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Comparison Of General Versus Spinal Anesthesia For Elective Cesarean Section At Northwest General Hospital Peshawar

Dr. Usman Jan[1], Dr. Laraib Amin[2], Dr. Ajmal Khan[3], Dr. Hafsa Durrani[4], Dr. Ahmad Reshad Payenda[5], Dr. Wasim Khan[6], Dr. Inam Ullah[7], Dr. Faizan Ahmed[8]

Abstract:

Background: *Physiological changes in pregnancy might lead to cesarean section which can be performed through general or spinal anesthesia having different pros and cons and choice of anesthesia might vary depending on the patient's choice.*
Methods: *A study at Northwest General Hospital (2022-2023) compared spinal anesthesia (SA) and general anesthesia (GA) for planned C-sections. They excluded high-risk cases and those with missing data. The study looked at surgery duration, baby's health at birth, blood loss, mom's recovery time, baby needing intensive care, and mom's satisfaction with the anesthesia method.*
Results: *A study at Northwest General Hospital (2[1]022-2023) compared spinal anesthesia (SA) and general anesthesia (GA) for planned C-sections. Out of 195 elective C-sections, spinal anesthesia was used in 115 cases (59%) and general anesthesia in 80 (41%). There were no major complications or deaths. The study found that while spinal anesthesia resulted in slightly higher blood loss compared to general anesthesia, there were no significant differences in baby's health at birth (APGAR score), surgery duration, length of hospital stay, or needing the baby to be in intensive care. Importantly, patients who received spinal anesthesia reported significantly higher satisfaction and were more likely to recommend it to others.*
Conclusion: *Regarding the length of hospital stay, APGAR score at one minute, and admission to neonatal critical care, there was no statistically significant difference between the two kinds of anesthesia. For GA, the estimated blood loss was lower. In comparison, patients were happier with spinal anesthesia.*

Keywords: *General anesthesia, spinal anesthesia, elective cesarean section.*

Introduction:

Pregnancy-related physiological changes, such as those related to the heart, blood vessels, and respiratory system, raise the risk of cesarean sections (CS), and parturient anesthesia management presents difficulties since it requires simultaneous care for the mother and the

[1,3,4]Post Graduate Resident of Anesthesia, Northwest General Hospital and Research Center, Peshawar.
[2]House Officer General Surgery, Northwest General Hospital and Research Center, Peshawar.
[5]Post Graduate Resident of Neurosurgery, Northwest General Hospital and Research Center, Peshawar.
[6]Post Graduate Resident of Orthopedic Surgery, Northwest General Hospital and Research .Center, Peshawar.
[7]Post Graduate Resident of Orthopedic Surgery, Khyber Teaching Hospital, Peshawar.
[8]Registrar, Cardiology Department, Peshawar General Hospital, Peshawar.
Corresponding Author: Dr Laraib Amin
House Officer General Surgery, Northwest General Hospital and Research Center, Peshawar

unborn child (**1-4).** These dangers and difficulties are correlated with the urgency **(5)**. Most anesthetists who use general anesthesia (GA) in obstetrics have relatively little clinical experience. Due to the time factor determined by the fetal state, which typically prevents regional anesthetic, GA is mostly performed during emergency cesarean sections (**6)**. Spinal anesthesia (SA) has a less than 1% failure rate and a quick onset of action, offering dependable surgical anesthesia from the mid-thoracic level to the sacrum.

Furthermore, it was shown that SA offered simpler, elective cesarean sections with superior and more affordable anesthesia than Epidural Anesthesia (**7,8)**. The most common causes of death following cesarean sections, which are commonly performed, are complications related to preeclampsia, pulmonary thromboembolism, amniotic fluid embolism, obstetric hemorrhage, and heart illness. The risk of maternal mortality following cesarean sections is significantly greater than that of vaginal deliveries (**9)**.
The purpose of this study was to look at how different feto-maternal outcomes were impacted by the type of anesthetic used. The selection of anesthetic for cesarean delivery warrants extensive research since it affects the post-operative course, mother and fetal outcomes, and both.

