

Prevention of Post Spinal Anaesthesia Hypotension in Caesarean Delivery using Delayed Supine Positioning- A Randomized Controlled Trial StudyRohit Garg¹, Praveen Kumar Singh², Krishna Kumar³¹Senior Resident, Department of Anesthesia & Critical Care, Icare Institute of Medical Sciences & Research and Dr. Bidhan Chandra Roy Hospital, Haldia, India²Senior Resident, Department of Anesthesia & Critical Care, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India³Assistant Professor & HOD, Department of Anesthesia & Critical Care, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India

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Abstract:

This study examined the effectiveness of delaying supine positioning to prevent low blood pressure after spinal anaesthesia during caesarean deliveries. Carried out at Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, between January 2020 and January 2022, the research included 70 individuals who were divided into two groups. In the study, the group that waited for 10 minutes before transitioning to a supine position after spinal anaesthesia experienced a notable decrease in the occurrence of low blood pressure and the requirement for vasopressors, in comparison to the group that immediately assumed a supine position. Based on the findings, it appears that adopting a delayed supine positioning strategy can be a beneficial and feasible approach in mitigating anaesthesia-induced hypotension. This approach can help ensure the safety of mothers without any adverse effects on other factors such as neonatal Apgar scores or nausea. The findings discussed here have important implications for enhancing clinical protocols in caesarean deliveries.

Keywords: Cesarean Delivery, Spinal Anesthesia, Hypotension, Delayed Supine Positioning.

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Introduction

Low blood pressure is a frequent and important issue that can arise from spinal anaesthesia during caesarean deliveries, impacting the well-being of both the mother and the baby [1]. The decrease in blood pressure is mainly caused by the inhibition of the sympathetic nerves, resulting in the widening of blood vessels and reduced blood flow back to the heart. These side effects can include feelings of sickness, lightheadedness, and in more serious situations, reduced blood flow to the placenta and distress to the unborn baby [2,3]. Several approaches have been investigated to address this problem, including the use of fluid preloading, vasopressor administration, and mechanical techniques like leg wrapping. Nevertheless, these methods come with their own set of limitations and varying levels of effectiveness. As a result, there is a constant search for new methods to improve the safety and comfort of patients [4,5].

An alternative method involves having the patient lie on their back for a period of time after receiving spinal anaesthesia [6]. This method requires keeping the pregnant woman in a sideways or partially reclined position for a certain amount of time before moving her to a flat position. This

method aims to prevent the sudden onset of vasodilation and pooling of blood in the veins that often happens when lying flat. By doing so, it allows for a gradual adjustment and helps maintain more stable hemodynamics [7,8].

This study seeks to examine the efficacy of delayed supine positioning in preventing hypotension after spinal anaesthesia during caesarean deliveries. The research design involves a randomised controlled trial to gather data and draw conclusions. This study aims to provide empirical evidence on the potential benefits of this technique by comparing the incidence of hypotension and the need for vasopressor support between the intervention and control groups. These findings have the potential to greatly influence clinical practice, providing a simple and cost-effective approach to enhance the outcomes for both mothers and babies during caesarean sections performed under spinal anaesthesia.

Methodology

Study Design: This study is a randomized controlled trial designed to evaluate the effectiveness of delayed supine positioning in

preventing hypotension following spinal anesthesia in cesarean deliveries.

Setting: The research is conducted at Sri Krishna Medical College and Hospital in Muzaffarpur, Bihar.

Duration: The study spans from January 7, 2020, to January 31, 2022.

Participants: A study includes a group of pregnant women who have planned caesarean deliveries under spinal anaesthesia. The total number of participants ranges from 50 to 80. Criteria for inclusion involve a gestational age of over 37 weeks, a pregnancy with only one foetus, and the absence of any factors that would make spinal anaesthesia unsafe. Patients who have pre-existing hypertension, cardiovascular disorders, or any condition that contraindicates the use of spinal anaesthesia are excluded from the study.

Randomization and Blinding: Participants are assigned at random to either the intervention group or the control group. The intervention group receives delayed supine positioning, while the control group is positioned right away in the supine position after spinal anaesthesia. Randomization is performed using computer-generated random numbers to ensure fair and impartial allocation. The study is conducted in a manner where participants are unaware of the group allocation, ensuring unbiased results.

Intervention: In the intervention group, participants are maintained in a lateral decubitus position for 10 minutes post-spinal anesthesia before being repositioned to the supine position. The control group is repositioned to the supine position immediately after the administration of spinal anesthesia.

Outcome Measures: The main focus is on the occurrence of hypotension, which is characterised by a significant drop in systolic blood pressure, either by 20% or more from the initial reading or reaching a systolic blood pressure below 90 mmHg within 15 minutes after spinal anaesthesia. Additional outcomes encompass the requirement

for vasopressors, occurrence of nausea and vomiting, and neonatal outcomes like Apgar scores at 1 and 5 minutes.

Data Collection: Data are collected on demographic characteristics, medical history, details of anesthesia, and intraoperative monitoring. Blood pressure is measured at baseline, immediately after positioning, and every 2 minutes thereafter for 20 minutes.

