

**TO COMPARE THE NEED FOR INTRAVENOUS VASOPRESSOR (RESCUE) THERAPY FOR TREATING SPINAL ANAESTHESIA INDUCED HYPOTENSION AMONG PHENYLEPHRINE, EPHEDRINE AND CONTROL GROUPS.**

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**Abstract**

The study was undertaken in the Department of Anaesthesiology, Gajra Raja Medical College, Gwalior. The study included 90 patients (age 20-35 years) undergoing elective caesarean section under spinal anaesthesia.

Maximum hypotension was observed in control group. As compared to the control group, incidence of hypotension was significantly less in phenylephrine group as well as ephedrine group. Also comparing ephedrine and phenylephrine groups, although incidence of hypotension was low in phenylephrine group but it was not found to be significant.

The incidence of hypotension was significantly low in phenylephrine group (p=0.000) and ephedrine group (p=0.005). But when phenylephrine and ephedrine groups were compared, although incidence of hypotension was low in phenylephrine group but it was not found to be significant (p=0.869).

**Keywords:** Intravenous Vasopressor, Spinal Anaesthesia, Hypotension & Phenylephrine.

**Introduction**

Hypotension is associated with distressing symptoms of dizziness, nausea and vomiting, and may also interfere with the surgical procedure<sup>1</sup>. Ideally hypotension should be prevented in patients receiving spinal anaesthesia<sup>2</sup>. Various drugs and methods like preloading with intravenous fluids (crystalloids/colloids), ephedrine, mephentermine and even intrathecal ketamine had been studied to prevent hypotension during spinal anaesthesia with varying success. Prophylactic intravenous hydration has been used as first line measure to prevent hypotension although the place of preloading is now being questioned<sup>3</sup>. The management of choice, however, if hypotension occurs is the use of vasopressors as required.

The usual approach to the use of vasopressors in this clinical setting is reactive rather than proactive; spinal anaesthesia induced hypotension is allowed to develop and is then treated accordingly. Given the frequency with which it occurs, a more logical approach to its prevention may be the administration of pre-emptive vasopressors. Intramuscular (IM) ephedrine 37.5 mg has been found to be associated with a persistently high incidence of hypotension<sup>4</sup>. The effect of ephedrine 45 mg IM has been found to be safe<sup>5</sup>. IM phenylephrine for the prevention of hypotension has been safely given to healthy volunteers, including the elderly, in doses of 0.15 mg/kg (up to 10 mg)<sup>6,7</sup>.

**Material Method**

The study was undertaken in the Department of Anaesthesiology, Gajra Raja Medical College, Gwalior from July 2018 to June 2019. The study included 90 patients (age 20-35 years) undergoing elective caesarean section under spinal anaesthesia. Pre-anaesthetic check-up was done in all the patients which includes:

1. Elucidating history of diabetes, hypertension, asthma, tuberculosis, previous cardiovascular or central nervous system abnormalities, drug allergy, previous surgery, or any other significant history.
2. Examination including pulse, blood pressure, cardiovascular examination, respiratory system examination, spinal abnormalities, other systems.
3. Investigations including haemoglobin, complete blood counts, serum electrolytes, INR, blood sugar, serum urea, serum creatinine, chest X-ray, ECG as and when applicable.

**Informed consent was obtained from each patient.**

**INCLUSION CRITERIA**

1. Woman of age between 20-35 years
2. ASA grade I or II
3. Undergoing elective caesarean section.

**EXCLUSION CRITERIA**

1. Known hypertensive or those with a resting arterial pressure more than 130/90 mmHg.
2. Patient with hypovolemia or hypotension

3. Patients with diabetes, respiratory disease, cardiac disease, epilepsy.
4. Height less than 150 cm
5. Allergic to any drug to be used
6. Any other contraindication for spinal anaesthesia

## Results

**Table 1:** Demography of each age group of patients

Age group (yrs)	Group C	Group E	Group P
20-25	20	19	20
26-30	10	9	10
31-35	0	2	0
TOTAL	30	30	30

Hypotension = decrease in MAP by >25% of baseline MAP

**Table 2:** Incidence of hypotension among the three groups

	Group C	Group E	Group P
No.(n) of patients with hypotension	19	8	5
Percentage of patients with hypotension	63	26	16

**Table 3:** Comparison of various groups with respect to incidence of hypotension

	Group C & E	Group C & P	Group E & P
p value	0.005	0.000	0.351
Significance	Significant	Significant	Not significant

Maximum hypotension was observed in control group. As compared to the control group, incidence of hypotension was significantly less in phenylephrine group as well as ephedrine group.

Also comparing ephedrine and phenylephrine groups, although incidence of hypotension was low in phenylephrine group but it was not found to be significant.

## Discussion

The mechanism by which spinal anaesthesia causes hypotension has been discussed above. Ephedrine causes restoration of blood pressure mainly by increasing heart rate and contractility (direct  $\beta$ -agonist activity) and also by producing some vasoconstriction (indirect effect) (Critchley LAH et al 1995)<sup>8</sup>. Phenylephrine on the other hand, has predominant  $\alpha$ -agonistic activity and restores the blood pressures by virtue of arterial as well as venous vasoconstriction, leading to increase in both systemic vascular resistance and venous return to the heart.

Hypotension in this study was taken as decrease in MAP by >25% of baseline MAP. Episodes of hypotension were mainly observed 5-10 minutes after administration of

spinal anaesthesia. Few patients developed hypotension up to 25-30 minutes post spinal administration<sup>9</sup>.

It was observed that incidence of hypotension was significantly less in phenylephrine (16%) and ephedrine (26%) groups as compared to control group (63%) ( $p < 0.05$ ). Comparing the incidence of hypotension in phenylephrine group and ephedrine group, although incidence of hypotension was low in phenylephrine group but it was not found to be significant. ( $p = 0.351$ )

In the study done by Ayorinde BT et al (2001)<sup>5</sup>, they found that incidence of hypotension was significantly less in phenylephrine 4mg (33%) as compared to control group (70%). Also they found that incidence of hypotension in phenylephrine 4 mg group was 33% as compared to ephedrine 45 mg which had an incidence of 48%, and this difference was not significant statistically.

Our study have also showed similar results in the incidence of hypotension in phenylephrine group (16%) as compared to ephedrine group (26%) ( $p = 0.351$ )

## Conclusion

All the patients who developed hypotension, nausea, vomiting were given 6 mg ephedrine IV bolus (rescue ephedrine).

The incidence of hypotension was 16% in phenylephrine group, 26% in ephedrine group and 63% in control group. The incidence of hypotension was significantly low in phenylephrine group ( $p = 0.000$ ) and ephedrine group ( $p = 0.005$ ). But when phenylephrine and ephedrine groups were compared, although incidence of hypotension was low in phenylephrine group but it was not found to be significant ( $p = 0.869$ ).

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