

# Comparison of Epidural and Spinal Anesthesia in Patients Undergoing C-Section.

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## ABSTRACT

**Background:** Caesarean section is the most common surgical procedure performed in India. Although it has been generally agreed that spinal anesthesia (SA) is the preferred anesthetic technique for Cesarean delivery (CD), epidural anesthesia is advised when an epidural catheter is already in place. However, the efficacy of epidural anesthesia has been reported as inferior to that of SA in both elective and emergency situations. Aim of the study: To compare epidural and spinal anesthesia in patients undergoing C-section. **Methods:** The study was conducted in the Department of Gynecology and Obstetrics and Department of Anaesthesia, Narayan Medical College and Hospital, Jamuhar, Sasaram, Bihar, India. For the study, patients scheduled for caesarian section were included. Patients who had malfunctioning epidural catheter or improper epidural placement or complicated pregnancy were excluded from the study. A total of 30 patients were included. A written informed consent was obtained from all the participants in the study. To include the patients in the study, it was made sure that they had physical status of I-II; full-term, singleton pregnancy. On the day of surgery, patients were advised to fast for at least 8 hours before the surgery. For the anesthesia, patients were randomly grouped into two groups, Group I and Group II. Patients in Group I was anesthetized with epidural anesthesia and patients in Group II were anesthetized with spinal anesthesia. **Results:** In the present study, a total of 30 patients were selected. Patients were randomly grouped into Group I and Group 2. The mean age in group 1 was 36.32 years and in group 2 was 35.11 years. The mean height in group 1 was 160.21 cm and in group 2 was 159.21 cm. The mean body weight was 71.11 kg in group 1 and was 70.26 kg in group 2. The Apgar scores at 1 min in Group I was 9.22 and in group II was 8.89. The Apgar scores at 5 min in Group I was 9.56 and in group II was 9.32. VAS pain scores on postoperative day 1 in Group 1 was 2.89 and in Group 2 was 3.16. **Conclusion:** From the present study, this can be concluded that the effect of anesthesia on the newborn in both the groups was similar and had no different effects.

**Keywords:** Epidural Anesthesia, Spinal Anesthesia, C-Section.

## INTRODUCTION

Caesarean section is the most common surgical procedure performed in India. General anaesthesia for caesarean section has been shown to be associated with higher maternal morbidity and mortality than regional anaesthetic techniques.<sup>[1,2]</sup> Therefore, regional anaesthesia for caesarean section should be preferred when balancing the risks and benefits for the mother and her fetus. Both spinal anaesthesia and epidural anaesthesia (EDA) have been shown to provide effective anaesthesia for caesarean section. A trend of preference for spinal anaesthesia for elective caesarean section is, among others, thought to be due to the perceived advantages

of simplicity of technique and density of spinal anaesthetic block.<sup>[3,4]</sup> Although it has been generally agreed that spinal anesthesia (SA) is the preferred anesthetic technique for Cesarean delivery (CD), epidural anesthesia is advised when an epidural catheter is already in place. However, the efficacy of epidural anesthesia has been reported as inferior to that of SA in both elective and emergency situations. Although it has been associated with a high incidence of deleterious effects, such as high-level or total spinal block, respiratory insufficiency, and hypotension an increased use of SA for intrapartum CD following epidural labor analgesia (ELA) has been observed.<sup>[5,6]</sup> Hence, the present study was conducted to compare epidural and spinal anesthesia in patients undergoing C-section.

## MATERIALS AND METHODS

The study was conducted in the Department of Gynecology and Obstetrics and Department of

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Anaesthesia, Narayan Medical College and Hospital, Jamuhar, Sasaram, Bihar, India. The ethical clearance for study protocol was obtained from ethical committee of the institution. For the study, patients scheduled for caesarian section were included. Patients who had malfunctioning epidural catheter or improper epidural placement or complicated pregnancy were excluded from the study. A total of 30 patients were included. A written informed consent was obtained from all the participants in the study. To include the patients in the study, it was made sure that they had physical status of I-II; full-term, singleton pregnancy. On the day of surgery, patients were advised to fast for at least 8 hours before the surgery. For the anesthesia, patients were randomly grouped into two groups, Group I and Group II. Patients in Group I was anesthetized with epidural anesthesia and patients in Group II were anesthetized with spinal anesthesia. The procedure of anesthesia was performed by the residents following standard guidelines. Participants in both groups were monitored with automated blood pressure cuffs, electrocardiograms, and pulse oximetry after arriving in the operating room. The effect of anesthesia on newborn was assessed by monitoring newborn Apgar scores at 1 min and 5 min, and by assessing maternal pain scores after caesarean section.

