AJAIC
The Anatolian Journal of Anesthesiology and Intensive Care
CLINICAL RESEARCH
e-ISSN XXXX-XXXX
DOI: 10.XXXX/XXXXX

Received: 05.09.2025
Accepted: 25.09.2025
Published: 30.09.2025

The Role of Previous Spinal Anesthesia Experience in Anesthesia Preference for Cesarean Section

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Abstract

Background: The choice of anesthesia in cesarean delivery is a crucial decision that affects maternal and neonatal outcomes. Beyond clinical indications, variables such as previous anesthetic experience, patient health literacy level, preoperative anxiety state, and the risk of adverse perioperative outcomes may significantly shape patient preferences. This study was designed to assess the impact of these factors on anesthetic modality selection among women scheduled for elective cesarean delivery.

Material and Methods: This single-center, cross-sectional survey included forty pregnant women within the eligible age range of 18–45 years who provided informed consent, all of whom had at least one previous spinal anesthesia experience. Data were collected using a structured questionnaire addressing demographic characteristics, prior anesthesia experiences, adverse effects, preoperative anxiety, and determinants of current preference. Statistical analyses employed chi-square and Fisher's exact tests, odds ratios, and effect size measures.

Results: Spinal anesthesia was chosen by 80% of participants, while 20% preferred general anesthesia. A strong association was found between prior spinal anesthesia experience and current preference ($p=0.003$, Cramer's $V=0.517$). Positive experiences strongly predicted repeated spinal preference (96%), whereas negative experiences were equally divided between spinal and general anesthesia. Adequate knowledge of spinal anesthesia was significantly associated with preference ($p=0.043$). Adverse effects were reported by 52.5% of patients, most commonly back pain (25%), nausea (20%), and vomiting (12.5%). Back pain ($p=0.015$), vomiting ($p=0.003$), and intraoperative pain ($p=0.04$) were significantly linked to avoidance of spinal anesthesia. Patients without prior side effects were nine times more likely to choose spinal anesthesia (OR=9.00; 95% CI: 0.989–81.9). Preoperative anxiety levels were also significantly associated with preference ($p=0.006$); severe anxiety increased general anesthesia preference, while low-to-moderate anxiety favored spinal anesthesia. Physician recommendation, pain control, and rapid postoperative recovery were rated as the most influential determinants.

Conclusion: Previous experiences, knowledge, adverse effects, and psychological state significantly influence anesthesia preferences in cesarean patients. Structured preoperative education, effective pain management, and strategies to minimize preventable side effects may enhance spinal anesthesia acceptance and improve maternal satisfaction.

Keywords: Anesthesia experience, Adverse effects, Cesarean section, Patient preference, Regional anesthesia

Introduction

Cesarean section is among the most frequently performed surgical procedures worldwide and is associated with notably elevated maternal morbidity and mortality risks, particularly in emergency settings. A Canadian cohort study reported that the risk of morbidity following planned cesarean delivery was nearly threefold higher than that observed after vaginal birth, with severe morbidity rates of 27.3 per 1,000 for planned cesarean sections compared to 9 per 1,000 for vaginal deliveries [1]. Postpartum infections and postoperative intensive care unit admissions were also more frequently observed following cesarean delivery. Given these elevated risks, the meticulous management of cesarean operations—including perioperative anesthetic care—is of critical importance.

Cesarean deliveries can be performed under either general anesthesia or spinal anesthesia, depending on clinical indications, patient characteristics, and perioperative considerations. The advantages of regional anesthesia include reduced postoperative analgesic requirements, fewer thromboembolic events, lower risk of gastric content aspiration, and earlier transition to oral feeding postoperatively. Additionaly compared with general anesthesia, spinal anesthesia has been associated with significantly higher neonatal Apgar scores at both the 1st and 5th minutes [2].

