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Anaesthesia Practice in Caesarean Section Deliveries in Tertiary Care Institute of Eastern Nepal

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ABSTRACT

Introduction: Caesarean section is the most frequently performed surgical procedure in obstetrics. General anaesthesia and regional anaesthesia are the anaesthetic techniques of choice for caesarean delivery. There is a world-wide rise in caesarean section rate during the last three decades and has been a cause of alarm and needs an in-depth study.

Objectives: The objective of this study was to determine the pattern of anaesthesia practice in caesarean Section delivery at a tertiary care centre of eastern Nepal.

Methodology: This cross-sectional study was conducted at one of the tertiary care centre of eastern Nepal from July 2021 to January 2022. Patients who delivered by caesarean section were included in the study. Basic demographic data , clinical indications, type of anaesthesia admininstered and complications after anaesthesia were noted.

Results: Out of the total 1222 cases, 1180 (96.56%) were emergency caesarean and 42 (3.43%) were elective caesarean. On observing the indications, previous lower section caesarean section was found to be in most patients i.e. 300(24.54%), followed by fetal distress 204 (16.69%), failed induction in 185 (15.13%),non progress of labour 100 (8.18%), eclampsia 70 (5.72%), preclampsia 69(5.64%), meconium stained liquor 65 (5.31%) and others were 195 (15.87%). The spinal anaesthesia being the preferred choice, 1167 (95.49%) patients, followed by general anaesthesia in 53 (4.33%) patients and epidural anaesthesia 2 (0.16%) patients.

Conclusion: Spinal anaesthesia is the most frequently used form of anaesthesia for caesarean section. Majority of caesarean section were emergency.

INTRODUCTION

Ideal rate for caesarean sections quoted by the international healthcare community is between 10% and 15%.[1] Caesarean section remains one of the most common surgical procedures worldwide, with an increasing prevalence over recent years. Caesarean section is considered to be lifesaving surgical procedure in non-reassuring fetal conditions, obstetric hemorrhage and abnormal fetal presentation therefore the provision of safe and effective anesthesia during CS is paramount, not only for maternal well-being but also for optimal fetal outcomes.[2,3] Rising trend in the rate caesarean section (CS) is not just in high-income countries only but also in the low and middleincome countries for a variety of reasons.[4] In a study carried out at Kathmandu Medical College, caesarean section deliveries accounted for 45.81% which was high than recommended by WHO which is 10-15%.[5] In other study done by ME Hannah et al perinatal and neonatal mortality and morbidity was significantly lower for planned caesarean section group than planned vaginal delivery in a patient with breech presentation. [6] The widespread use of caesarean section has progressively increased over the world. According to Betran et al. the global CS rate raised by 12.4% from 1990 (6.7%) to 2014 (19.1%), with the Caribbean (40.5%) leading the CS rate, followed by Northern America (32.3%), Oceania (31.1%), Europe (25.0%), Asia (19.1%) and Africa

having the least CS rate (7.3%).[7]

This increased rate could be due to the rising number of caesarean sections performed at the request of the mothers due to a perceived relative safety, development of fetal monitoring, intensive treatment technologies for premature babies, the increase of repeat caesarean sections after a previous section, the increase of elderly primiparas, medical personnel and medical practices, the legal system, and the expansion of surgical indications for the procedure. [8,9] Thus increasing number of parturient requiring anaesthesia. Increasing the rate of caesarean section paramount the effective and safe anaesthesia practices. Caesarean sections may be associated with risk which can extend many years beyond the current delivery and may affect the health of the woman, her child, and future pregnancies. These risks are greater in women, especially in remote area, with limited access to obstetric care. [10,11]

Anesthesia related maternal mortality during or after CS was disproportionately high in Low- and middle-income countries. [12] Mortality and Morbidity rate is high for both maternal and neonates in CS under GA compared to SAB.[13] Recommendations are to keep the rate of GA below 5% for elective caesarean section and below 15% for emergency caesarean section.[14] Sub subarachnoid block is considered gold standard for caesarean section.[15] Therefore, implications of rising trend in CS are more likely to affect low and middle income countries. In tertiary care hospitals, where complex cases are often managed ensuring the highest standards of anesthesia practice.

A study in the United Kingdom showed that the rate of caesarean section has increased from 12.5% in 1990 to 18.3% in 1999[16] while in China, there has been an increase from 8.9% in 1993–1994 to 24.8%.[17]

The objective of this study was to explore the practice of anaesthesia for caesarean section at tertiary care hospital in the eastern part of Nepal.

METHODOLOGY

This is prospective cross sectional observational study carried out after ethical clearance from Institutional Review Committee of Nobel Medical College Teaching Hospital (NMCTH) with reference number 61912022. All cesarean sections done from July 2021 to January 2022 were included. It included all pregnant women more than 28 weeks of gestation undergoing cesarean section delivery at NMCTH operation theater and followed up till discharge. The exclusion criteria were patient less than 28th weeks of gestation, caesarean hysterectomy following surgery patients and parturients refusing to be a part of study. NMCTH is one of the tertiary care hospital of eastern Nepal with a high number of parturients.

