

# Comparative Assessment of Spinal and Epidural Anesthesia in Patients Undergoing Cesarean Section at a Tertiary Care Centre

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## ABSTRACT

**Background:** A caesarean section (CS) is a life-saving surgical procedure when certain complications arise during pregnancy and labour. We planned the present study to assess and compare the efficacy of spinal and epidural anesthesia in patients in undergoing cesarean section.

**Materials & Methods:** The present study included assessment and comparison of the efficacy of spinal and epidural anesthesia in patients in undergoing cesarean section. A total of 30 patients scheduled to undergo CS were included in the present study and were broadly divided into two study groups with 15 patients in each group as follows: Group 1: Patients undergoing CS under spinal anesthesia, Group 2: Patients undergoing CS under General anesthesia. Complete demographic details of all the patients were obtained. Spinal anesthesia was administered to patients of group 1 and epidural anesthesia was given to patients of group 2. Time from administration of anesthesia to the time of surgical anesthesia was denoted as AS time and was recorded in all the patients. VAS (visual analogue score) was recorded in all the patients one day after surgery.

**Results:** Significant results were obtained while comparing the mean AS time in between subjects of group 1 and group 2.

Significant results were obtained while comparing the mean total anesthetic time in between subjects of both the study group. However; on comparing the VAS score in between the two study groups, non- significant results were obtained.

**Conclusion:** Both spinal and epidural anesthesia was equally effective in patients undergoing CS. However; in terms of time duration for attainment of anesthesia, epidural anesthesia was associated with significantly longer time duration.


**Key words:** Anesthesia, Cesarean Section, Epidural, Spinal.

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## INTRODUCTION

A caesarean section (CS) is a life-saving surgical procedure when certain complications arise during pregnancy and labour. However, it is a major surgery and is associated with immediate maternal and perinatal risks and may have implications for future pregnancies as well as long-term effects that are still being investigated.<sup>1-3</sup> For most anaesthesiologists, the clinical experience with general anaesthesia for caesarean section is very low. General anaesthesia is mostly performed for emergency grade 1 caesarean section and due to a lack of time to apply a neuraxial anaesthesia technique.<sup>4,5</sup>

Spinal anesthesia is a safe and effective anesthetic technique for cesarean section, considering its simplicity, rapidity, accompanied maternal awareness and distribution of anesthetic agents.<sup>6</sup> Epidural anaesthesia is known to be able to induce anaesthesia without causing a sudden cardiovascular change in the case of haemodynamic instability, while spinal anaesthesia is easier and faster than epidural anaesthesia and allows a reduction of anaesthesia-induction time.<sup>7,8</sup>

Hence; we planned the present study to assess and compare the efficacy of spinal and epidural anesthesia in patients in undergoing cesarean section.

## MATERIALS & METHODS

The present study was conducted in the Department of Anaesthesiology, PGIMER, Chandigarh, India.

It included assessment and comparison of the efficacy of spinal and epidural anesthesia in patients in undergoing cesarean section.

Ethical approval was obtained from the institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 30 patients scheduled to undergo CS were included in the present study and were broadly divided into two study groups with 15 patients in each group as follows:

**Group 1:** Patients undergoing CS under spinal anesthesia,

**Group 2:** Patients undergoing CS under General anesthesia

Hypertensive patients, diabetic patients and patients with any known drug allergy or with history of presence of any other co-morbid condition were excluded from the present study. Pulse oximetry and ECG were used for intraoperative monitoring. Complete demographic details of all the patients were obtained. Spinal anesthesia was administered to patients of group 1 and epidural anesthesia was given to patients of group 2. Time from

administration of anesthesia to the time of surgical anesthesia was denoted as AS time and was recorded in all the patients. VAS (visual analogue score) was recorded in all the patients one day after surgery.

All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi- square test was used for assessment of level of significance.

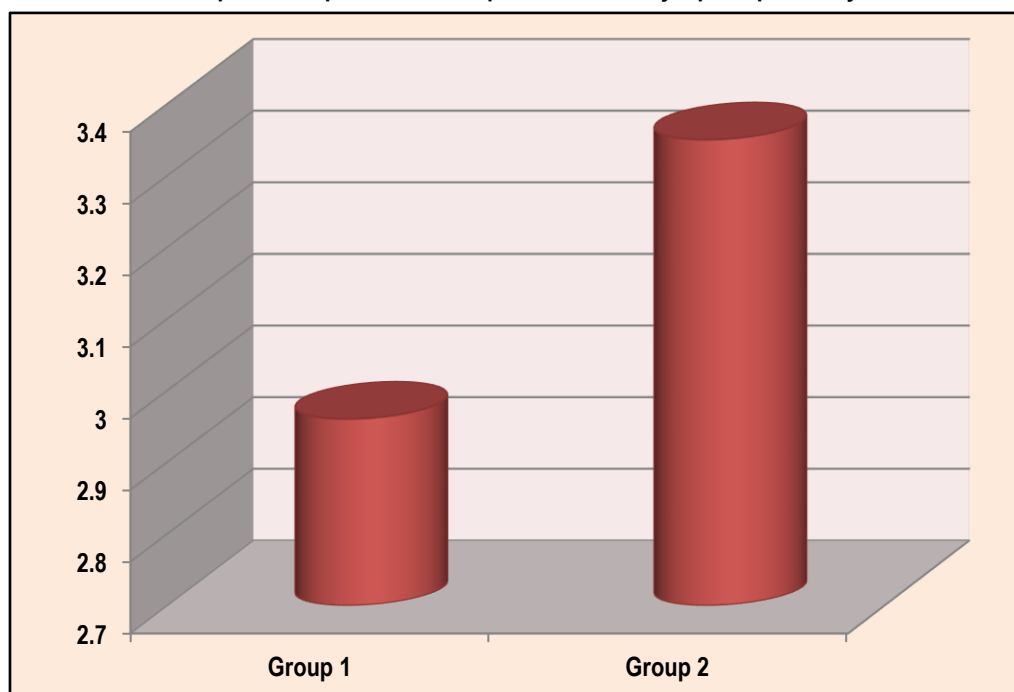
**Table 1: Demographic and clinical data**