The choice of anesthetic technique for cesarean delivery is guided by the patient's current medical condition, the urgency of the procedure, and individual preferences. Optimal anesthesia selection requires a patient-centered approach that carefully balances clinical safety with patient expectations. Absolute contraindications, such as patient refusal of spinal anesthesia, preclude its use. Consequently, the level of knowledge that pregnant women possess regarding spinal anesthesia, as well as the quality of their prior experiences, plays a critical role in shaping their preferences and overall satisfaction. This study aims to investigate the anesthetic preferences of pregnant women who have previously undergone spinal anesthesia and to identify the factors influencing these preferences in the context of their current cesarean delivery.

Material and methods

Study Design

This cross-sectional survey was conducted at Bursa Yuksek Ihtisas Training and Research Hospital between December 10, 2024, and March 10, 2025. Ethics approval was obtained from the Medical Sciences Ethics Committee of Health Sciences University Bursa Yuksek Ihtisas Training and Research Hospital (dated 04.12.2024, decision number 2024-TBEK 2024/12-02).

Participants

A total of 40 pregnant women aged 18–45 years who had previously undergone spinal anesthesia during cesarean delivery, were literate in Turkish, and provided written informed consent were included. Participants with emergency cesarean indications, psychiatric disorders, or those unwilling to complete the questionnaire were excluded. Additionally, individuals who left 20% or more of the survey items unanswered were removed from the analysis.

Data Collection

Data were collected using a structured questionnaire developed by the researchers. The questionnaire was administered during the preoperative period after obtaining informed consent. The survey instrument contains 15 questions divided into 6 principal sections: demographic data, prior spinal anesthesia experience, side effects, anesthesia preferences, concerns about neonatal health, and psychological assessment. Validity and reliability analyses of the questionnaire were conducted using Jamovi statistical program, resulting in a Cronbach's alpha coefficient of 0.77. The factors influencing patients' preference for spinal anesthesia in cesarean section were evaluated using a 5-point Likert scale ranging from 1 (not important at all) to 5 (extremely important). Preoperative anxiety levels of participants were evaluated through self-report questionnaire measures administered prior to surgery.

Statistical Analysis

Data were analyzed using Jamovi software (version 2.6.24). Categorical data were presented as numbers

Table 1. Evaluation of Factors Affecting Anesthesia Choice

Parameters	Mean ± SD	Median (min-max)
Doctor's recommendation	4.45 ± 0.88	5.0 (2-5)
Pain-free surgery	4.13 ± 0.88	4.0 (2-5)
Fast recovery after surgery	3.92 ± 1.23	4.5 (1-5)
Fewer side effects	3.75 ± 1.13	4.0 (1-5)
Minimal anesthetic impact on the newborn	3.73 ± 1.34	4.0 (1-5)
Patient comfort during the procedure	3.27 ± 1.22	3.0 (1-5)
Safer procedure	3.00 ± 1.24	3.0 (1-5)
Fear of general anesthesia	2.98 ± 1.51	3.0 (1-5)
Factors were evaluated on a 1-5 Likert scale (1: Not at all important, 5: Very important); min: minimum; max: maximum.		

and percentages, while continuous data were presented as mean ± standard deviation. The normality of data distribution was assessed using the Shapiro-Wilk test.

Relationships between categorical variables were analyzed using the chi-square (χ^2) test. Fisher's exact test was used for cells with expected frequencies less than 5. The strength of association between two categorical variables was evaluated using phi coefficient (φ) and Cramer's V values. Odds ratios (OR) were calculated and presented with 95% confidence intervals (CI).

The importance of factors affecting anesthesia preference was assessed using a 5-point Likert scale (1=not important at all, 5=very important), and descriptive statistics (mean, median, standard deviation) were calculated. Statistical significance was set at $p<0.05$. All tests were performed two-tailed.