Frequencies and percentages were calculated to tabulate the data. Anesthesiologist performing procedure filled out the required data in predesigned Performa. Parturients undergoing were explained about the study and the process of data entry in the predesigned Performa.

RESULTS

In this study of 1222 participants, the majority (55.15%) were between 25-30 years old, with 22.5% aged 18-25 years, and 21.44% aged 30-35 years. Parity analysis showed that most women had two children (55.40%), while 23.15% had one child. Nearly all cases (99.83%) were classified as ASA II, indicating a generally healthy population. The primary indications for cesarean section (CS) included previous LSCS (24.54%), fetal distress (16.69%), and failed induction (15.13%). Antepartum hemorrhage was the leading reason for general anesthesia (22.64%). Hypotension was the most frequent intraoperative complication, affecting 52.08% of cases. Emergency CSs had a significantly higher complication rate compared to elective CSs.

Table 1: Demographic and Health Characteristics of Participants (N=1222)

Characteristics		Number (N)	Percentage
Age (years)	<18	5	0.40%
	18-25	275	22.50%
	25-30	674	55.15%
	30-35	262	21.44%
	>35	6	0.50%
Parity	0	12	0.98%
	1	283	23.15%
	2	677	55.40%
	3	50	4.09%
	>3	200	16.36%
ASA Grade	II	1206	99.83%
	III	16	1.30%

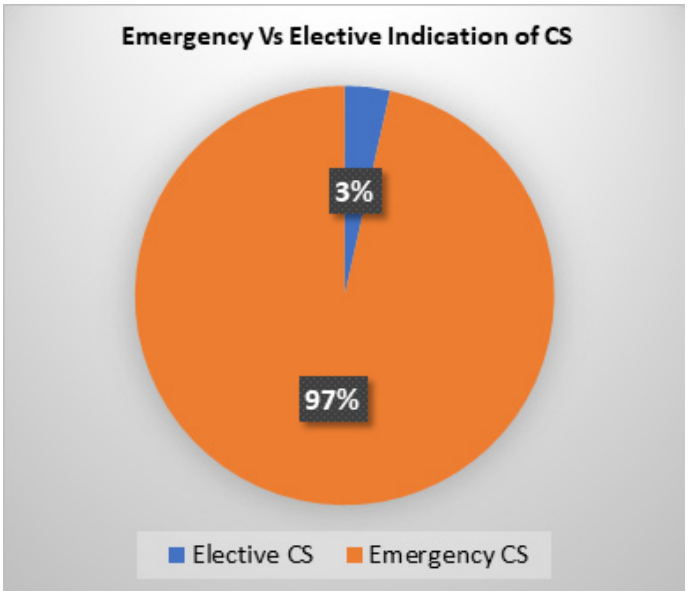

Fig 1: Emergency versus Elective indications for CS

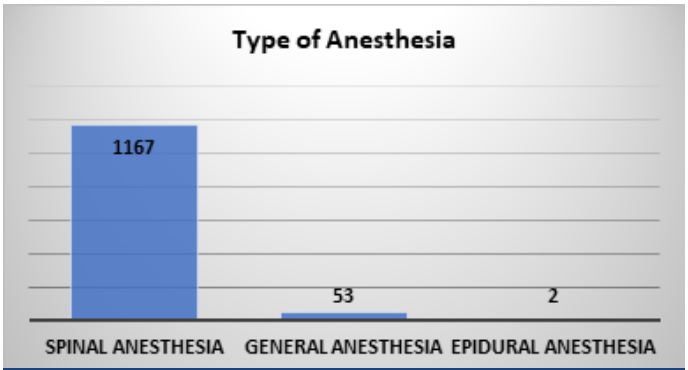

Fig 2: Type of Anesthesia in CS

Table 2: Indications for CS

INDICATIONS FOR CS	NUMBER (N) = 1222	PERCENTAGE
FAILED INDUCTION	185	15.13%
FETAL DISTRESS	204	16.69%
PREVIOUS LSCS	300	24.54%
MECONIUM STAINED LIQUOR	65	5.31%
PRECLAMPSIA	69	5.64%
NON PROGRESS OF LABOUR	100	8.18%
ECLAMPSIA	70	5.72%
OTHERS	229	18.73%

Table 3: Indications for GA

INDICATIONS FOR GA	NUMBER	PERCENTAGE
ECLAMPSIA	9	16.98%
FAILURE OF NEURAXIAL	5	9.43%
PATIENTS REQUEST	8	15.09%
COAGULOPATHY	4	7.54%
ANTEPARTUM HAEMORRAGHE	12	22.64%
FETAL DISTRESS	7	13.20%
OTHERS	8	15.09%

Table 4: Intraoperative Complications

COMPLICATIONS	NUMBER (N) = 96	PERCENTAGE
HYPOTENSION	50	52.08
HAEMORRHAGE	12	12.5
ANEMIA	10	10.41
NAUSEA	18	18.75
VOMITTING	4	4.16
SEPSIS	2	2.08

