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Original Research Article

Assessment of Patients Satisfaction and Anesthesia Related Discomfort Between Spinal Anesthesia and General Anesthesia for Cesarean Section

Faiqa Hashmi[1*], Aneeqa Zia[1], Safdar Ali Khan[1], Tanvir Hussain[1], Faisal Imran[1], Sami Ur Rehman[2]

[1]National Hospital and Medical Center, Lahore, Pakistan
[2]Doctors Hospital and Medical Center, Lahore, Pakistan
**Corresponding author`s email address:* faiqafjmc@gmail.com

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Abstract: *Cesarean section is a commonly performed obstetric procedure, and the choice of anesthesia—general or spinal—plays a crucial role in determining maternal comfort and satisfaction. Evaluating the differences in anesthesia-related discomfort and overall patient satisfaction between the two techniques is essential for optimizing perioperative care.* ***Objective:*** *To determine the frequency of general anesthesia (GA) and spinal anesthesia (SA) use in elective cesarean sections and to compare patient satisfaction and anesthesia-related discomfort between the two techniques.* ***Methods:*** *This quasi-experimental study was conducted at the Anaesthesia Department of National Hospital and Medical Centre, Lahore, Pakistan, from August 2024 to February 2025. A total of 127 women scheduled for elective cesarean section were enrolled and divided into two groups based on the planned anesthesia technique: Group A (GA) and Group B (SA). Patient satisfaction and anesthesia-related discomfort were evaluated 12 hours postoperatively using the Bauer Patient Satisfaction Questionnaire, which includes five Likert-scale questions. Data were collected at discharge and analyzed using SPSS version 25. Independent sample t-tests were used to compare mean scores, with $p < 0.05$ considered statistically significant.* ***Results:*** *Out of 127 participants, 63% underwent spinal anesthesia and 37% received general anesthesia. The mean discomfort score was significantly higher in the GA group compared to the SA group (4.26 ± 0.71 vs. 3.05 ± 0.82; p<0.001), while the mean satisfaction score was significantly lower in the GA group compared to the SA group (14.19 ± 1.58 vs. 15.26 ± 1.29; p<0.001).* ***Conclusion:*** *Spinal anesthesia was more frequently utilized and yielded significantly higher satisfaction and lower anesthesia-related discomfort compared to general anesthesia in women undergoing elective cesarean section. These findings support the preference for spinal anesthesia to enhance patient-centered outcomes in obstetric care.*

Keywords: Cesarean Section, Complications, General Anesthesia, Patient Satisfaction, Spinal Anesthesia

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Introduction

Over the past two decades, the global rate of caesarean sections (CS) has seen a substantial increase, driven by a combination of maternal preferences, obstetrician recommendations, and evolving medical indications. This trend is evident in both developed and developing countries, including Pakistan, where the cesarean delivery rate escalated from 3.2% in 1990–91 to 18.6% in 2017–18 (1). The choice of anesthetic technique for CS—either general anesthesia (GA) or regional anesthesia (RA)—plays a pivotal role in maternal and fetal outcomes, perioperative experiences, and patient satisfaction.

Regional anesthesia, encompassing spinal, epidural, or combined spinal-epidural techniques, is frequently preferred for elective cesarean deliveries due to its advantages, including the avoidance of airway instrumentation, a reduced risk of aspiration, and the ability to maintain maternal awareness during delivery (2,3). Spinal anesthesia (SA), in particular, is often selected for its rapid onset, simplicity of administration, and favorable safety profile in routine, non-emergent CS cases (4). Despite these benefits, general anesthesia remains a critical option in scenarios where regional techniques are contraindicated or not feasible, such as in instances of coagulopathy, patient refusal, or certain obstetric emergencies. GA offers benefits like controlled ventilation, airway protection, and reduced hemodynamic fluctuations in select patients (5).

Historically, a larger proportion of cesarean sections were conducted under GA, especially in emergency settings or in the absence of established RA services (6). However, with a growing emphasis on patient-centered care, enhancing the perioperative experience and reducing anesthesia-related complications has become increasingly important. Patients' subjective experiences—ranging from discomforts like nausea and drowsiness to overall satisfaction with anesthesia care—are now recognized as key indicators of healthcare quality (7). As a result, anesthesia providers are encouraged to routinely evaluate and refine clinical practices to ensure optimal outcomes and patient satisfaction (8,9).

