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Research Article

Parturients' Anesthesia Preferences For Caesarean Section Delivery: A Prospective Observational Study

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ABSTRACT

Objective: As cesarean section (CS) rates continue to rise, the choice of anesthesia has become increasingly important. Two main anesthetic approaches are commonly used: general anesthesia (GA) and regional anesthesia (RA), the latter comprising spinal anesthesia (SA), epidural anesthesia (EA), and CS-EA. The aim of this study was to evaluate the influence of educational status, prior anesthesia experience, and procedure-related concerns on parturients' choice of anesthesia for elective CS.

Methods: Between January 2019 and December 2019, 275 pregnant women classified as American Society of Anesthesiologists II and scheduled for elective cesarean delivery at a tertiary care hospital were included in this study. Parturients were questioned in the preoperative room about age, educational level, previous birth experiences, knowledge of and concerns about SA. Subsequently, they were transferred to the operating room, where the choice of anesthesia modality was determined according to each parturient's preference.

Results: The study population primarily consisted of women with a low educational level; however, no significant association was found between the type of anesthesia used for the current CS delivery and educational level (P = 0.26). Parturients' knowledge about SA was limited, and the predominant source of information was friends and relatives. Only 19% of those who have knowledge mentioned "doctor" as the source. A statistically significant relationship was observed between the current anesthesia modality and prior anesthesia experience (P = 0.015). Fear of experiencing pain during the operation was the principal concern expressed by 37.45% of parturients.

Conclusion: Parturients preferred SA to GA across all education levels. Prior anesthesia experience led parturients to choose SA. Parturients who had experienced either general or SA prefer SA for the current operation.

Keywords: Anesthesia experience, anesthesia preference, caesarean section delivery, education level, spinal anesthesia

INTRODUCTION

The increasing prevalence of cesarean section (CS) deliveries has underscored the importance of understanding maternal preferences regarding anesthesia modalities. Two anesthetic modalities are used in procedures: general anesthesia (GA) and regional anesthesia (RA), the latter of which includes spinal anesthesia (SA), epidural anesthesia (EA), and combined SA-EA anesthesia. According to the National Anesthesia Clinical Outcomes Registry RA accounts for approximately 94.2% of anesthetic techniques used for CS in the United States.[1] The most frequently used anesthetic modality for CS delivery is single-shot SA, which is easy to apply, is associated with fewer maternal and fetal complications, and provides adequate operating conditions and patient comfort.[2-4] Despite clinical guidelines and recommendations, the choice of anesthesia

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often depends on a combination of surgical urgency, institutional practices, anesthesiologist experience, and, critically, the preferences of the parturient.[4,5] Parturients' preferences should receive priority consideration in elective cases.[6]

Although RA is widely recommended and increasingly utilized for elective CS, the factors shaping maternal anesthesia preference remain complex and context-dependent. Previous studies have explored demographic and clinical determinants; however, the interaction between prior anesthesia experience, educational level, sources of information, and procedure-related concerns has not been sufficiently examined, particularly in populations with predominantly low educational attainment. Moreover, the role of misinformation and non-medical information sources in influencing maternal perceptions and fears continues to be underreported.

Therefore, this prospective observational study aimed to investigate the determinants of anesthesia preference among parturients undergoing elective CS, with particular emphasis on demographic characteristics, educational status, prior anesthesia exposure (including experience with both general and SA), and specific maternal concerns regarding the procedure. By evaluating these variables within a real-world tertiary care setting, our study seeks to provide further insight into maternal decision-making processes and to highlight the potential importance of structured preoperative counseling in supporting informed and patient-centered anesthesia choice.

MATERIAL AND METHODS

This prospective observational study was conducted at a tertiary care hospital between January and December 2019. Of the 363 eligible parturients, 275 consented to participate and were enrolled in the study, while 88 declined participation. A total of 275 pregnant women, classified as American Society of Anesthesiologists (ASA) II and scheduled for elective CS, were enrolled. Ethical approval was obtained from the institutional review board of Van Training and Research Hospital (approval no: 2019/17, date: 12.09.2019), and all participants provided written informed consent in accordance with the Declaration of Helsinki.

Exclusion criteria included requirement for emergency CS delivery; classification as ASA status ≥ III; patients who refused to participate; multiple gestations; possibility of intraoperative hemorrhage, such as cases of placenta previa or coagulation defects; premature membrane rupture; preterm delivery (defined as before the 37th week of pregnancy); pregnancies with obstetric problems such as fetal abnormality.