Results

A total of 40 pregnant women were included in the study. The mean age was 30.1 ± 4.97 years (range: 19–42), and the mean body mass index (BMI) was 31.5

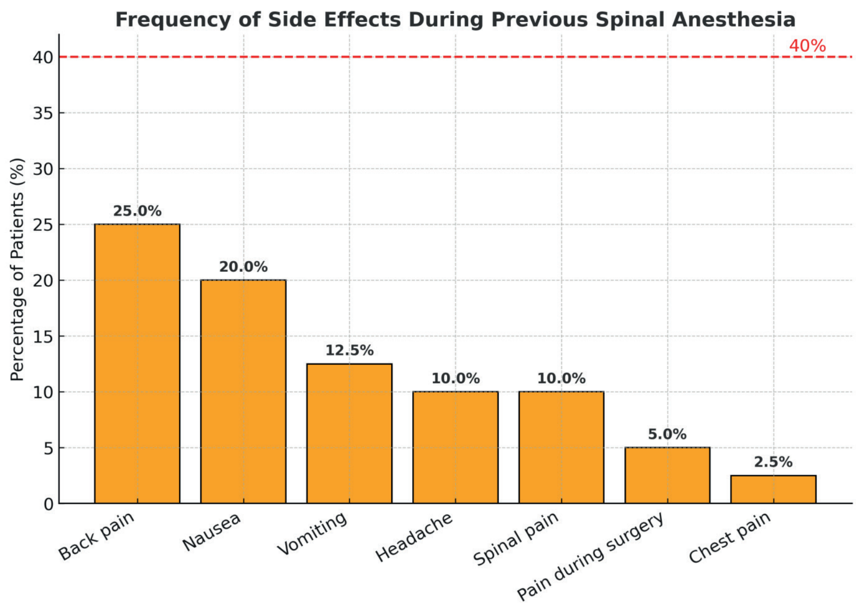

Figure 1. Distribution of Reported Adverse Effects Following Previous Spinal Anesthesia

± 4.74 kg/m². Among the participants, 42.5% (n=17) were primiparous and 57.5% (n=23) were multiparous. Regarding educational status, 62.5% (n=25) were primary school graduates, 20% (n=8) were secondary school graduates, and 17.5% (n=7) were university graduates.

Among the participants, 67.5% (n = 27) reported having adequate knowledge regarding spinal anesthesia. All women included in the study had previously undergone at least one spinal anesthesia during prior cesarean deliveries. Of these, 75% (n = 30) had experienced spinal anesthesia once, while 25% (n = 10) had undergone the procedure multiple times. For the current cesarean section, 80% (n = 32) of participants preferred spinal anesthesia, whereas 20% (n = 8) opted for general anesthesia.

Factors influencing anesthesia preference were evaluated. The highest-scoring factors were physician's recommendation (4.45 ± 0.87), pain control (4.13 ± 0.88), and rapid postoperative recovery (3.92 ± 1.23). In addition, fewer side effects (3.75), minimal impact on the newborn (3.73), patient comfort during the procedure (3.27), safety of the procedure (3.00), and fear of general anesthesia (2.98) were also found to influence preferences (Table 1).

According to the self-reported preoperative anxiety questionnaire, 32.5% (n=13) of participants reported mild anxiety, 47.5% (n=19) moderate anxiety, and 20% (n=8) severe anxiety. Overall, 67.5% of patients experienced moderate-to-severe anxiety. Furthermore, 17.5% (n=7) expressed concerns regarding the potential effects of anesthesia on the newborn.

Spinal anesthesia experiences were reported as positive by 62.5% (n=25) of the participants, neutral by 27.5% (n=11), and negative by 10% (n=4). Among those with positive experiences, 96% (n=24) stated that they would choose spinal anesthesia again, whereas only 4% (n=1) preferred general anesthesia. Of the four participants with negative experiences, half (n=2) chose spinal anesthesia and half (n=2) general anesthesia. Among those with neutral experiences, 54.5% (n=6) preferred spinal anesthesia, while 45.5% (n=5) opted for general anesthesia. A strong and statistically significant association was found between previous experience and current anesthesia preference (p=0.003). The Cramer's V value (V=0.517) demonstrated a strong relationship between these two variables. These findings indicate that the quality of past spinal anesthesia experiences is an important determinant of future anesthesia preferences.

