its ease of access during spinal anesthesia administration, was associated with increased susceptibility to PDPH. In contrast, patients positioned laterally exhibited a lower incidence of PDPH, suggesting a potential protective effect of this posture against cerebrospinal fluid leakage and subsequent headache development.

These results underscore the importance of patient positioning in mitigating complications associated with spinal anesthesia, particularly in obstetric settings where minimizing postoperative discomfort is crucial. The study contributes valuable insights into optimizing perioperative care practices to enhance patient comfort and recovery following cesarean deliveries under spinal anesthesia.

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