Parameter	Group 1	Group 2	P-value
Mean age (years)	36.5	35.8	0.81
Mean weight (Kg)	74.6	73.9	0.56
Mean height (cm)	158.3	157.9	0.69

**Table 2: Comparison of variables between both the study groups**

Parameter	Group 1	Group 2	P- value
AS time (minutes)	21.5	26.41	0.02*
Total anesthetic time (minutes)	85.6	91.4	0.01*
VAS pain score on day 1 postoperatively	2.96	3.35	0.58

**Graph 1: Comparison of VAS pain score on day 1 postoperatively**



**RESULTS**

In the present study, we analyzed 15 patients undergoing CS under spinal anesthesia and 15 patients undergoing CS under epidural anesthesia. Mean age of the patients of group 1 and group 2 was 36.5 years and 35.8 years respectively. Mean weight of the patients of the group 1 and group 2 was 74.6 and 73.9 Kg respectively. Mean AS time among subjects of group 1 and group 2 was 21.5 and 26.41 minutes respectively. Significant results were obtained while comparing the mean AS time in between subjects of group 1 and group 2. Mean total anesthesia time among subjects of group 1 and group 2 was 85.6 and 91.4 minutes respectively. Significant results were obtained while

comparing the mean total anesthetic time in between subjects of both the study group. Mean VAS pain score on day 1 postoperatively was 2.96 and 3.35 among subjects of group 1 and group 2 respectively. However; on comparing the VAS score in between the two study groups, non- significant results were obtained.

**DISCUSSION**

In the present study, mean age of the patients of group 1 and group 2 was 36.5 years and 35.8 years respectively. Mean weight of the patients of the group 1 and group 2 was 74.6 and 73.9 Kg

respectively. Van de Velde M et al evaluated 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 (26 women were severely pre-eclamptic and 51 demonstrated mild pre-eclampsia). 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.<sup>9</sup>

In the present study, mean AS time among subjects of group 1 and group 2 was 21.5 and 26.41 minutes respectively. Significant results were obtained while comparing the mean AS time in between subjects of group 1 and group 2. Mean total anesthesia time among subjects of group 1 and group 2 was 85.6 and 91.4 minutes respectively. Significant results were obtained while comparing the mean total anesthetic time in between subjects of both the study group.

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. The A to S time and the entire anaesthetic time were longer for epidural anaesthesia than for spinal anaesthesia.<sup>10</sup>

In the present study, Mean VAS pain score on day 1 postoperatively was 2.96 and 3.35 among subjects of group 1 and group 2 respectively. However; on comparing the VAS score in

between the two study groups, non-significant results were obtained. Ng K et al assessed the relative efficacy and side-effects of spinal versus epidural anaesthesia in women having caesarean section. The Cochrane Pregnancy and Childbirth Group Trials Register (February 2003) and the Cochrane Central Register of Controlled Trials (The Cochrane Library, Issue 1, 2003) were searched. Types of studies considered for review include all published randomised controlled trials involving a comparison of spinal with epidural anaesthesia for caesarean section. Two reviewers independently assessed trials for inclusion. Review Manager software was used for calculation of the treatment effect represented by relative risk (RR) and weighted mean difference (WMD) using a random effects model with 95% confidence intervals (CI). Ten trials (751 women) met our inclusion criteria. No difference was found between spinal and epidural techniques with regards to failure rate, need for additional intraoperative analgesia, need for conversion to general anaesthesia intraoperatively, maternal satisfaction, need for postoperative pain relief and neonatal intervention. Women receiving spinal anaesthesia for caesarean section showed reduced time from start of the anaesthetic to start of the operation, but increased need for treatment of hypotension. Both spinal and epidural techniques are shown to provide effective anaesthesia for caesarean section.<sup>11</sup>

## CONCLUSION

From the above results, the authors conclude that both spinal and epidural anesthesia were equally effective in patients undergoing CS. However; in terms of time duration for attainment of anesthesia, epidural anesthesia was associated with significantly longer time duration.

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