Parturients were evaluated in the preoperative room by an anesthesiologist. The questions about the parturients' ages, education level, and previous births (for CS deliveries: anesthesia type and postoperative complaints) were asked of the parturients who agreed to participate, and their answers were recorded. She was also asked whether she had any knowledge of SA and where she had obtained that information. Each participant was also asked about her anesthesia preference for the upcoming CS; if SA was chosen, her specific concerns about the procedure were recorded. The recorded anesthesia modality reflected the patient's self-reported preference prior to anesthetic administration, and no institutional or clinician-driven coercion influenced the choice in elective cases. After the interview, the parturients were transferred to the operating room.

To minimize selection bias, all eligible parturients meeting the inclusion criteria were invited consecutively to participate, regardless of their demographic or clinical background. A standardized, structured questionnaire was used to ensure consistent data collection across participants; to reduce interviewer bias, the anesthesiologist followed this questionnaire and was blinded to participants' medical histories beyond the study requirements. The questionnaire was pilot-tested on 10 patients to ensure clarity and comprehensibility, and necessary modifications were made prior to the main study. Participation was voluntary, and informed consent was obtained from all participants without coercion. Additionally, we recorded the basic characteristics of non-responders to assess potential non-response bias.

Statistical Analysis

Data pertaining to the study were entered into spreadsheet software (Microsoft Excel 16.43). Statistical analyses were performed using R (version 4.0.3, R Core Team (2020). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. (URL:https://www.R-project.org/). The Wilcoxon rank-sum test was used to compare continuous variables, and chi-square tests were applied for categorical variables. A P value < 0.05 was considered statistically significant.

A post-hoc power calculation, based on the observed effect size for the association between prior anesthesia exposure and current anesthesia preference, was conducted using a chi-square test framework. With a total sample size of 275 participants and a two-sided alpha of 0.05, the study achieved a statistical power greater than 80% to detect a medium effect size (Cramér's V ≈ 0.20). This suggests that the study was adequately powered to detect clinically relevant differences in anesthesia preferences in the study population.

RESULTS

A total of 275 parturient patients were enrolled in the study. Patient characteristics are summarized in Table 1. The median age of the parturients was 29 years (range = 19-44).. Educational attainment were distributed as follows: non-literate (32%), primary school (31.27%), middle school (14.55%), high school (12.73%), and higher education (9.45%).

Of the current CS deliveries, 90 (32.73%) were primary, whereas 185 (67.27%) were recurrent CS deliveries. Among all parturients, 58 (21.09%) preferred GA for the current CS delivery, while 217 (78.91%) preferred SA. The median age (as shown in Figure 1) and education level (as shown in Table 2) did not differ significantly between anesthesia modalities (P = 0.17 and P = 0.26, respectively). Education level was not directly associated with anesthesia preference (P = 0.26); however, lower education levels were linked to reduced knowledge about SA, which may influence preference formation.

Table 1. Values are presented as median (range) for continuous variables and n (%) for categorical variables. Educational status was classified as non-literate, primary school, middle school, high school, and higher education. Prior birth history includes the number and type of previous deliveries (vaginal, CS under GA, CS under SA). Current CS delivery was categorized as primary or recurrent. Current anesthesia modality reflects the patient's preference for GA or SA.

Variable	
Age [median (range)]	29 (19-44)
Education n(%)	
Non-literate	88 (32%)
Primary school	86 (31.27%)
Middle school	40 (14.55%)
High school	35 (12.73%)
Higher education	26 (9.45%)
Prior births [median (range)]	
Total number of prior births	1 (0-8)
Number of vaginal births	0 (0-8)
Number of CS births with GA	1 (0-4)
Number of CS births with SA	0 (0-2)
Current CS delivery [n(%)]	
Primary	90 (32.73%)
Recurrent	185 (67.27%)
Current anesthesia modality [n(%)]	
GA	58 (21.09%)
SA	217 (78.91%)

CS, cesarean section; GA, general anesthesia; SA, spinal anesthesia.