Methodology:
A retrospective study regarding comparison of GA vs SA for elective Cesarian Section was carried out at Northwest General Hospital Peshawar from August 2022 till December 2023. Multiple pregnancies, known medical conditions, cesarean hysterectomy patients, and patients with any missing clinical data were excluded.
The length of the CS, APGAR Score at one minute, estimated blood loss (EBL), length of postoperative hospital stay (LOS), admission to the neonatal intensive care unit (NICU) and overall patient satisfaction and recommendation were all taken into consideration when comparing the two types of anesthesia.
Only elective cesareans were included. Any cesarean performed voluntarily in conjunction with a previously scheduled admission and surgery was referred to as an **elective cesarean**. This definition covered maternal desire in addition to fetal and maternal indications.
In our institution, the EBL (mL) was consistently and uniformly recorded for every procedure. This included how many surgical pads were used, how much blood was in the suction jar, and whether there was any free blood or clots on the surgical towels, on the operating field floor, or elsewhere. The final EBL would normally be agreed upon by the chief surgeon, the assistant surgeon(s), the anesthetist(s), and the theatre nursing staff.
The attending neonatal staff, who attended every cesarean surgery in accordance with hospital practice, regularly recorded the APGAR score.
The number of days, excluding the day of surgery, spent in the hospital as a result of the mother's surgical indication—and not as a result of her medical, social, or economic circumstances or a neonatal indication—was used to calculate the duration of post-operative hospitalization, expressed in days. This was due to the fact that some mothers would keep their newborns overnight in the hospital if they were admitted for observation or for any other reason.
Subjectively, the women's overall happiness with the anesthetic mode was gauged by asking if they would suggest the same mode to a friend and by answering yes or no. It was completed upon discharge, when the patients had recovered enough to consider their entire cesarean experience. Medical files—both paper and electronic—as well as admission, clinic, operational, neonatal, and, if necessary, patient phone conversations were used to gather this data. SPSS 25 was used to analyze the data.

Since we were comparing two distinct forms of anesthesia, we calculated the frequency and

percentage of the categorical data and used the ANOVA test and chi squared analysis as necessary to examine it.
The retrospective nature of the study led the IRB committee to conclude that a formal informed consent was not required. However, as the data were anonymized and confidentiality was upheld, we were able to ensure that the participants' privacy had been respected.

Results:
There were total 340 cesarean sections performed during the said study period. Among these, 195 were selected for study as these were elective operations. There was no major complication or infant/maternal death.
Among these elective cesarean sections, 115 (59%) were performed under spinal while 80 under general anesthesia (41%).
There was no significant difference in maternal age of the two anesthesia types. (Table 1)

Table 1: **GA and SA comparison for variables in elective CS regarding fetus and mother.**

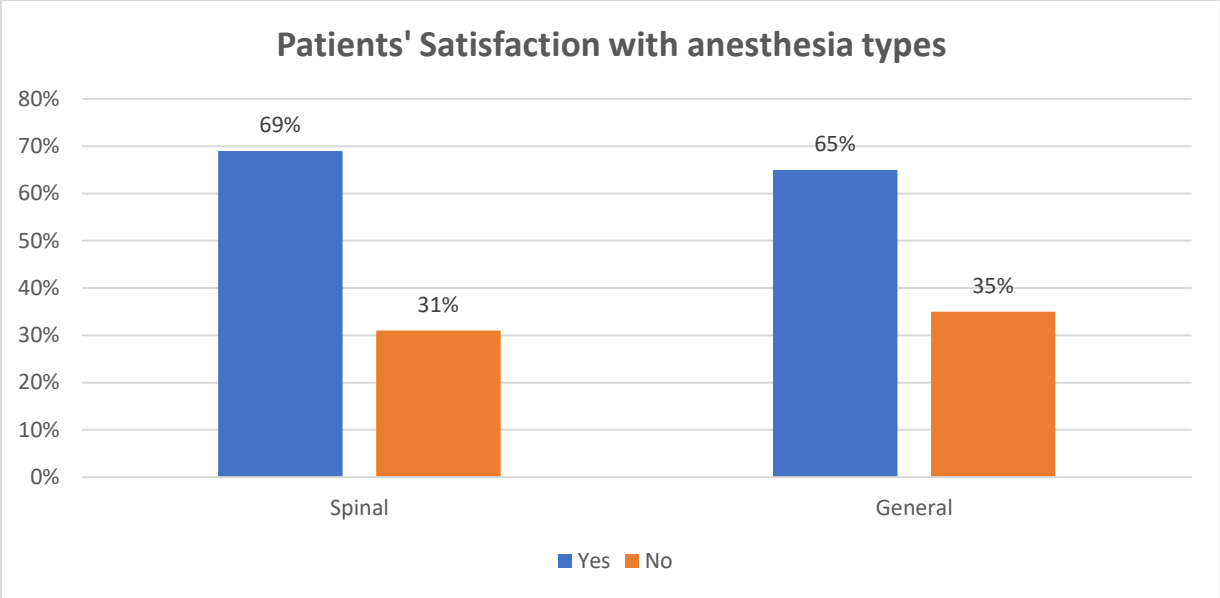
Variable	**Spinal anesthesia**	**General anesthesia**	**P value**
	n=115	**n=80**	
Age in years +-SD	32 +- 5.2	32.8 +- 4.6	0.482
Hospital stay in days	4.1 +- 1.8	4.5 +- 2.2	0.591
Duration of surgery in minutes	53 +- 10	55 +- 13	0.130
Estimated Blood loss in mL	750 +- 240	710 +- 180	0.002
Apgar score (1 minute)	7.8 +-0.75	7.8 +- 0.86	0.039
NICU admission. **Yes** **No**	 42 (37%) 73 (63%)	 38 (48%) 42 (52%)	0.000

There was a significant difference in the category of elective cesarean sections reporting higher EBL under SA as compared to GA (P = 0.002).
The APGAR score at 1 minute after SA was 7.8+-0.75 while 7.8+-0.86 for GA. It was not statistically significant though (P=0.039).
Between the anesthetic types, there was no statistically significant difference in LOS, operation time, or NICU admission.

