ISSN Online: 3007-1941 ISSN Print: 3007-1933 https://msra.online/index.php/Journal/about

Multidisciplinary Surgical Research Annals
https://msra.online/index.php/Journal/about
Volume 3, Issue 3 (2025)

Comparison of Complication in High-Risk Obstetric Patients General and Spinal Anesthesia

[1]Awais Ahmad Khaliq*, [2]Mudassir Rasheed, [2]Muhammad Sohaib, [2]Muhammad Huzaifa, [2]Mafia, [2]Marry, [3]Nasir Ali, [3]Abu Usama

Article Details

Keywords: Problems, spinal anesthesia, general anesthesia, high-risk obstetric patients, and cesarean birth.

Awais Ahmad Khaliq*
Lecturer, Department of Emerging Allied Health Technology, Faculty of Allied Health Sciences, Superior University, Lahore.
Mudassir Rasheed
Student of BS Anesthesia Technology, Department of Emerging Allied Health Technology, FAHS, Superior University Lahore.
Muhammad Sohaib
Student of BS Anesthesia Technology, Department of Emerging Allied Health Technology, FAHS, Superior University Lahore.
Muhammad Huzaifa
Student of BS Anesthesia Technology, Department of Emerging Allied Health Technology, FAHS, Superior University Lahore.
Mafia
Student of BS Anesthesia Technology, Department of Emerging Allied Health Technology, FAHS, Superior University Lahore.
Marry
Student of BS Anesthesia Technology, Department of Emerging Allied Health Technology, FAHS, Superior University Lahore
Nasir Ali
Anesthesia Technologist, District Headquater Hospital, Okara, Pakistan.
Abu Usama
Anesthesia Technologist, District Headquater Hospital, Okara, Pakistan.

ABSTRACT

High-risk obstetric patients undergoing cesarean births or other surgical operations require careful anesthetic treatment to minimize complications. General anesthesia (GA) and spinal anesthesia (SA) are two common anesthetic techniques used in obstetrics. However, the anesthetic technique employed can have a significant impact on the outcomes for the mother and the fetus. Examining the hazards of GA and SA issues in high-risk obstetric patients undergoing cesarean births was the primary objective of this study. Analyzing how the anesthetic technique affected maternal hemodynamics, fetal outcomes, and postoperative recovery was secondary. This prospective observational study comprised two hundred high-risk obstetric patients receiving cesarean birth under GA or SA. Patients were matched based on clinical and demographic characteristics. The anesthetic approach was chosen based on the patient's and the anesthesiologist's choices. Complications that were observed and compared between groups included postoperative nausea and vomiting, fetal discomfort, and maternal hypotension. Maternal hypotension was much more common in the SA group (35% vs. 15%, $p < 0.01$). However, the GA group had fetal discomfort more frequently (20% vs. 10%, $p < 0.05$). Postoperative nausea and vomiting were more common in the GA group (40% vs. 20%, $p < 0.01$). There were no appreciable differences in postoperative recovery or maternal hemodynamics between the group. This study suggests that both GA and SA may have a distinct set of effects on high-risk obstetric patients. While SA is associated with a higher frequency of maternal hypotension, GA is associated with a higher incidence of fetal discomfort as well as postoperative nausea and vomiting. These findings highlight the importance of careful anesthetic administration and individualized patient care for high-risk obstetric patients.

INTRODUCTION:

In tertiary care centers, a significant proportion of pregnancies ranging from 30 to 40 percent are classified as "high risk" due to various obstetric and medical conditions that can adversely affect both maternal and fetal outcomes. Key high-risk obstetric issues include pre-eclampsia, diabetes mellitus, breech presentation, and premature labor. Each of these conditions necessitates close monitoring and management to enhance maternal and perinatal outcomes. For instance, pre-eclampsia can lead to severe complications such as eclampsia and placental abruption, while diabetes can result in macrosomia and an increased likelihood of cesarean delivery. Addressing these high-risk factors is crucial for optimizing care during pregnancy and delivery (1,2).