The Bauer Patient Satisfaction Questionnaire, a validated and reliable tool (Cronbach's $\alpha = 0.84$), provides a standardized method for evaluating both anesthesia-related distress and patient satisfaction (10). While many studies have compared maternal and neonatal outcomes between GA and SA in cesarean sections, only a limited number have employed validated instruments to assess patient-reported outcomes. For instance, one study reported that 80% of patients received GA while only 20% underwent SA for CS. In that cohort, surgical site pain (greater than 70%), sleepiness (68%), and thirst (60%) were the most frequently reported discomforts. SA recipients experienced fewer side effects and reported higher satisfaction than those who received GA (6). Nevertheless, comprehensive data on patient satisfaction, particularly in the local context of Pakistan, remains scarce.

Given this gap in the literature, the present study was designed to determine the frequency of patients undergoing elective cesarean section under general and spinal anesthesia and to compare patient satisfaction and anesthesia-related discomfort between the two techniques using a validated assessment tool.

Methodology

This quasi-experimental study was conducted in the Department of Anaesthesia at the National Hospital and Medical Centre, Lahore, Pakistan, after obtaining institutional approval (Ref: NHMC/HRD/01/2039, dated January 7, 2024). The study duration spanned from August 2024 to February 2025. The study population comprised pregnant females aged 20 to 40 years, scheduled for elective Cesarean section with a gestational age of more than 37 weeks, as confirmed either by a dating scan or by the last menstrual period. Only patients classified as ASA physical status I to III were included. Patients with a history of psychiatric illness, altered mental status that could interfere with questionnaire completion, or those who experienced severe intraoperative hemorrhage (defined as blood loss >800 ml) were excluded from the study.

The required sample size was calculated to be 127 using the WHO sample size calculator, with a 95% confidence level, a 7% margin of error, and an expected proportion of 20% of patients undergoing elective Cesarean section under spinal anesthesia. A non-probability consecutive sampling technique was employed to recruit participants. Following enrollment, participants were allocated into two groups based on the anesthesia technique received: Group A (General Anesthesia) and Group B (Spinal Anesthesia). No participants were lost to follow-up, and all completed the planned intervention and assessments. Final data analysis included 47 participants in Group A and 80 participants in Group B.

Demographic and clinical variables were collected for all patients, including age, gestational age, parity, gravida, and ASA status. The primary outcomes were anesthesia-related discomfort and patient satisfaction, both assessed 12 hours post-operatively using the pre-validated Bauer Patient Satisfaction Questionnaire, which demonstrated strong internal consistency (Cronbach's $\alpha = 0.84$). The questionnaire was administered by the principal investigator at the time of patient discharge. Discomfort assessment included evaluation of symptoms such as drowsiness, surgical site pain, thirst, hoarseness, sore throat, nausea or vomiting, chills, confusion, injection site pain, and shivering. Each symptom was scored by severity as "None," "Moderate," or "Severe." An overall discomfort score was calculated, and a demarcation threshold formula was used to categorize patients into those with and without discomfort. The cut-off score was derived as the average of the maximum (10) and minimum (0) possible scores, yielding a cut-off value of 5. Patients scoring above 5 were classified as having experienced discomfort.

Patient satisfaction was evaluated using five Likert-scale items, with responses ranging from "very satisfied" to "very dissatisfied." Total satisfaction scores ranged from 4 to 20. A score above 12 indicated satisfaction, whereas a score below 12 indicated dissatisfaction with anesthesia care.

Data were analyzed using SPSS version 25. Quantitative variables, such as age, gestational age, parity, and gravida, were reported as means with standard deviations. Qualitative variables, including ASA status, type of anesthesia, discomfort, and satisfaction, were summarized using frequencies and percentages. The Chi-square test was employed to compare categorical variables between the two anesthesia groups. To control for potential confounding variables such as age, gestational age, and ASA status, stratification was performed, and post-stratification Chi-square tests were applied to assess the effect of these modifiers on patient satisfaction. A p-value less than 0.05 was considered statistically significant.