Table 2: Satisfaction of patients regarding mode of anesthesia.

Anesthesia type	**Satisfied**	**Not satisfied.**
Spinal, n	80 (69%)	35 (31%)
General, n	52 (65%)	28 (35%)

We questioned the patients over the phone to find out how happy they were with the anesthesia they had and if they would suggest it to a friend. Statistically significant differences were observed in patient satisfaction between spinal and general anesthesia (P = 0.000). More patients recommended spinal anesthesia as they had good experience with it.



Discussion:

We conducted separate comparisons of the various anesthetic varieties within each category. Additionally, the findings demonstrate that there was no discernible difference in the women's ages across all categories.

This study used a single estimation technique for all cesarean sections rather than relying on complex method(s) for EBL. Rubenstein et al. (**10)** discovered that a novel colorimetric device was a more accurate predictor of post-operative hemoglobin in women with high EBL. The idea that EBL or quantitative evaluation of blood loss methodologies adequately reflect the actual blood loss after scheduled cesarean section was rejected by other authors (**11)** as well.

According to our research, the SA had a greater EBL than the GA did. On the other hand, GA was linked to a higher risk of surgical blood loss than SA in low-risk patients undergoing elective CS, according to prospective research by Aksoy et al. (**12)**. These authors made comparisons using hematocrit, preoperative hemoglobin, and postoperative hemoglobin. The averages for spinal and general anesthesia in our study were 750 +/- 240 and 710 +/- 180, respectively. The difference in EBL was quite small and might not have been reflected in a substantial change in hemoglobin. The mean difference was only 40 milliliters.

The three distinct forms of anesthetic used in the elective CS did not significantly differ in terms of APGAR scores at either the one-minute or five-minute mark. For this reason, there was no statistically significant difference between spinal and general anesthesia in terms of NICU admission.

Dyer et al. (**13)** confirmed that in patients with non-reassuring fetal cardiac tracing and preeclampsia, 1-min Apgar scores were lower after GA than after SA. Additionally, they discovered no differences in the proportion of patients requiring resuscitation or having umbilical arterial pH levels below 7.2 or Apgar scores of less than 7 at 1 or 5 minutes. We found no statistically significant difference in NICU admission between the two kinds of anesthesia in our study. Our research showed that spinal and general anesthesia have comparable clinical neonatal safety profiles.

For the two forms of anesthetic used in the elective CS, there was no discernible difference in the length of stay in the hospital or the duration of the procedure. No statistical evidence was discovered by Edipoglu et al. (**14)** to support the superiority of any anesthetic approach in terms of newborn morbidity. According to Tafish et al. (**15)**, there was no difference between GA

and SA in terms of LOS, operating time, or the amount of time needed to require analgesia. They found that the safety profiles of GA and SA were comparable.

In a retrospective review, Ikeda et al. (**16)** discovered a trend since 2015 toward a decrease in obstetric GA. According to our research, GA was used for 41% of all elective cesarean sections. Patients in our study reported greater satisfaction with spinal anesthesia than with general anesthesia. The reason for this could be that the patient is conscious, not worried about GA problems, and has the opportunity to see the child right after surgery. In addition, our hospital has a high-quality neonatal intensive care unit next to the birth area. The baby is sent there for improved treatment until they are completely risk-free and is not handed to caregivers directly. The patient's happiness that she is aware of her child's status in the neonatal intensive care unit may stem from this. Chen et al. (**17)** discovered that the GA group had considerably higher post-operative patient satisfaction than the SA group. Nonetheless, Ghaffari et al. (**18)** discovered that SA, as opposed to GA, was the preferred approach for cesarean sections because, among other advantages, it offered new moms efficient pain management, mobility, a quick return to their regular activities, and an improvement in their quality of life. 68% of participants in a prospective study of women who had SA-assisted cesarean sections said they were happy with the way their pain was managed (**19).** Similar findings were seen in our study, which found that 69% of patients were happy with spinal anesthetic.

Due to its retrospective design and potential confounding variables including the anesthetists' and obstetricians' experiences and related maternal morbidity factors, our study was limited. For a variety of reasons, we also did not include emergency cesarean sections, therefore our results are limited to elective cesarean sections exclusively. To remove complicating variables causing varying bias, we advise conducting comprehensive follow-up research that considers patients' satisfaction with the anesthetic approach using standardized objective assessment techniques.

Conclusion:

There was no statistically significant difference among the two types of anesthesia regarding neonatal intensive care admission, APGAR score at 1 minute and length of hospital stay. Estimated blood loss was less for GA. Patients' satisfaction was more for spinal anesthesia comparatively.

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