MAIN POINTS

- Spinal anesthesia was the preferred anesthetic technique for elective cesarean section across all educational levels.
- Prior anesthesia experience significantly influenced current anesthesia preference, with parturients previously exposed to spinal anesthesia showing a strong tendency to choose it again.
- Educational level alone was not directly associated with anesthesia preference; however, lower educational levels were linked to reduced knowledge about spinal anesthesia.
- Most parturients obtained information about spinal anesthesia from non-medical sources, whereas physician-based counseling was limited but strongly associated with a preference for it.
- Fear of intraoperative pain was the most common concern affecting the choice of anesthesia, highlighting the need for structured prenatal education and effective preoperative counseling.

There was a statistically significant relationship between the current anesthesia modality and prior anesthesia experience (χ^2 test $P = 0.015$). A s shown in Table 3, all parturients with prior experience of both GA and SA preferred SA.

Among parturients with a previous CS delivery, 78 (42.62%) experienced postoperative complaints. The most common complaint was pain at the wound site, followed by nausea, headache, shivering, vomiting, motor deficit, and other complaints (as shown in Figure 2). The other postoperative

Table 2. Values are presented as n (%). The table demonstrates the frequencies of GA and SA preferences across different education levels, from non-literate to higher education. No statistically significant association was observed between education level and anesthesia preference(χ^2 test, $P = 0.26$).

	GA	SA
Non-literate (n(%))	17 (19.32%)	71 (80.68%)
Primary school (n(%))	23 (26.74%)	63 (73.26%)
Middle school(n(%))	10 (25%)	30 (75%)
High school (n(%))	6 (17.14%)	29 (82.86%)
Higher education (n(%))	2 (7.69%)	24 (92.31%)
χ^2 test P = 0.26		

GA, general anesthesia; SA, spinal anesthesia.

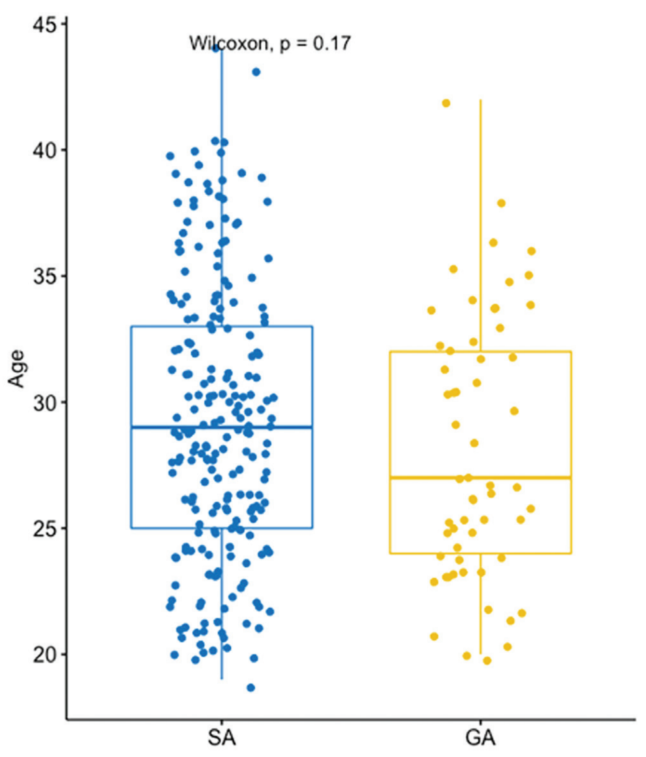

Figure 1. Boxplots illustrate the age distribution of parturients who preferred GA versus SA for their current CS delivery. Median values, interquartile ranges, and outliers are displayed. The Wilcoxon rank-sum test was used to compare groups; P values are indicated above the plots.

SA,spinal anesthesia; GA, general anesthesia.

complaints included back pain (4.37%), dyspnea (1.64%), throat ache (1.09%), treatment in the intensive care unit (0.55%), hypertension (0.55%), urinary catheter pain (0.55%), and wound infection (0.55%). When parturients were questioned about their knowledge of SA 97 (35.4%) of parturients reported that SA was "useful", 70 (25.55%) reported that it was "harmful", and 107 (39.05%) responded "don't know". When asked about the source of this information, 39.27% of parturients responded "friends, relatives", 19.27% responded "doctor", 11.27% responded "own experience" and 4% responded "internet, television".

