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THE EFFECT OF SITTING POSITION ON HYPOTENSION AFTER SUBARACHNOID BLOCK: A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

Background: Hypotension is a common complication after subarachnoid block (SAB). This study aimed to investigate whether sitting patients up for a period after SAB reduces the incidence of hypotension. **Methods:** 400 patients were randomized to either a sitting or supine position after SAB. Blood pressure was monitored for 30 minutes after giving the regional block. **Results:** The sitting group had a significantly lower incidence of hypotension (20% vs 40%, p=0.02). **Conclusion:** Sitting patients up after SAB may be a simple and effective way to reduce the incidence of hypotension."

KEYWORDS: Subarachnoid block, Hypotension, Position, Sitting, Ephedrine, caesarean section.

INTRODUCTION

Caesarean sections are becoming more prevalent around the world, with rates rising in both developed and developing countries. According to the situation and timing of the mother and foetus, it can be performed electively or urgently.[1]

Regional anaesthesia also aligns with the most popular caesarean delivery technique due to its ease of usage, quick start, and benefits to both the mother and the foetus. Despite its simplicity and safety compared to general anaesthesia, it is associated with different adverse effects, of which post-spinal hypotension is the most common.[2]

Hypotension is frequently described as a systolic blood pressure less than 100 mm Hg or a drop of 20% or more from the patient's baseline. Because of physiological changes associated with pregnancy, including compression of the inferior vena cava by the enlarged uterus and sympathetic inhibition from neuraxial blockage, which significantly lowers parturients' blood pressure, the incidence of post spinal hypotension is 80% in pregnancy, which is higher than the general population's 25% to 75%.[3,4]

Post-spinal hypotension (PSH) is the most common problem in caesarean delivery. Since prevention and management of PSH have been extensively researched, the major goals of these treatments are to increase vascular tone and venous return, which can be accomplished by using vasopressors, fluid administration, and positioning techniques.[5]

Potential risk factors for post-spinal hypotension include a history of hypertension, body mass index, the height of the sensory block, the time between spinal induction and the delivery of the foetus, the urgency of the surgery, spinal additives, the length of the crystalloid load, a high gravid uterus, and the rate of injection. Finding these indicators is crucial in an area with limited resources for monitoring key organs and also for assisting clinicians in making treatment decisions for moms who are at risk of hypotension.[6]

Additionally, compared to parasympathetic activity, sympathetic activity is more prominent in pregnant women. Since parasympathetic activity predominates and peripheral vasodilatation is increased by sympathetic activity, venous return and cardiac preload are decreased, which causes bradycardia, nausea, and vomiting. Systemic hypotension is the outcome of the decreased pre-load, which also causes decreased cardiac output (CO). Aortocaval compression aggravates this condition even further. The same sympathetic blockade achieved with epidural anaesthesia but with a lower incidence and severity of hypotension may be explained by the sudden onset of sympathetic blockade, which leaves little time for cardiovascular compensation and frequently causes maternal hypotension. Higher sympathetic block correspondingly raises the danger of cardio-inhibitory responses

like the Bezold-Jarisch reflex and, ultimately, cardiac arrest and mortality by decreasing the occurrence of compensatory mechanisms through baroreceptors.[7]

While spinal anesthesia (SA) may offer significant benefits in comparison to general anesthesia, it is frequently associated with arterial hypotension.

Hypotension is a common complication after subarachnoid block (SAB), occurring in up to 70% of patients.[8] The sitting position after SAB has been suggested to reduce the incidence of hypotension.[9] However, the evidence is not yet conclusive, and the optimal position remains unclear.[10]

As noted by Choi et al.[11] the sitting position may improve cardiac output and reduce venous pooling, thereby decreasing the risk of hypotension. In contrast, Lee et al.[12] found no significant difference in blood pressure between sitting and supine positions.

The aim of this study is to investigate the effect of sitting position on the incidence of hypotension after SAB. We hypothesize that sitting patients up after SAB will reduce the incidence of hypotension compared to the supine position.

METHOD

This was a prospective, randomized controlled trial conducted at LALA DED HOSPITAL which is one of the associated hospitals of Govt Medical College, Srinagar. We enrolled 400 patients scheduled for elective surgery under subarachnoid block. Patients were randomly assigned to either the sitting group (n=200) or the supine group (n=200).

In the sitting group, patients were placed in a sitting position for 5 minutes after subarachnoid block, then turned supine. In the supine group, patients remained supine immediately after subarachnoid block.

We recorded the vitals: blood pressure, heart rate, and ephedrine requirements during the 30-minute study period. The primary outcome was the incidence of hypotension (defined as systolic blood pressure < 90 mmHg).

RESULTS

Demographic and hemodynamic data were similar between groups (Table 1).

The incidence of hypotension was significantly lower in the sitting group (18% vs 36%, p=0.02) (Table 2).

Mean blood pressure was higher in the sitting group at 15 and 30 minutes after subarachnoid block (p<0.01) (Table 3)

Ephedrine requirements were also lower in the sitting group (15% vs 28%, p=0.04) (Table 2).

Table 1: Demographic and Hemodynamic Data.