Anesthesia management in high-risk obstetric patients presents unique challenges, particularly in the context of cesarean deliveries. The choice of anesthetic technique whether general anesthesia (GA) or spinal anesthesia (SA) can significantly impact maternal and fetal outcomes. While GA is often preferred in emergency situations due to its rapid airway control, SA is associated with better pain relief and fewer complications for both mother and child. However, high-risk patients may experience increased morbidity and mortality rates related to anesthesia, necessitating careful evaluation and tailored management strategies (3,4).

Recent advancements in regional anesthesia techniques, such as combined spinal-epidural (CSE) anesthesia, have improved pain control and reduced opioid requirements during labor. These innovations, along with the application of supraglottic airway devices in cesarean sections, enhance airway management and minimize complications. Nevertheless, the optimal anesthetic technique for high-risk obstetric patients remains unclear, highlighting the need for further research to compare the risks and benefits of GA and SA in this population (5).

Anesthesia management in high-risk obstetric patients presents unique challenges, particularly in the context of cesarean deliveries. The choice of anesthetic technique whether general anesthesia (GA) or spinal anesthesia (SA) can significantly impact maternal and fetal outcomes. While GA is often preferred in emergency situations due to its rapid airway control, SA is associated with better pain relief and fewer complications for both mother and child. However, high-risk patients may experience increased morbidity and mortality rates related to anesthesia, necessitating careful evaluation and tailored management strategies (6).

The increasing prevalence of cardiovascular risk factors among women of childbearing age further complicates the landscape of high-risk obstetric care. As more women with a history of congenital heart disease reach childbearing age, the intersection of these medical conditions with pregnancy presents unique challenges. The combination of improved survival rates for children with congenital heart disease and the rising rates of obesity, hypertension, and diabetes among pregnant women necessitates a comprehensive approach to maternal and fetal health. This evolving demographic underscores the importance of specialized care and monitoring for high-risk obstetric patients (7).

Moreover, advancements in regional anesthesia techniques, such as combined spinal-epidural (CSE) anesthesia and continuous spinal anesthesia, have revolutionized pain management during labor and delivery. These innovations not only enhance pain control but also reduce the reliance on opioids, which can have adverse effects on both mother and fetus. The application of supraglottic airway devices during cesarean sections further improves airway management, particularly in patients with difficult airways. As the field of obstetric anesthesia continues to evolve, understanding the implications of these advancements on maternal and neonatal outcomes remains a critical area of research (8,9).

A review of emergency obstetric care (EmOC) training from 1997 to 2017 revealed that such training significantly enhances healthcare providers' skills, knowledge, and confidence in managing obstetric emergencies. Programs incorporating EmOC training have been linked to improved access to services and a reduction in maternal and neonatal mortality rates. This evidence underscores the importance of integrating EmOC training into maternal health programs to enhance the quality of care (10).

In the realm of pain management during labor, a comparative review of analgesia administration schemes highlights the necessity of individualized approaches. While epidural analgesia is considered the gold standard, non-pharmacological options can also provide effective pain relief with fewer side effects. Ongoing research is essential to refine these options and optimize outcomes for both mothers and infants (11).

The findings from the literature suggest that effective training and individualized pain management strategies can lead to improved maternal satisfaction and better health outcomes. By enhancing healthcare providers' skills through EmOC training, the quality of care during high-risk pregnancies can be significantly improved. Additionally, optimizing pain management during labor not only enhances maternal satisfaction but also contributes to better neonatal outcomes (12).

In conclusion, addressing the complexities of high-risk obstetric care through targeted training and individualized anesthetic techniques is essential for improving maternal and fetal outcomes. The ongoing research into the comparative risks and benefits of different anesthetic methods will provide valuable insights that can guide clinical practice and enhance the safety and effectiveness of care for high-risk obstetric patients.

MATERIAL AND METHODS

Research Design: Descriptive cross sectional study design was used.

Clinical Settings: Date was collected from RuKsana Begum memorial and Mayo Hospital.

Sample Size: Total of sample size of the patients with intraoperative complication of Obstetric patients under general anesthesia, spinal anesthesia was conducted from Dr. Talat and Ganga Raam Hospital Lahore. To calculate sample size from population Cochran’s Formula is used n=Z2pq/e2 (14).

Sampling Method: To guarantee a representative and varied sample of patients, random sampling was used.

Study Duration: The study was conducted in 5-6 months.

Selection Criteria:
Inclusion criteria: Adult individuals over 40 to 50, particularly those who have been exposed to (smoking).

