

Original Article

Assessment of Incidence of Failure of Spinal Anesthesia Necessitating the Conversion to General Anesthesia in Women Presenting For Caesarean Section: An Observational Study

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ABSTRACT:

Background: Caesarean section rate is increasing in developing countries as the only other way of delivery apart from spontaneous vertex delivery. Regional, general, or local anaesthesia are the three modes of anaesthesia offered during caesarean section without which no surgery can take place. **Aim of the study:** To evaluate incidence of failure of spinal anesthesia necessitating the conversion to general anesthesia in women presenting for caesarean section. **Materials and methods:** The study was conducted in the department of Anesthesiology Zanana Hospital, R.B.M. Hospital, Bharatpur, Rajasthan, India. For the study, the selection of subjects was done by including all mothers scheduled for caesarean section under regional anesthesia in the obstetric theatre. A total of 116 patients were included in the study. The data was collected using a questionnaire which was partly filled by the investigator in the ward and the last part in theatre as the operation went on. Patient's details were entered including age, weight and height, indication for caesarean section and parity. **Results:** We observed that mean age of the patients was 26.09 years. Mean BMI of the patients was 29.28 kg/m². 8.62% of the total cases were converted to general anesthesia due to failure of spinal anesthesia. The results were statistically significant.

Conclusion: The Incidence of Failure of Spinal Anesthesia Necessitating the Conversion to General Anesthesia is 8.62%.

Keywords: C-section, General anesthesia, spinal anesthesia.

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INTRODUCTION:

Caesarean section rate is increasing in developing countries as the only other way of delivery apart from spontaneous vertex delivery. Regional, general, or local anaesthesia are the three modes of anaesthesia offered during caesarean section without which no surgery can take place.¹ Regional anaesthesia (R/A) is the primarily recommended and most commonly used mode while general anaesthesia (G/A) is indicated in cases where there is a contraindication to regional anaesthesia or on patient's request. General anaesthesia is sometimes instituted even when regional anaesthesia has already been administered.² Conversion from regional to general anaesthesia does occur either pre- or intraoperatively exposing a patient to complications of both modes of anaesthesia. Conversion poses a challenge to the attending anaesthetist and the

entire team as a whole. There are several reasons why conversion may occur.⁴ Documentation of events leading to conversion will aid the future anaesthetist in appropriate obstetric patient handling. It is also important that the client appreciates the reasoning behind the changes and application of anaesthetics.^{5,6} Hence the present study was planned to evaluate incidence of failure of spinal anesthesia necessitating the conversion to general anesthesia in women presenting for caesarean section.

MATERIALS AND METHODS:

The study was conducted in department of Anesthesiology the Zanana Hospital, R.B.M. Hospital, Bharatpur, Rajasthan, India. The ethical clearance for the study was obtained from the ethical board of the institute prior to commencement of the study. For the study, the selection of

subjects was done by including all mothers scheduled for caesarean section under regional anesthesia in the obstetric theatre.

Inclusion criteria:

1. All who gave informed consent.
2. Parturients who were planned caesarean section under regional anaesthesia
3. Parturients that were weighed and their heights taken.

Exclusion criteria:

1. Parturients planned for general anaesthesia.
2. Parturients who refused to participate.
3. Parturients in whom we couldn't obtain height and weight.

The eligible patient or their next of kin for those who were unable to consent gave informed consent and completed a consent form before being involved in the study. A total of 116 patients were included in the study. The data was collected using a questionnaire which was partly filled by the investigator in the ward and the last part in theatre as the operation went on. Patient's details were entered including age, weight and height, indication for caesarean section and parity. In theatre we observed the administration of spinal anaesthesia, cadre of anaesthetist, position during administration, anaesthetic agents that were used and the height of block during spinal anaesthesia were recorded. In case conversion occurred, time of conversion, type of conversion and complication of conversion were recorded.

The statistical analysis of the data was done using SPSS version 20.0 for windows. The Student's t-test and Chi-square test were used to check the significance of the data. The p-value less than 0.05 was predetermined as statistically significant.

RESULTS:

Table 1 shows the demographic data of the patients. We observed that mean age of the patients was 26.09 years. Mean BMI of the patients was 29.28 kg/m². No. of elective cases were 19 and no. of emergency cases were 97. Table 2 shows the incidence of Failure of Spinal Anesthesia Necessitating the Conversion to General Anesthesia. We observed that 8.62% of the total cases were converted to general anesthesia due to failure of spinal anesthesia. The results were statistically significant (p<0.05) [Fig 1].

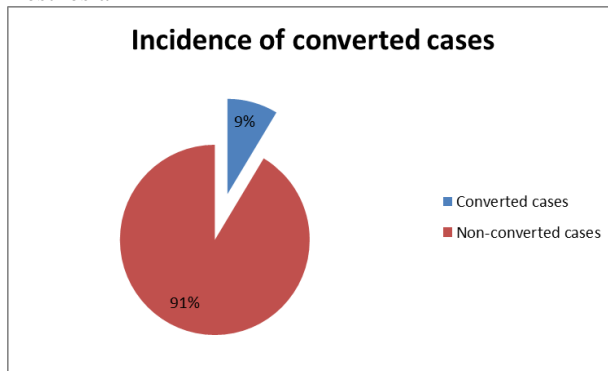
Table 1: Demographic data of the patients