Table 5: Type of Surgery and Complications

COMPLICATIONS	ELECTIVE CS	EMERGENCY CS
YES	5	91
NO	37	1089

DISCUSSION

Caesarean section is most common surgical procedure in obstetrics and undeniably most ancient operations in surgery.[18] General anaesthesia during caesarean section has decrease in recent years because of difficulty in airway and poor fetal outcome.[19] General anaesthesia for caesarean section has decreased with increase in implementation of spinal anaesthesia worldwide. Regional anaesthesia in forms of spinal anaesthesia, epidural anaesthesia and combined spinal and epidural is generally used for caesarean section. [20,21] During 1980s and 1990s there was decrease in implementation of spinal anaesthesia which was reverse of what is being done today. [22] Additionally, Tae-Yun Sung et al concluded that general anaesthesia is associated with more bleeding than spinal anaesthesia.[23]

The aim of this study was to examine obstetric anesthesia practices at Nobel Medical College, a tertiary care center located in eastern Nepal. This study demonstrates that spinal anesthesia is the most preferred technique for cesarean sections, aligning with global practices. The findings are consistent with studies from other countries. For instance, a study by Imarengiaye et al. concluded that spinal anesthesia is the preferred choice for cesarean sections in tertiary hospitals in Nigeria. [20]

The data of our study reveals the rate of caesarean section to be 1222 during six months duration. Out of total caesarean section 96.56% were emergency followed by 3.40% as elective caesarean section. The type of anaesthesia out of all caesarean section were as follows spinal 95.49% (1167), general anaesthesia 4.33% (53) and epidural 0.16%. Majority of cases were performed under single shot spinal. Indication for GA was previous lscs (24.54%), fetal distress (16.69%) and failed induction (15.13%). There were no previous study where anaesthesia practice for caesarean section could be compared in eastern part of Nepal. However, in our study emergency caesarean section were not according to the grades of urgency as classified by Lucas et al.[24] In consistent to our study regional anaesthesia is safer technique than general anaesthesia, compared to data done by Stamer UM et al with a significant increase in regional anaesthesia .[25] Use of regional anaesthesia has been a marker for quality of obstetric anaesthesia. [26]

In our study epidural analgesia was sparely used. The reason for this could be due to inadequate manpower, additional cost to patients, time efficiency, lesser number of obstetric anaesthesiologists may be the reasons for non-application of labour epidural analgesia in our setup. In a study by Kinsella SM 26% of parturient had epidural analgesia.[27] General anesthesia was the preferred technique previously but now has been changed to regional anesthesia due to lower incidence of complications as seen in our study. Difficult airway, physiological changes, risk for aspiration and fetal depression due to drugs used in general anaesthesia has made general anaesthesia less popular in caesarean section. Whereas general anaesthesia is still most appropriate technique in cases of profound fetal bradycardia, ruptured uterus, placental abruption, coagulopathy, maternal comorbidities, patient under anticoagulant therapy and hemodynamic compromised parturient. [28]

In our study intraoperative complications rate was 7.85% which is lower compared to study done by AT Kayembe et al where complication rate was 34.12%. [29] Intraoperative hypotension was most common followed by nausea in our study. A thorough preoperative and intraoperative assessment and careful monitoring during and after anaesthesia may be the reason for less intraoperative complications in our study . Hemorrhage during caesarean section may lead to severe morbidity, the use of uterotonics as well as skilled surgical techniques and vigilant postoperative monitoring may mitigate this risk. Analgesia by epidural catheter is not popular in developing countries for urgent caesarean section may be the reason for less epidural anesthesia in our centre. The demand of labour epidural analgesia and its application in emergency caesarean section may be recognized in future. There was no any difficulty related to airway, failed intubation and anaesthesia related mortality in our study. Our study is just a tip of iceberg regarding the practice of obstetric anaesthesia which may not represent the practice in the whole country. Multicentred randomised studies may be needed to reflect more ideal scenario.

Caesarean sections are often necessary and life-saving that carries a risk of complications that healthcare providers must address proactively. Comprehensive preoperative planning, intraoperative vigilance, and postoperative care strategies are essential in minimizing risks and ensuring optimal outcomes for mothers and infants. Continuous training and development and adherence to protocols are necessary to provide high quality of services.

CONCLUSION

Spinal anaesthesia is the most preferred and thus frequently used form of anaesthesia for caesarean section. It Is safe and effective method of anaesthesia for both emergency and elective caesarean section deliveries in relation to complications. The operative urgency and optimal anaesthesia method should be taken care for safety in both to mother and fetus.

LIMITATIONS OF THE STUDY

This study is not without limitations. Urgency for caesarean section was not categorised. Newborn outcomes were not assessed. Study was single centred and admissions to tertiary care centred are related to pregnancy complications that could have been influence delivery mode.

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CONFLICT OF INTEREST

There are no any conflict of interest amongst the co-authors.

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