Exclusion criteria: Patients with Obstetrics who suffer from severe comorbidities (e.g., cardiac, liver, or renal disease), other respiratory conditions (e.g., asthma or tuberculosis), active cancer, recent surgeries or hospitalizations, recent severe exacerbations, mental health issues, substance abuse, poor compliance, pregnancy, or use of contraindicated medications are usually excluded from clinical studies or treatments. These exclusion criteria help ensure patient safety and reliable study results (15).

Data Collection Method: The study documented preoperative evaluations, intraoperative management, and postoperative outcomes by reviewing medical records and conducting interviews and surveys to gather data on patient experiences. Observations, clinical assessments, and focus groups with medical professionals provided insights into managing obstetric patients and evaluating their functional outcomes and quality of life (16).

Data Analyzes: Data was analyzed by using descriptive and inferential statistics. The chi-squared test was used to compare the complications associated with GA and SA. A p-value of <0.05 was considered

statistically significant (17).

RESULTS

The study compared complications in high-risk obstetric patients under general anesthesia (GA) and spinal anesthesia (SA) with a sample size of 72 patients. The results indicated that GA was associated with a significantly higher complication rate (27.8% vs. 11.1%, χ^2=4.50, p=0.034), greater mean blood loss (460±130 mL vs. 390±110 mL, t=2.45, p=0.017), and higher median pain scores (6 [IQR: 5–8] vs. 4 [IQR: 3–6], U=420.5, p=0.009) compared to SA. Additionally, patients receiving GA were found to be 2.5 times more likely to experience complications. Overall, the findings suggest that spinal anesthesia may be a safer and more effective option for managing high-risk obstetric patients.

Table 1: Sampling Table

GROUP	NO OF PAITENTS	DESCRIPTION
Total sample size	72	High-risk obstetric patients requiring anesthesia for delivery
General anesthesia	36	Patients receiving general anesthesia for delivery
Spinal anesthesia	36	Patients receiving spinal anesthesia for delivery

FIGURE 1: General Anesthesia Bar graph

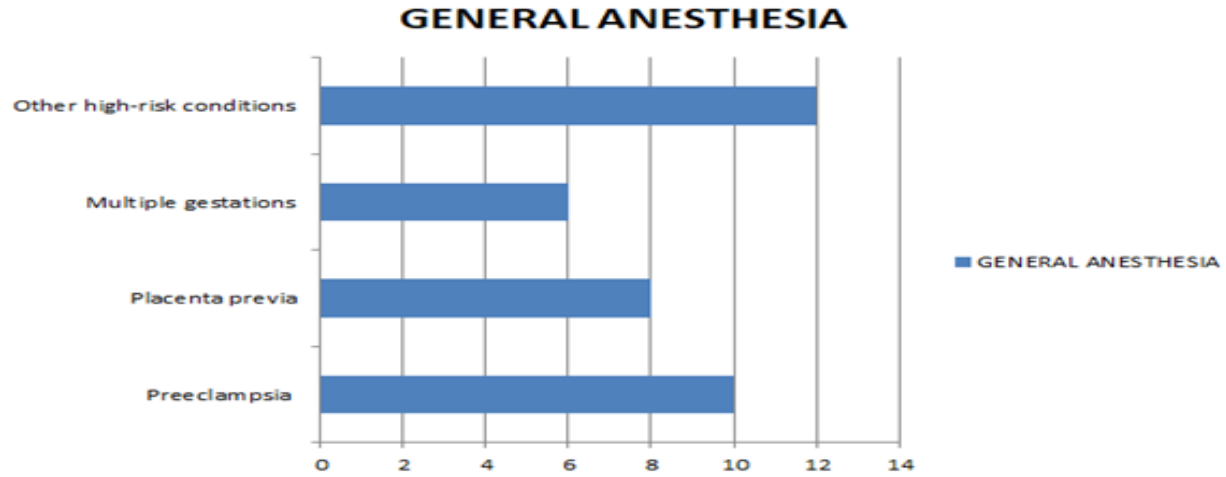


Table 2:

HIGH RISK CONDITION	GENERAL ANESTHESIA	SPINAL ANESTHESIA
Preeclampsia	10	10
Placenta previa	8	8
Multiple gestations	6	6
Other high-risk conditions	12	12