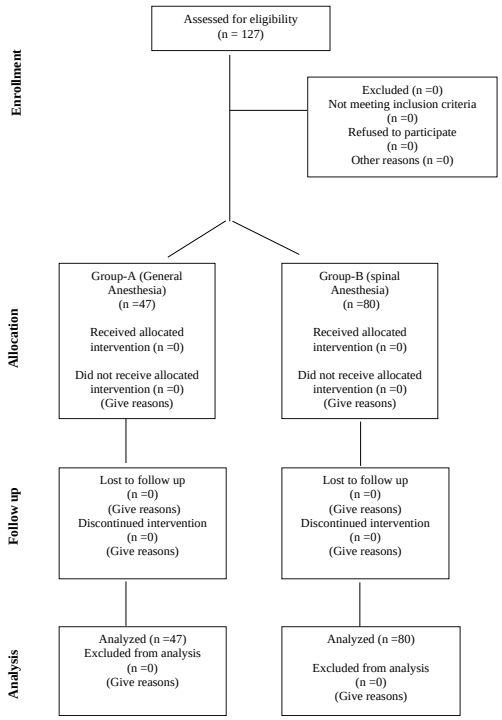

Figure 1: Patient Flow Diagram

Results

A total of 127 women were enrolled, with 47 (37%) receiving general anesthesia (Group A) and 80 (63%) spinal anesthesia (Group B). No participants were lost to follow-up. The baseline characteristics, including age, gestational age, duration of surgery, ASA status, gravida, and parity, showed no statistically significant differences between the two groups (Table 1). Anesthesia-related discomfort was significantly higher in Group A compared to Group B (mean score 4.26±2.05 vs. 3.05±1.27;

p<0.001). The proportion of patients experiencing no discomfort (<5 score) was also significantly higher in Group B (92.5%) compared to Group A (61.7%) (p < 0.001). Mean satisfaction scores were significantly higher in the spinal group (15.26±1.90) compared to the general anesthesia group (14.19±1.09) (p<0.001), though the overall satisfaction rate (>12 score) was comparable between the groups (92.5% vs. 91.5%; p=0.838) (Table 1).

Discomfort components such as drowsiness, hoarseness, sore throat, confusion, and injection site pain were significantly more frequent in the general anesthesia group, while nausea/vomiting, shivering, and feeling cold were more prevalent in the spinal group (Table 2).

In terms of satisfaction (Table 3), patients receiving spinal anesthesia reported significantly higher satisfaction in areas such as preoperative information, waking from anesthesia, and postoperative pain management (p < 0.001). Satisfaction with the management of nausea and vomiting, as well as overall departmental care, showed no significant differences between groups.

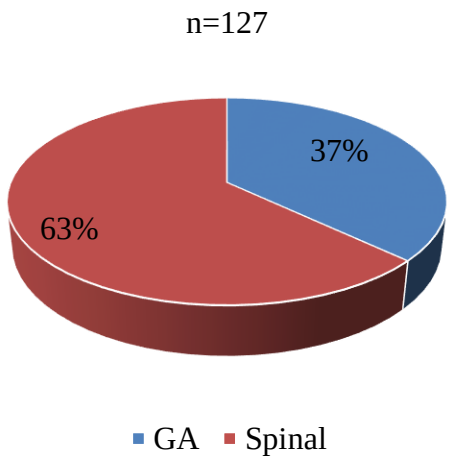

Figure 2: Frequency of patients undergoing elective cesarean section under general and spinal anesthesia (n=127)

Table 1: Comparison of the frequency distribution of different variables between groups (n=127)