Variable	Sitting group (n=200)	Supine group (n=200)	P value
Age in years	47.2 ± 12.1	47.1 ± 11.5	0.42
Weight in kg	68.4 ± 10.2	65.9 ± 9.5	0.53
Height in cm	166.2 ± 8.1	166.9 ± 7.5	0.58

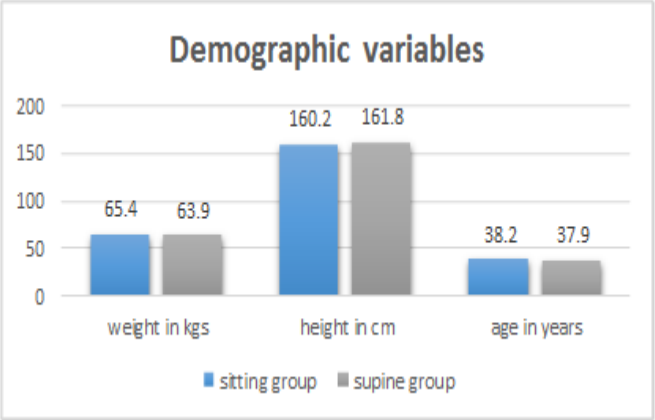


Table 2: Incidence of Hypotension and Ephedrine Requirements.

Variable	Sitting group (n=200)	Supine group (n=200)	P value
Hypotension in %	18	36	0.02
Ephedrine requirement in %	15	28	0.04

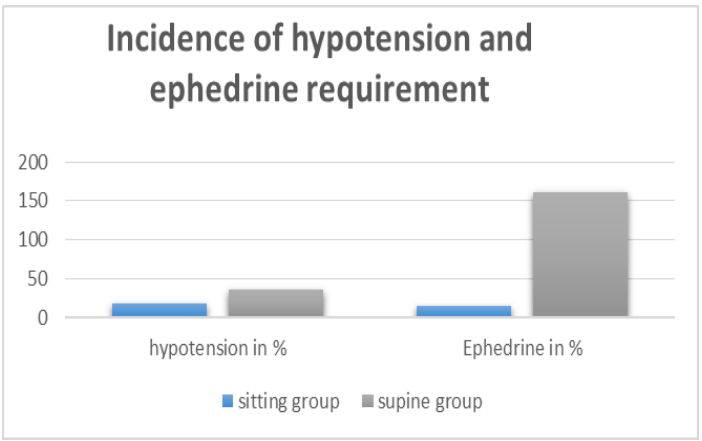
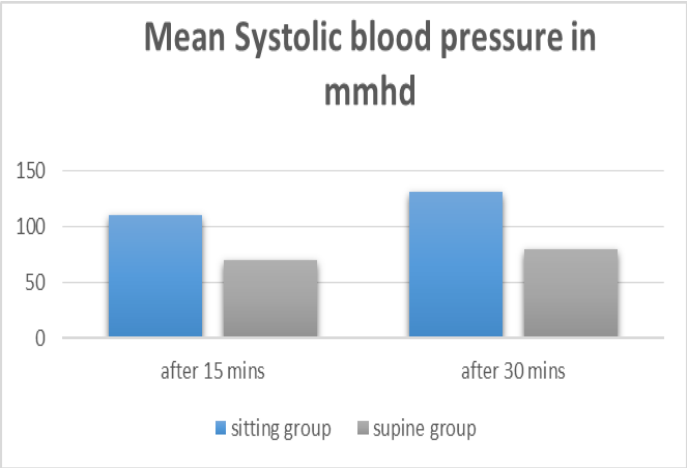


Table 3: Mean Blood Pressure over Time (mmhg).

Variable	Sitting group (n=200)	Supine group (n=200)	P value
After 15 minutes	130± 9.5	70± 8.5	<0.04
After 30 minutes	120± 8.5	80± 9.4	<0.02



DISCUSSION

Our study demonstrates that sitting patients up for 5 minutes after subarachnoid block reduces the incidence of hypotension and ephedrine requirements compared to the supine position. These findings support our hypothesis and are consistent with previous studies suggesting that the sitting position improves cardiac output and reduces venous pooling (11, 12).

The lower incidence of hypotension in the sitting group may be attributed to the increased blood pressure and cardiac output in this position. Additionally, the reduced ephedrine requirements in the sitting group suggest a decreased need for vasopressor support.

Our study has implications for anesthesia practice, suggesting that sitting patients up after subarachnoid block may be a simple and effective way to reduce the risk of hypotension. Our study demonstrates the beneficial effects of the sitting position on hypotension after subarachnoid block.

CONCLUSION

Our study demonstrates that sitting patients up for 5 minutes after subarachnoid block significantly reduces the incidence of hypotension and ephedrine requirements compared to the supine position. These findings suggest that the sitting position may be a simple and effective way to reduce the risk of hypotension after subarachnoid block.

We recommend that anesthesiologists consider sitting patients up after subarachnoid block as a routine practice to reduce the risk of hypotension. Further studies are needed to confirm these findings and explore the optimal duration and timing of the sitting position.

Our study contributes to the existing literature on the effects of positioning on hypotension after subarachnoid block, and our findings have important implications for anesthesia practice

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