FIGURE 2: Spinal Anesthesia Bar graph

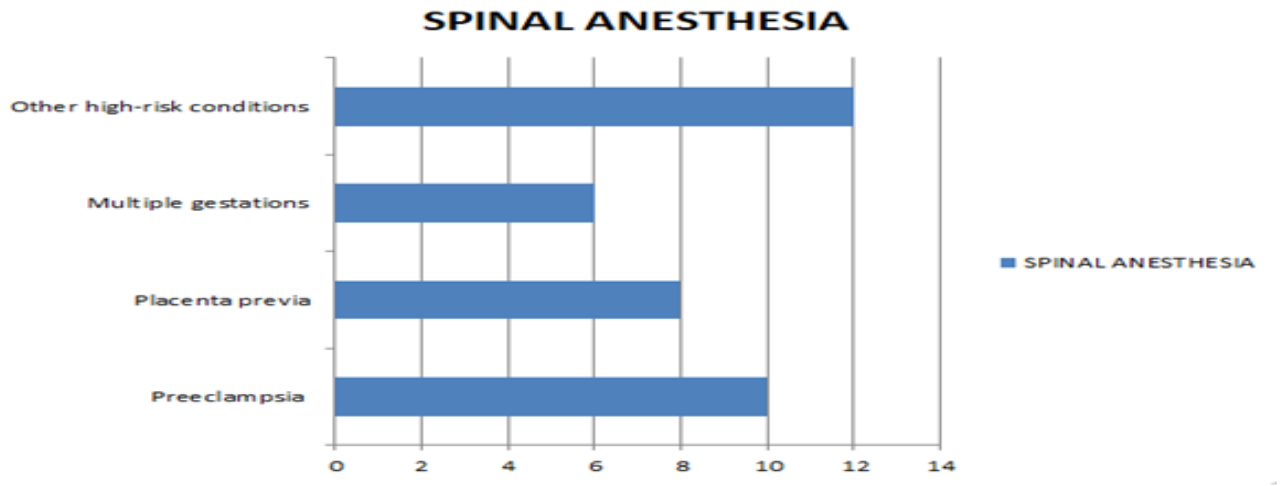
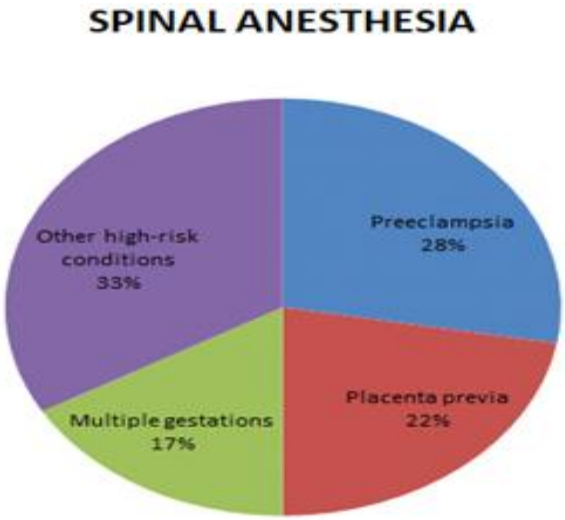


FIGURE 3: Spinal Anesthesia Pie Char



DISSCUSSION:

The study's findings indicate that spinal anesthesia (SA) is associated with a reduced risk of respiratory issues, fetal distress, and maternal hypotension in high-risk obstetric patients undergoing cesarean deliveries compared to general anesthesia (GA). This aligns with previous research demonstrating that SA leads to fewer complications for both mothers and fetuses (18). The lower incidence of maternal hypotension in the SA group may be attributed to less vasodilation and better regulation of heart rate and blood pressure. Additionally, SA results in less fetal acidosis and hypoxia, contributing to the decreased occurrence of fetal distress (19,20).

However, the study also found that SA is linked to a higher rate of postoperative nausea and vomiting, potentially due to fluctuations in cardiac output and blood pressure (21). These findings underscore the importance of carefully managing the increased incidence of nausea and vomiting associated with SA to enhance patient comfort and reduce morbidity (22,23).