Before performing SA, parturients who preferred this modality for CS delivery were asked about their concerns regarding the procedure. Fear of experiencing pain during operation was the principal concern expressed by 37.45% of parturients. Seeing/hearing the operation, permanent backache, fear of paralysis (which is a common misconception rather than an evidence-based concern and reported to be less than 0,01% after SA),[7] nausea were other concerns in 27.64%, 23.64%, 8% and 3.27% of parturients, respectively. In our experience with these 275 patients—both the general and SA groups— no irreversible complications were observed.

Table 3. Values are presented as n (%). The table compares anesthesia preferences in patients with no prior anesthesia experience, those with previous GA, previous SA, or both GA and SA. A statistically significant relationship was observed between prior anesthesia experience and current anesthesia choice (χ^2 test, P = 0.015).

	GA	SA
No anesthesia experience [n(%)]	14 (15.22%)	78 (84.78%)
GA [n(%)]	40 (27.78%)	104 (72.22%)
SA [n(%)]	4 (18.18%)	18 (81.82%)
GA + SA [n(%)]	0 (0%)	17 (100%)
χ^2 test P = 0.015		

GA, general anesthesia; SA, spinal anesthesia.

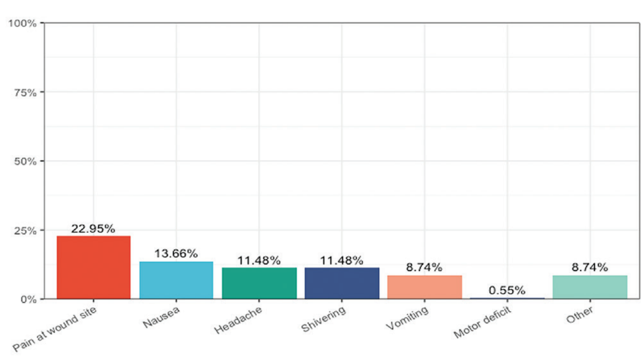

Figure 2. Bar plot showing the percentages of parturients reporting specific postoperative complaints following previous CS. The most common complaint was wound site pain, followed by nausea, headache, shivering, vomiting, motor deficit, and other complications (back pain, dyspnea, throat pain, ICU admission, hypertension, urinary catheter pain, wound infection).

CS, cesarean section; ICU, intensive care unit.

DISCUSSION

In this study, we described parturients' anesthesia preferences for CS delivery in 2019 at a tertiary care hospital. Compared with GA, RA is associated with fewer respiratory complications, superior pain control, earlier mother–newborn interaction, and shorter mobilization time; therefore, SA remains the preferred technique.[8-10] Our study aligns with other studies showing that SA is generally favored because it has minimal impact on neonatal outcomes, is associated with better postoperative recovery, and results in greater maternal satisfaction.[11-13]

Obstetric anesthesia differs from other surgical procedures due to additional concerns regarding neonatal well-being, breastfeeding, and newborn care. This process could be seriously impeded by postoperative nausea and vomiting.[14] In our cohort, wound site pain and nausea were the most frequently reported postoperative complaints. Although nausea has been cited as a potential barrier to maternal comfort and early bonding, its frequency in our study was comparable to previously reported ranges.[15] These findings suggest that concerns about postoperative discomfort may influence perception of anesthesia more strongly than the actual complication rates.

Previous experiences appear to play a guiding role for current preferences. We observed a statistically significant relationship between current anesthesia modality and prior anesthesia experience (P = 0.015), with parturients previously exposed to either GA or SA showing a preference for SA in subsequent procedures. This finding aligns with previous studies where 80% of parturients with prior SA experience reported they would choose it again for a subsequent delivery.[9] Similarly, maternal satisfaction after CS under SA has been reported as high as 97% in other studies.[16] In a 160-patient cohort study, parturients with previous SA experience opted for SA more often than the GA-experienced group.[17] On the contrary, in a systematic review Afolabi and Lesi[18] compared the neuraxial vs GA in CS delivery and more parturients in the GA group declared they would use the same technique for anensuing CS delivery. Taken together, these findings suggest that prior personal experience may outweigh abstract risk-benefit information when parturients make anesthesia decisions. Familiarity appears to function as a psychological anchor, potentially increasing perceived safety and predictability.