The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student's t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistical significant.

### RESULTS

**Table 1: Demographic data of the patients.**

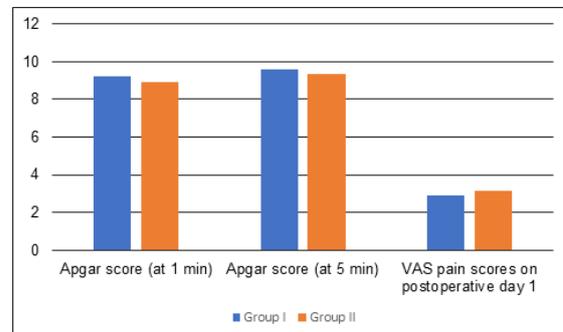
Variable	Group 1	Group 2	p-value
Age (years)	36.32	35.11	0.61
Height (cm)	160.21	159.21	0.21
Body weight (kg)	71.11	70.26	0.88
ASA (I/II)	10/5	9/6	0.21
Block level	5.36	5.81	0.66

**Table 2: Newborn Apgar scores and maternal pain scores after caesarean section**

	Group I	Group II
Apgar score (at 1 min)	9.22	8.89
Apgar score (at 5 min)	9.56	9.32
VAS pain scores on postoperative day 1	2.89	3.16

In the present study, a total of 30 patients were selected. Patients were randomly grouped into Group I and Group 2. [Table 1] shows the demographic data of the patients. The mean age in group 1 was 36.32 years and in group 2 was 35.11 years. The mean height in group 1 was 160.21 cm and in group 2 was 159.21 cm. The mean body weight was 71.11 kg in group 1 and was 70.26 kg in group 2. [Table 2] shows the newborn Apgar scores and maternal pain

scores after caesarean section. The Apgar scores at 1 min in Group I was 9.22 and in group II was 8.89. The Apgar scores at 5 min in Group I was 9.56 and in group II was 9.32. VAS pain scores on postoperative day 1 in Group 1 was 2.89 and in Group 2 was 3.16.



**Figure 1: Newborn Apgar scores and maternal pain scores after caesarean section**

### DISCUSSION

In the present study, we observed significant that the Apgar score in both the groups was very similar and did not have any much difference. The results were compared with previous studies. Shin YD et al compared the merits and demerits of spinal anaesthesia and epidural anaesthesia to determine the most efficient approach. Mothers meeting the American Society of Anesthesiologists physical status classification system (ASA) I or II, who underwent caesarean sections at our hospital were surveyed retrospectively. The survey targeted one hundred patients each who received spinal anaesthesia and epidural anaesthesia. The time from anaesthesia to surgical incision (A to S time), entire anaesthesia time, and the usage of vasopressor and midazolam were compared according to anaesthetic approach. The A to S time and the entire anaesthesia time of the group that underwent spinal anaesthesia were significantly short compared to the times recorded for the group who underwent epidural anaesthesia, and the use of vasopressor was more frequent in the spinal anaesthesia group because their blood pressure decline was larger. It was concluded that the A to S time and the entire anaesthetic time were longer for epidural anaesthesia than for spinal anaesthesia. However, the haemodynamic change was smaller and vasopressor was hardly used in the former group. Therefore, the choice of the technical method will depend on the clinical, anaesthetic, and obstetric situation. Schewe JC et al investigated whether there is a positive effect of either spinal or epidural anaesthesia on postoperative analgesic requirements and pain relief. The analgesic effect of either spinal or epidural induction of perispinal anaesthesia have been compared in 132 women (ASA I or II) scheduled for elective caesarean section, all having epidural