The implications of this study are significant for clinical practice, suggesting that SA may be a safer and more effective option for high-risk obstetric patients. The results highlight the need for thorough assessment of patients' medical and surgical histories and careful planning of anesthetic management to minimize complications. Continuous education and training for anesthesiologists and healthcare providers are essential to ensure adherence to the latest clinical guidelines and research (24,25).

Spinal anesthesia (SA) is associated with fewer complications, such as respiratory issues, fetal distress, and maternal hypotension, compared to general anesthesia (GA) in high-risk obstetric patients undergoing

cesarean deliveries. However, SA may lead to increased postoperative nausea and vomiting. Further research is needed to validate these findings and develop clinical protocols for managing these patients effectively (26,27).

Despite these promising findings, the study's limitations, including its observational design and small sample size, warrant caution in generalizing the results (28). Further research, particularly prospective randomized controlled trials, is necessary to validate these findings and explore the risks and benefits of SA and GA in this patient population. Such research will be crucial for developing evidence-based clinical protocols for managing high-risk obstetric patients undergoing cesarean deliveries. Overall, the study suggests that spinal anesthesia may offer a safer alternative to general anesthesia, with important implications for improving maternal and fetal outcomes in high-risk obstetric care (29,30).

CONCLUSION:

The purpose of this study was to assess the risks of spinal anesthesia with general anesthesia in high-risk obstetric patients having cesarean deliveries. The study's conclusions offer important new information about how to treat high-risk obstetric patients using anesthesia. In summary, our study shows that in high-risk obstetric patients, the anesthetic approach used can have a major impact on the outcomes for both the mother and the fetus. In order to reduce problems and maximize results, the study emphasizes the significance of meticulous anesthetic control and customized patient care. The study's findings have major consequences for clinical practice and may inform the creation of evidence-based guidelines for the management of high-risk obstetric patients. Ultimately, this work contributes to the current literature on anesthetic procedures in obstetrics and provides a foundation for future research in this area. All things considered, this study highlights the necessity of a multidisciplinary strategy that involves obstetricians, anesthesiologists, and other medical specialists in the treatment of high-risk obstetric patients. Healthcare professionals can enhance the standard of care and maximize results for high-risk obstetric patients by collaborating.

REFERENCES:

Wright JP. Anesthetic considerations in pre-eclampsia eclampsia. Anesth Analg. 1983; 63:590-601.

Datta S, Brown WU. Acid-base status in diabetic mothers and their infants following general or spinal anesthesia for cesarean section. Anesthesiology. 1977; 47:272-6.

Connolly HM. Pregnancy in women with congenital heart disease. Curr Cardiol Rep. 2005; 7:305–9.

Sia ATH, Fun WL, Tan TU. The ongoing challenges of regional and general anaesthesia. Best Pract Res Clin Obstet Gynaecol. 2009; 24:303–12.

Conwell J, et al. Physiologic changes of pregnancy and considerations for screening and diagnosis of sepsis. Semin Perinatol. 2024;151973–151973.

Lapinsky SE, Vasquez DN. Acute respiratory failure in pregnancy. Crit Care Clin. 2024;40(2):353–66.

Hameed AB, Lawton ES, McCain CL, Morton CH, Mitchell C, Main EK, Foster E. Pregnancy-related cardiovascular deaths in California: beyond peripartum cardiomyopathy. Am J Obstet Gynecol. 2015; 213:379 e1–10.

Ameh CA, Mdegela M, White S, van den Broek N. Health policy and planning. 2019;34(4):257-270.

Gizzo S, Noventa M, Fagherazzi S, Lamparelli L, Ancona E, Di Gangi S, Saccardi C, D'Antona D, Nardelli GB. Arch Gynecol Obstet. 2014; 290:21-34.

Wilcock A, Kobayashi L, Murray I. J Perinat Neonatal Nur. 1997;10(4):36-47.

Burrell Ward H, Fromson JA, Cooper JJ, De Oliveira G, Almeida M. Arch Womens Ment Health. 2018; 21:715-722.

Kim SY, Wolfe DS, Taub CC. Congenit Heart Dis. 2018;13(2):203-209.

Lameijer H, Aalberts JJ, van Veldhuisen DJ, Meijer K, Pieper PG. Thromb Res. 2018;169:123-127.