Although the majority of our study population had low educational attainment, no direct association was observed between education level and anesthesia preference (χ^2 test, P = 0.26). SA was favored across all educational categories. This suggests that even in populations with limited formal education, parturients tend to prefer SA if they have had a positive prior experience with it. Our results differ from those reported by Carvalho et al.[14], who identified education level as a significant determinant of anesthesia preference. However, in our cohort, lower educational status was associated with reduced knowledge regarding SA, indicating that knowledge gaps —rather than educational attainment per se— may influence uncertainty or anxiety during decision-making.[19] In this context, misinformation or an insufficient understanding of the safety profile and benefits of SA may contribute to a preference for GA despite its comparatively less favorable maternal profile.

In a prospective observational study conducted by Şahin et al.[20], both maternal and partner educational levels were found to be significantly associated with anesthesia choice for elective CS, with higher educational attainment favoring SA. In that cohort, anesthesia preference was assessed after structured preoperative counseling in the anesthesia clinic, which may have enhanced patients' understanding of anesthesia techniques, unlike in our study. This methodological difference suggests that education level alone may not directly determine anesthesia preference; rather, its effect may be mediated through access to accurate information and effective preoperative counseling. Our findings are further supported by a recent cross-sectional study from Pakistan, in which, despite a remarkably high acceptance of SA (93.7%), nearly half of the parturients reported significant fears, which were predominantly misconceptions such as paralysis, intraoperative pain, and postoperative backache. Importantly, fear was significantly more common among younger, nulliparous women with lower knowledge scores, and was frequently associated with information obtained from non-medical sources such as friends or relatives.[21] Collectively, these findings indicate that misinformation and inadequate counseling may constitute more influential barriers than formal education itself. From a clinical perspective, this underscores the importance of structured prenatal education and standardized preoperative counseling in promoting informed, patient-centered anesthesia decision-making.

A according to our study, parturients' knowledge about SA remains limited, with 39% indicating that they "don't know" enough about it. Among those who reported having knowledge, only 19% cited a doctor as the source of information, while the majority relied on information from friends and relatives. There are many studies in the literature in which parturients were referred to SA by clinicians in proper cases[22-24] and this is especially evident in obstetric-specialized anesthesiologists.[25,26] Similarly, in our study, we determined that 100% of the parturients who were informed by their doctors preferred SA. Even though Tekin et al.[23] emphasized the opposite; social environment and relatives had principal effect in the choice of anesthesia on parturients according to our findings. This condition may cause concerns that have no medical basis. Patients generally feel uncomfortable in the operating theatre. Fears of sensing pain and of seeing or hearing the operation were main concerns, and these may result in a strong inclination for GA.[15, 16, 23, 27]

Study Limitations

The main limitation of our study was the generally low levels of education among participants, which may limit the generalizability of the findings to the broader obstetric population. Our hospital does not provide prenatal classes for labor or CS delivery, and we therefore lack the opportunity to inform parturients in advance about available anesthesia options and their advantages. This study demonstrated that most parturients had insufficient knowledge regarding CS delivery and SA. Therefore, implementing prenatal classes and structured preoperative anesthesia consultations is necessary to improve maternal satisfaction and promote neonatal well-being.

CONCLUSION

Although parturients' knowledge about SA remains limited, the findings of this study suggest that structured prenatal education could enhance informed decision-making about anesthesia preferences for cesarean delivery. The observed association between prior anesthesia experience and current preference underscores the importance of providing comprehensive information on the benefits and potential risks of different anesthesia modalities. Targeted prenatal education programs that address common misconceptions—such as fear of paralysis or intraoperative pain during SA—may empower parturients to make more confident and informed choices, ultimately leading to improved maternal satisfaction and better clinical outcomes.

Ethics

Ethics Committee Approval: Ethical approval was obtained from the institutional review board of Van Training and Research Hospital (approval no: 2019/17, date: 12.09.2019), and all participants provided written informed consent in accordance with the Declaration of Helsinki.

Footnotes

Author Contributions

Concept Design – D.K.Ç.; Data Collection or Processing – D.K.Ç., H.A.S.; Analysis or Interpretation – D.K.Ç., H.A.S., N.Y.M.; Literature Review – D.K.Ç., H.A.S., N.Y.M.; Writing, Reviewing and Editing – D.K.Ç., N.Y.M.

Informed Consent: All participants provided written informed consent in accordance with the Declaration of Helsinki.

Footnotes

Declaration of Interest: The author declared no conflicts of interest.

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