	Group-A	**Group-B**	**p-value**
	General Anesthesia	**Spinal Anesthesia**	
	47(37%)	**80(67%)**	
Age (Years)	29.23±2.64	29.02±4.43	0.793
Gestational Age (Weeks)	37.77±0.84	37.86±0.84	0.532
Duration of surgery (Minutes)	69.74±10.93	72.58±12.42	0.198
ASA Status			
ASA-II	35(74.5%)	70(87.5%)	0.061
ASA-III	12(25.5%)	10(12.5%)	
Gravida			
1	12(25.5%)	23(28.7%)	0.087
2	11(23.4%)	11(13.8%)	
3	12(25.5%)	35(43.8%)	
≥4	12(25.5%)	11(13.8%)	
Parity			
0	12(25.5%)	23(28.7%)	0.099
1	11(23.4%)	11(13.8%)	
2	12(25.5%)	35(43.8%)	
3	4(8.5%)	6(7.5%)	
4	8(17%)	5(6.3%)	
Anesthesia-Related Discomfort			
No discomfort: <5	29(61.7%)	74(92.5%)	<0.001
Discomfort: ≥5	18(38.3%)	6(7.5%)	
Score (Mean±SD)	4.26±2.05	3.05±1.27	<0.001
Satisfaction Score			
Satisfied: ≥12	43(91.5%)	74(92.5%)	0.838
Not Satisfied: <12	4(8.5%)	6(7.5%)	
Score (Mean±SD)	14.19±1.09	15.26±1.90	<0.001

Note: (c) Chi square test, (t): Independent sample t-test

Table 2: Comparison of anesthesia-related discomfort reported by patients about type of anesthesia (n=127)

		Group-A General (n=47)		Group-B Spinal (n=80)		p-value
		n	%	n	%	
Drowsiness	Yes	35	74.5%	22	27.5%	<0.001*
	No	12	25.5%	58	72.5%	
Pain at the site of surgery	Yes	35	74.5%	44	55.0%	0.029*
	No	12	25.5%	36	45.0%	
Thirst	Yes	35	74.5%	45	56.3%	0.056
	No	12	25.5%	35	43.8%	
Hoarseness	Yes	23	48.9%	9	11.3%	<0.001*
	No	24	51.1%	71	88.8%	
Sore throat	Yes	35	74.5%	5	6.3%	<0.001*
	No	12	25.5%	75	93.8%	
Nausea or vomiting	Yes	4	8.5%	27	33.8%	0.001*
	No	43	91.5%	53	66.3%	
Feeling cold	Yes	7	14.9%	30	37.5%	0.007*
	No	40	85.1%	50	62.5%	
Contusion or disorientation	Yes	9	19.1%	5	6.3%	0.025*
	No	38	80.9%	75	93.8%	
Pain at the site of the Anesthetic injection	Yes	3	6.4%	18	22.5%	0.018*
	No	44	93.6%	62	77.5%	
Shivering	Yes	14	29.8%	39	48.8%	0.036*
	No	33	70.2%	41	51.2%	

Note: (c) Chi square test, (*) p-value <0.05

Table 3: Comparison of satisfaction with anesthesia care about type of anesthesia (n=127)

	Group-A GA (n=47)		Group-B Spinal (n=80)		p-value
	n	%	n	%	
How satisfied were you with the information provided by the anesthetist before the operation?					
Dissatisfied	15	31.9%	27	33.8%	<0.001*
Satisfied	32	68.1%	30	37.5%	
Very Satisfied	0	0.0%	23	28.7%	
How satisfied were you waking up from anesthesia?					
Dissatisfied	24	51.1%	15	18.8%	<0.001*
Satisfied	23	48.9%	53	66.3%	
Very Satisfied	0	0.0%	12	15.0%	
How satisfied have you been with pain therapy after surgery?					
Dissatisfied	3	6.4%	13	16.3%	<0.001*
Satisfied	44	93.6%	43	53.8%	
Very Satisfied	0	0.0%	24	30.0%	
How satisfied were you with the treatment of nausea and vomiting after the operation?					
Dissatisfied	3	6.4%	5	6.3%	0.111
Satisfied	41	87.2%	59	73.8%	
Very Satisfied	3	6.4%	16	20.0%	
How satisfied were you with the care provided by the department of anesthesia in general?					
Dissatisfied	3	6.4%	5	6.3%	-
Satisfied	37	78.7%	63	78.8%	
Very Satisfied	7	14.9%	12	15.0%	