Knowledge about spinal anesthesia was also specifically evaluated; 67.5% (n=27) reported sufficient knowledge, while 32.5% (n=13) stated insufficient knowledge. A statistically significant association was identified between the level of knowledge and anesthesia preference (p=0.043, χ^2). Among those with sufficient knowledge, 60% (n=24) preferred spinal anesthesia and 7.5% (n=3) preferred general anesthesia. In contrast, among those with insufficient knowledge, 20% (n=8) chose spinal anesthesia and 12.5% (n=5) chose general anesthesia.

Adverse effects during previous spinal anesthesia procedures were reported by 52.5% (n=21) of the participants. The most frequently reported adverse effects were back pain (25%), nausea (20%), vomiting (12.5%), headache (10%), spinal pain (10%), intraoperative pain (5%), and chest pain (2.5%) (Figure 1). Among those who experienced adverse effects, 38% reported that these influenced their anesthesia preferences, and 12.5% (n=5) stated that side effects adversely affected their postoperative recovery. Comparison of current anesthesia preferences between those with and without adverse effects revealed a statistically significant difference (p=0.046). Among the 19 participants without prior adverse effects, 94.7% (n=18) preferred spinal anesthesia and 5.3% (n=1) preferred general anesthesia. In contrast, among the 21 participants who experienced adverse effects, 66.7% (n=14) chose spinal anesthesia and 33.3% (n=7) general anesthesia. The likelihood of choosing spinal anesthesia was found to be nine times higher among patients without previous side effects compared to those with such experiences (OR=9.00; 95% CI: 0.989–81.9). The lower limit of the confidence interval (0.989) being at the threshold of statistical significance indicates a borderline significant association. The relationship between specific adverse effects and current anesthesia preference was analyzed using Fisher's exact test. Patients who experienced back pain ($p=0.015$), vomiting ($p=0.003$), and intraoperative pain ($p=0.04$) showed a statistically significant tendency to avoid spinal anesthesia. These three adverse effects were identified as the most important determinants of avoidance of spinal anesthesia preference.

A statistically significant association was also found between preoperative anxiety levels and anesthesia preference ($p=0.006$). Among patients who preferred spinal anesthesia, 34.4% (n=11) reported mild anxiety, 56.3% (n=18) moderate anxiety, and 9.4% (n=3) severe anxiety. In contrast, among those who preferred general anesthesia, 25% (n=2) reported mild anxiety, 12.5% (n=1) moderate anxiety, and 62.5% (n=5) severe anxiety.

Discussion

Caesarean section is a widely practised surgical procedure worldwide, and patient preferences play a significant role in the choice of anaesthesia method. This choice has consequences that affect both maternal and infant health. Our study investigates the impact of individual experiences, health literacy level -as well as level of knowledge about anaesthesia- preoperative anxiety levels, and previous adverse effects on anaesthesia preferences.

The most notable finding of our study is the strong association between previous spinal anesthesia experiences and current anesthesia preferences ($p = 0.003$). The fact that the majority of patients with positive experiences preferred spinal anesthesia, whereas those with negative experiences were more likely to opt for general anesthesia, demonstrates the decisive role of past experiences in future decision-making processes. This finding is consistent with the 'experience-based decision-making' model reported in the literature and emphasizes the importance of patient satisfaction in obstetric anesthesia [3].

In our study, a statistically significant association was also found between the level of knowledge regarding spinal anesthesia and the choice of anesthesia ($p = 0.043$, χ^2). This result underscores the critical role of patient education in the acceptance of anesthesia. Indeed, large multicenter studies have demonstrated that effective pain management, preoperative education, and anesthesia teams that actively involve patients in the decision-making process are key determinants of patient satisfaction [4]. Similarly, a prospective study conducted on 300 pregnant women reported that preoperative counseling significantly reduced anxiety levels and increased the rate of spinal anesthesia preference [5]. Likewise, the study by Sadeghi et al. on 84 pregnant women showed that insufficient preoperative counseling decreased patient satisfaction [6].