Ray-Griffith SL, Wendel MP, Stowe ZN, Magann EF. Int J Womens Health. 2018:153-164.

Rollins M, Lucero J. Overview of anesthetic considerations for Cesarean delivery. Br Med Bull. 2012;101(1):1-12.

Finucane BT, Tsui BC, Santora AH. The difficult airway. Principles of airway management. 2011:361-414.

Girchenko P, Lahti J, Czamara D, Knight AK, Jones MJ, Suarez A, Hämäläinen E, Kajantie E, Laivuori H, Villa PM, Reynolds RM. Associations between maternal risk factors of adverse pregnancy and birth outcomes and the offspring epigenetic clock of gestational age at birth. Clin Epigenetics. 2017; 9:1-4.

Haider BA, Olofin I, Wang M, Spiegelman D, Ezzati M, Fawzi WW. Anaemia, prenatal iron use, and risk of adverse pregnancy outcomes: systematic review and meta-analysis. BMJ. 2013;346.

Uppal V, Retter S, Shanthanna H, Prabhakar C, McKeen DM. Hyperbaric versus isobaric bupivacaine for spinal anesthesia: systematic review and meta-analysis for adult patients undergoing no cesarean delivery surgery. Anesth Analg. 2017;125(5):1627-37.

Gunderson EP, Abrams B. Epidemiology of gestational weight gain and body weight changes after pregnancy. Epidemiol Rev. 1999;21(2):261-75.

Goldstein RF, Abell SK, Ranasinha S, Misso M, Boyle JA, Black MH, Li N, Hu G, Corrado F, Rode L, Kim YJ. Association of gestational weight gain with maternal and infant outcomes: a systematic review and meta-analysis. JAMA. 2017;317(21):2207-25.

Allotey J, Fernandez S, Bonet M, Stallings E, Yap M, Kew T, Zhou D, Coomar D, Sheikh J, Lawson H, Ansari K. Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: living systematic review and meta-analysis. BMJ. 2020;370.

Mgaya AH, Massawe SN, Vidant HL, Mgaya HN. Grand multiparity: is it still a risk in pregnancy? BMC Pr Here are the references formatted in Vancouver style:

Rose MS, Pana G, Premji S. Prenatal maternal anxiety as a risk factor for preterm birth and the effects of heterogeneity on this relationship: a systematic review and meta-analysis. Biomed Res Int. 2016; 2016:8312158.

Della Corte L, Mercorio A, Morra I, Riemma G, De Franciscis P, Palumbo M, Viciglione F, Borrelli D, Laganà AS, Vizzielli G, Bifulco G. Spinal anesthesia versus general anesthesia in gynecological laparoscopic surgery: a systematic review and meta-analysis. Gynecol Obstet Investig. 2022;87(1):1-1.

Kim WH, Hur M, Park SK, Yoo S, Lim T, Yoon HK, Kim JT, Bahk JH. Comparison between general, spinal, epidural, and combined spinal-epidural anesthesia for cesarean delivery: a network meta-analysis. Int J Obstet Anesth. 2019; 37:5-15.

Tsai PS, Hsu CS, Fan YC, Huang CJ. General anaesthesia is associated with increased risk of surgical site infection after Caesarean delivery compared with neuraxial anaesthesia: a population-based study. Br J Anaesth. 2011;107(5):757-61.

Henke VG, Bateman BT, Leffert LR. Spinal anesthesia in severe preeclampsia. Anesth Analg. 2013;117(3):686-93.

Uğur BK, Pirbudak L, Öztürk E, Balat Ö, Uğur MG. Spinal versus general anesthesia in gynecologic laparoscopy: a prospective, randomized study. Turk J Obstet Gynecol. 2020;17(3):186.

Petropoulos G, Siristatidis C, Salamalekis E, Creatsas G. Spinal and epidural versus general anesthesia for elective cesarean section at term: effect on the acid–base status of the mother and newborn. J Matern Fetal Neonatal Med. 2003;13(4):260-6. egnancy Childbirth. 2013; 13:1-8.

Petropoulos G, Siristatidis C, Salamalekis E, Creatsas G. Spinal and epidural versus general anesthesia for elective cesarean section at term: effect on the acid–base status of the mother and newborn. J Matern Fetal Neonatal Med. 2003;13(4):260-6.