catheterization for perioperative anaesthesia and postoperative analgesia. The patients were randomized into two groups. To achieve a sensory block height to the level of the sixth thoracic dermatome, the parturients received isobaric bupivacaine 0.5% and 5 microg sufentanil intrathecally or ropivacaine 0.75% and 10 microg sufentanil epidurally. For postoperative analgesia, all patients used patient-controlled epidural analgesia at identical settings [bolus of ropivacaine 0.133% (11-15 mg according to patient's height), lock-out time 1 h]. Intraoperative and postoperative pain was recorded using a visual analogue pain score as well as analgesic requirements over the first 24 h after surgery. One hundred and twenty-five patients completed the study. There were no differences in patient-controlled epidural analgesic requirements between groups. During surgery, the pain score on a visual analogue scale was more intense with epidural anaesthesia than with spinal anaesthesia. For the whole 24 h observation period, the area under the curve for pain was lower with spinal anaesthesia. At almost all postoperative time points, visual analogue scale scores at rest and during mobilization were lower with spinal anaesthesia, which was accompanied by less motor blockade and lower frequency of adverse effects. More patients with epidural anaesthesia received supplemental analgesic medication. They concluded that in parturients undergoing elective caesarean section, postoperative use of epidural ropivacaine via patient-controlled epidural analgesia is similar after spinal and epidural anaesthesia.<sup>[7,8]</sup>

Van de Velde M et al performed a retrospective chart analysis to evaluate the effects of combined spinal-epidural anaesthesia on maternal haemodynamics and fetal outcome compared to conventional epidural anaesthesia. A retrospective anaesthesia chart analysis of all pre-eclamptic patients who underwent Caesarean section over a 4 yr period was performed. Patient characteristic, obstetric, haemodynamic, fetal and neonatal data were gathered and analysed according to the anaesthetic technique used. Seventy-seven pre-eclamptic parturients undergoing Caesarean section were identified. Epidural anaesthesia was performed in 62 patients and combined spinal-epidural anaesthesia was performed in 15. No differences in patient characteristic and obstetric data were noted. Highest mean arterial pressure prior to anaesthesia was comparable between the groups as well as the lowest recorded mean arterial pressure following anaesthesia. In the combined spinal-epidural anaesthesia group more ephedrine was used compared to the epidural group. However, more lactated Ringer's was used in the epidural group. Umbilical artery pH was lower in the epidural group. Similar results were noted in 26 severely pre-eclamptic patients. Seven women underwent combined spinal-epidural anaesthesia and 19

underwent epidural anaesthesia in the severely pre-eclamptic group. Also more ephedrine was used in the combined spinal-epidural anaesthesia group. A tendency towards a lower umbilical artery pH was observed in the epidural group but this difference did not reach statistical significance. Combined spinal-epidural anaesthesia appears to be safe as anaesthetic technique for pre-eclampsia and severe pre-eclampsia. However, it is important to consider the retrospective design of the study and the large number of epidural anaesthetics performed. Visser WA et al examined their routine clinical practice of removing the in situ epidural, rather than attempting to convert to ESA, prior to administering SA for intrapartum CD. Hemodynamic data, frequencies of either high or total spinal block, and maternal and neonatal outcome data were gathered from the anaesthesia records of all parturients at the Amphia Hospital, undergoing intrapartum CD between January 1, 2001 and May 1, 2005. Complete data were available for 693 patients (97.6%) of the 710 medical records that were identified. Of the 693 patients, 508 (73.3%) had no ELA and received SA, 128 patients (18.5%) received SA following epidural anaesthesia for labor, 19 (2.7%) underwent conversion of ELA to ESA, and 38 (5.5%) received general anaesthesia. When comparing both SA groups, no clinically relevant differences were observed regarding the incidence of total spinal block (0% in both groups) or high spinal block. The number of hypotensive episodes, the total amount of ephedrine administered, and the Apgar scores recorded at 5 and 10 min were similar amongst groups. They concluded that the incidence of serious side effects associated with SA for intrapartum CD following ELA is low and not different compared to SA only.<sup>[9,10]</sup>

## CONCLUSION

From the present study, this can be concluded that the effect of anesthesia on the newborn in both the groups was similar and had no different effects.

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