Note: (c) Chi square test, (*) p-value <0.05

Discussion

In the present study, 63% of women underwent spinal anesthesia while 37% received general anesthesia for elective cesarean section. This distribution aligns with global trends favoring spinal anesthesia (SA) due to its favorable safety profile, efficacy in pain control, and lower incidence of maternal morbidity. Multiple studies have corroborated the predominance of SA in cesarean sections, emphasizing its clinical effectiveness and maternal preference in non-emergency settings (11,12). However, the frequency of general anesthesia (GA) varies significantly across regions and healthcare settings. For example, Basnet et al. reported a GA rate of only 2.98%, typically limited to emergencies or contraindications for SA (13). Conversely, Novakovic et al. reported a strikingly different trend, with 80% of cesarean deliveries performed

under GA and only 20% under SA, suggesting that institutional protocols and clinician preferences heavily influence anesthetic choices (6).

In our study, anesthesia-related discomfort was significantly higher in patients who underwent GA compared to SA, with a corresponding decrease in satisfaction scores ($p<0.001$). These findings are consistent with previous literature, which indicates a better overall patient experience with spinal anesthesia. A multicenter study demonstrated satisfaction levels exceeding 90% for SA, attributing the higher scores to reduced incidence of side effects and improved postoperative experiences (6). Similarly, another study reported that 80.2% of patients expressed satisfaction with SA, though dissatisfaction was often linked to inadequate preoperative communication (14). Even when postoperative pain scores were similar between groups, satisfaction tended to be higher among SA recipients, suggesting that the overall perioperative experience—not just pain relief—plays a critical role in patient perception (15).

Although our study did not evaluate neonatal outcomes, existing evidence suggests a neonatal benefit associated with SA. For instance, one study found that 70.27% of neonates delivered under SA had Apgar scores of 9 at one minute compared to only 20.29% in the GA group. Moreover, the likelihood of an Apgar score below 7 was significantly higher among neonates exposed to GA, with a reported risk ratio of 4.81 (16,17). These findings further support the preference for SA in elective procedures when clinically feasible.

Despite general trends favoring SA, not all studies report superior satisfaction with spinal anesthesia. One study observed that 95% of patients who received GA were satisfied compared to 78.3% for SA (18). Factors influencing these outcomes included previous anesthetic experiences, expectations, and the quality of postoperative care, particularly pain management (14). Additionally, while many women may prefer SA, psychological barriers such as fear and anxiety persist. In one study, although 93.7% of pregnant women consented to SA at a median gestational age of 37 weeks, a substantial proportion expressed anxiety about the technique, highlighting the need for effective preoperative counseling and education (19). Furthermore, a local study, emphasized that GA continues to play a critical role in emergency obstetric care, where rapid maternal and fetal stabilization is paramount (20).

One limitation of this study is the lack of a comparative analysis of fetal outcomes between general and spinal anesthesia. This comparison could enhance our understanding of how different types of anesthesia affect neonatal health. Additionally, the study did not assess the impact of patient education on anesthesia choices and satisfaction, which is vital for alleviating fears and improving the overall patient experience. Future research should aim to include a more diverse population and evaluate both maternal and fetal outcomes. Furthermore, it should consider the role of patient education in the decision-making process and overall satisfaction.

Conclusion

The results of this study indicate that 63% of women received spinal anesthesia for their cesarean sections, while 37% underwent general anesthesia. The findings reveal that spinal anesthesia is associated with higher satisfaction rates and lower levels of anesthesia-related discomfort compared to general anesthesia for cesarean deliveries. These results underscore the importance of patient education and individualized anesthesia approaches in enhancing maternal satisfaction and outcomes.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC- NHMC/HRD/01/2039)

Consent for publication

Approved

Funding

Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

FH
Manuscript drafting, Study Design,
AZ
Review of Literature, Data entry, Data analysis, and drafting articles.
SAK
Conception of Study, Development of Research Methodology Design,
TH
Study Design, manuscript review, critical input.
FI
Manuscript drafting, Study Design,
SUR
Conception of Study, Development of Research Methodology Design,

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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