Another important aspect of our findings is the impact of adverse effects experienced after spinal anesthesia on anesthesia preference. In our study, 52.5% of patients reported having experienced side effects during their previous spinal anesthetics. The most frequently reported side effects were back pain (25%), nausea (20%), and vomiting (12.5%) (Figure 1). Notably, adverse effects such as back pain, vomiting, and intraoperative pain were shown to significantly increase the tendency to avoid spinal anesthesia. Similarly, a study conducted by Rhee et al. (2010) reported that postoperative nausea and vomiting as well as back pain were the main factors contributing to dissatisfaction with spinal anesthesia [7]. These findings are consistent with the results of our study. Furthermore, the fact that 12.5% of participants stated that side effects negatively affected their postoperative recovery process indicates that not only the acute phase but also long-term patient rehabilitation should be taken into account. Informing patients about these specific side effects and implementing prophylactic measures by anesthesia teams may positively influence future patient preferences.

The literature emphasizes patients' reliance on professional guidance as a key determinant of anesthesia choice, particularly in obstetric populations where heightened anxiety and uncertainty can substantially influence decision-making [8]. The findings of our study are consistent with this observation, as physician recommendation received the highest mean score among the factors influencing anesthesia choices. Beyond individual experiences and health literacy levels, the authority and guidance of healthcare professionals thus continue to represent one of the most powerful determinants in shaping anesthesia decisions for cesarean delivery.

Pain control was prioritized as the second most influential factor, underscoring the need for anesthesiologists to ensure adequate dosing and correct technique when administering spinal opioids and local anesthetics, thereby achieving effective analgesia while minimizing side effects [9]. The desire for rapid postoperative recovery emerged as the third most frequently cited determinant, largely driven by the maternal need to provide early care for the newborn and initiate breastfeeding [10]. In this context, informing patients about how postoperative recovery can be optimized through spinal anesthesia holds particular importance. Furthermore, the observation that 17.5% of participants expressed concerns regarding potential anesthetic effects on the neonate suggests that maternal anxiety extends beyond personal health considerations to encompass fetal well-being. Consistent with these findings, previous studies have likewise reported that pregnant women are concerned not only with their own anesthetic safety during the preoperative period but also with neonatal outcomes following delivery [11].

In our study, a statistically significant association was identified between preoperative anxiety levels and anesthetic preference ($p=0.006$). While elevated anxiety levels increased the preference for general anesthesia, low to moderate anxiety levels facilitated acceptance of spinal anesthesia. This finding demonstrates that patients' anesthetic preferences are influenced not only by medical factors but also by their psychological state.

Strengths and Limitations

This study has several strengths and limitations. The use of comprehensive variable analyses and validated statistical methods represents a major strength. In addition, the simultaneous evaluation of multiple factors—including prior experience, knowledge level, anxiety, and side effects—allowed for a more detailed assessment of patient-centered anesthesia preferences. However, the relatively small sample size and the single-center design are important limitations that may affect the generalizability of the findings.

Conclusion

Among patients scheduled for cesarean delivery, a previous positive experience with spinal anesthesia increases the likelihood of selecting the same technique for subsequent procedures. This underscores the importance of structured preoperative education programs, particularly prior to the initial cesarean. Because side effects such as postoperative back pain, intraoperative discomfort, and nausea are largely preventable or treatable, anesthesia teams should prioritize strategies to minimize these complications. Implementing patient-centered care in conjunction with comprehensive educational initiatives may therefore enhance acceptance of spinal anesthesia and improve overall patient satisfaction.

Ethics / Informed Consent

Ethics approval was obtained from the Medical Sciences Ethics Committee of Health Sciences University Bursa Yüksek İhtisas Training and Research Hospital (04.12.2024, No: 2024-TBEK 2024/12-02). Written informed consent was obtained from all participants.

Data Availability Statement

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

Disclosure

The authors report no conflicts of interest in this work.

Financial Disclosure

The authors confirm that no financial support was received for the conduct or preparation of this study.

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