Statistical Analysis: Analysis of the data is conducted using SPSS software. Baseline characteristics can be summarised using descriptive statistics. The occurrence of low blood pressure and other results are compared between the two groups using statistical tests appropriate for categorical and continuous variables. A p-value below 0.05 is deemed to have statistical significance.

Results

The study included a total of 70 participants, with 35 assigned to the intervention group (delayed supine positioning) and 35 to the control group (immediate supine positioning). The baseline characteristics of both groups showed similarities in terms of age, gestational age, and body mass index. There was a notable decrease in the occurrence of low blood pressure in the intervention group when compared to the control group. A smaller number of participants in the intervention group needed vasopressors in comparison to the control group. There was no notable disparity in the occurrence of nausea and vomiting among the two groups. The neonatal outcomes, as assessed by the Apgar scores at 1 and 5 minutes, showed no significant differences between the groups. According to the study, adopting a delayed supine positioning technique has been shown to have a significant impact on reducing the occurrence of hypotension and the requirement for vasopressors during caesarean deliveries performed under spinal anaesthesia. These findings indicate that this straightforward, affordable intervention could be integrated into clinical practice to improve maternal safety and comfort.

Table 1: Baseline Characteristics of Participants

Characteristic	Intervention Group (n=35)	Control Group (n=35)	p-value
Age (years)	26.3 ± 4.5	25.9 ± 4.7	0.74
Gestational Age (weeks)	38.7 ± 1.2	38.5 ± 1.3	0.65
BMI (kg/m ²)	27.1 ± 3.2	27.4 ± 3.1	0.70

Table 2: Incidence of Hypotension

Group	Participants with Hypotension	Total Participants	Percentage
Intervention Group	8	35	22.9%
Control Group	20	35	57.1%
p-value			0.02

Table 3: Need for Vasopressors

Group	Participants Needing Vasopressors	Total Participants	Percentage
Intervention Group	6	35	17.1%
Control Group	18	35	51.4%
p-value			0.01

Table 4: Secondary Outcomes

Outcome	Intervention Group (n=35)	Control Group (n=35)	p-value
Nausea and Vomiting (%)	31.4%	34.3%	0.75
Apgar Score at 1 min (mean)	8.9 ± 0.3	8.8 ± 0.4	0.44
Apgar Score at 5 min (mean)	9.7 ± 0.2	9.6 ± 0.2	0.37

Discussion

The findings of this randomised controlled trial highlight the effectiveness of delayed supine positioning in reducing the occurrence of hypotension after spinal anaesthesia in caesarean deliveries [9]. Remarkably, the group receiving the intervention showed a significant decrease in the requirement for vasopressors, emphasising the potential of this straightforward intervention to improve patient safety and alleviate the strain on healthcare resources [10,11].

It is believed that the reason behind this advantage is the prevention of sudden widening of blood vessels and the subsequent rapid drop in blood pressure that often occurs when patients are quickly transitioned to a lying down position after receiving spinal anaesthesia [12]. Through the postponement of this repositioning, our method enables a slower hemodynamic adjustment, providing the body with sufficient time to adapt to the alterations caused by the anaesthesia [13,14]. This discovery aligns with earlier research that has indicated the advantages of adjusted positioning for addressing anaesthesia-induced low blood pressure. However, it offers a more targeted and applicable strategy specifically designed for caesarean deliveries. Although the intervention did not have a significant effect on the rates of nausea and vomiting or neonatal outcomes like Apgar scores, its primary advantage in terms of

preventing hypotension is of great importance in a clinical context. Low blood pressure can cause discomfort for the patient and potentially result in more serious complications for both the mother and baby if not properly addressed [15,16].

Nevertheless, this study does have some limitations. The sample size, although sufficient for detecting variations in hypotension and vasopressor use, might still be insufficient for thoroughly investigating secondary outcomes such as nausea or subtle differences in neonatal outcomes [17]. In addition, the findings of this study may have limited applicability to diverse populations and settings due to its single-center design. Additional research is required in various settings with larger populations to validate these findings and potentially investigate the consequences of delayed supine positioning on other relevant outcomes [18]. Our research indicates that adopting a delayed supine positioning approach can be a practical and advantageous method for mitigating hypotension during caesarean deliveries conducted under spinal anaesthesia. This technique has the potential to greatly enhance current protocols, particularly in situations where there are limited resources available for managing hypotension [19,20].

Conclusion

In this study, it was found that adopting a delayed supine positioning technique can effectively

decrease the occurrence of hypotension after spinal anaesthesia in caesarean deliveries. This approach also reduces the requirement for vasopressors. The results of this study provide strong evidence for the adoption of delayed supine positioning in clinical settings. This approach is not only easy to implement and cost-effective, but it also has the potential to significantly improve maternal safety and overall outcomes. Although the effects on secondary outcomes such as nausea and Apgar scores were not found to be significant, the primary advantages in terms of cardiovascular stability are quite substantial. Further research should focus on confirming these findings in larger and more diverse groups of people and investigating the wider implications of this intervention in addressing complications associated with spinal anaesthesia.

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