Characteristic parameters	Mean values
Mean age (years)	26.09
Mean BMI (kg/m ²)	29.28
Classification of cesarean section	
• Elective (cases)	• 19
• Emergency (cases)	• 97

Table 2: Incidence of Failure of Spinal Anesthesia Necessitating the Conversion to General Anesthesia

Variables	No. of cases n, %	p-value
Total no. of cases	116	0.023
Converted cases	10 (8.62%)	
Non-converted cases	106 (91.38)	

Figure 1: Incidence of cases converted to General Anesthesia



DISCUSSION:

In the present study we evaluated incidence of failure of spinal anesthesia necessitating the conversion to general anesthesia in women presenting for caesarean section. We observed that incidence of cases converted to C-section because of failure of spinal anesthesia was 8.62%. But the results were statistically significant. The results were compared with previous studies and results were consistent with previous studies. Seljogi D et al determined whether the administered spinal bupivacaine dose for performing a cesarean section under spinal anesthesia was related to the conversion rate to general anesthesia. Retrospective analysis was performed on 1252 electronic data and file of patients who underwent a cesarean section under spinal anesthesia between 2004 and 2011. In 15 patients, spinal anesthesia was converted into general anesthesia due to block failure. Patients in whom a bupivacaine dose of 8 mg or smaller was administered had significantly higher conversion rate. The relative risk of conversion with a 8 mg dose or lower is 4.88. This retrospective study showed that a low dose administration a bupivacaine 0.5% for spinal anesthesia in cesarean section patients elicits significantly more frequent conversion to general anesthesia. Algert CSet al compared regional block versus general anaesthesia for caesarean section and neonatal outcomes. Cohorts of caesarean sections by indication (that is, planned repeat caesarean section, failure to progress, foetal distress) were selected from the period 1998 to 2004 (N = 50,806). Deliveries performed under general anaesthesia were compared with those performed under spinal or epidural, for the outcomes of neonatal intubation and 5-minute Apgar (Apgar5) <7. The risk of adverse outcomes was increased for caesarean sections under general anaesthesia for all three indications and across all levels of hospital.

The relative risks were largest for low-risk planned repeat caesarean deliveries: resuscitation with intubation relative risk was 12.8 (95% confidence interval 7.6, 21.7), and Apgar5 <7 relative risk was 13.4 (95% confidence interval 9.2, 19.4). The largest absolute increase in risk was for unplanned caesareans due to foetal distress: there were five extra intubations per 100 deliveries and six extra Apgar5 <7 per 100 deliveries. They concluded that the infants most affected by general anaesthesia were those already compromised in utero, as evidenced by foetal distress. The increased rate of adverse neonatal outcomes should be weighed up when general anaesthesia is under consideration.^{7,8}

Martin TC et al compared maternal and neonatal outcomes comparing general anaesthesia (GA) and the early experience with spinal anaesthesia (SA) for CS in Antigua and Barbuda. Data obtained included maternal age, gravidity, parity, indication for operation, emergent versus routine operation and type of anaesthesia used. Outcome data comprised estimated blood loss, transfusion requirement, length of stay, postoperative wound infection for mothers. Data obtained for babies included birthweight, one and five minute Apgar scores, neonatal special care unit admission or perinatal death. The sample population included 103 CS patients who underwent GA and 45 who underwent SA. There was no difference in age, gravidity, parity or emergency vs routine CS. Mothers who underwent GA had significantly greater estimated blood loss and rate of transfusion. There was a trend toward longer hospital stay but a lower rate of postoperative wound infection for mothers who underwent GA. There were no maternal deaths. Babies demonstrated no difference in birthweight but those born to mothers who underwent GA had significantly lower one minute and five minute Apgar scores, with a trend toward more frequent neonatal special care unit admission 26.2% vs 17.7%, $p < 0.20$) and perinatal death. GA and SA appear equally safe, but SA was associated with significantly better outcome for both mothers and babies. AT A et al determined the incidence of failure of spinal anaesthesia necessitating the conversion to general anaesthesia or the use of supplemental analgesia in women presenting for Caesarean section and to identify the contributory factor(s) to the failure. It was a prospective study of 414 women who had spinal anaesthesia for Caesarean section. The study was carried out in a University Teaching Hospital in South-Western Nigeria. Women who had single-shot spinal anaesthesia for Caesarean section from April 2010 to March 2011 were prospectively studied using a standard proforma to record details of their demographic, clinical features, surgical and anaesthetic data and outcome. The failed spinal anaesthesia rate in this study was 6.0%.

The experience of the anaesthetist was a significant contributing factor for partial or complete failure necessitating conversion to general anaesthesia ($p = 0.02$). Intra-operative supplemental analgesic was required in 6.4% of those who had their surgery completed under spinal anaesthesia. Postpartum sterilization, exteriorization of the uterus during surgery, and surgical complications were significant risk factors for partial failure necessitating supplemental intra-operative analgesic. They concluded that spinal anaesthesia conversion rate is high in this study when compared with reports from developed countries. Adequate training for residents in anaesthesia will decrease the failure rate. Parturients undergoing sterilization during Caesarean section may require supplementary analgesia.^{9,10}

CONCLUSION:

Within the limitations of the study we conclude that the Incidence of Failure of Spinal Anesthesia Necessitating the Conversion to General Anesthesia is 8.62%.

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