

# OPTIMAL PROPHYLACTIC IV EPHEDRINE DOSE DURING CAESAREAN SECTION TO PREVENT SPINAL-INDUCED HYPOTENSION

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**Abstract**—Spinal anesthesia is a popular technique used for lower limb surgeries & Lower segment cesarean section, it is the safest procedure than general anesthesia, but it causes hypotension due to vasodilatation. To tackle the hypotension, IV fluids & vasopressors were used. This study concludes that a prophylactic dose of IV ephedrine of 10mg-15 mg is enough to combat hypotension.

**Keywords**—Spinal anesthesia, hypotension, ephedrine.

## I. INTRODUCTION:

**Spinal anaesthesia:** Spinal anesthesia is a simple technique that provides a deep and fast surgical block by injecting small doses of local anesthetic solution into the subarachnoid space. [1]. It is the most common and safest procedure used for a caesarean section as compared to General anesthesia because it has significantly fewer side effects than general anesthesia, e.g. (difficult intubation, risk of aspiration, trauma to the oral cavity). The most common side of Spinal anaesthesia is hypotension due to vasodilatation, which affects maternal & foetal events leading to foetal hypoxia, bradycardia & foetal acidosis. Prevention of spinal induced Hypotension can be done by the combination of preloading & vasopressors such as Ephedrine, Mephentermine & Phenylephrine for increasing arterial blood pressure and better preservation of uteroplacental blood flow.

## II. METHODS:

**Study Design:** The present prospective observational case-control study was conducted on 90 parturients scheduled for LSCS at SGT Medical College and hospital & research institute, Gurugram, India. The Institutional Ethics Committee approved this study of our institute. We did this study to find an optimal prophylactic iv ephedrine dose to prevent spinal-induced hypotension but cause fewer side effects like reactive hypertension.

**Exclusion criteria:** Parturients who are known cases of hypertension, pre-existing cardiac & pulmonary disease, any other Contraindication of spinal anesthesia was excluded

Three groups were made:

- Group - I received a 10mg IV bolus dose of prophylactic ephedrine
- Group - II received 15mg
- Group - III received 20mg

During the preoperative visit patient's detailed history, general physical examination, and systemic examination were carried out. Age and weight were recorded. Basic investigations like complete hemogram, random blood sugar, Prothrombin time, International normalized ratio, blood urea, serum creatinine, and Electrocardiogram were carried out. All patients were informed about anesthesia techniques and research study during a pre-anesthesia visit, and their written informed consent was taken.

Patients were kept nil orally for eight hrs. Before surgery. All the patients were preloaded with a 500 ml infusion of Ringer Lactate solution over 15-20min. Baseline pulse, systolic and diastolic blood pressure (SBP and DBP), and respiratory rate were recorded. Under all aseptic precautions, Spinal anesthesia was administered at the level of L3-4 or L4-5 interspaces, with 10 mg of bupivacaine 0.5% hyperbaric using a 25-gauge spinal Quincke's needle. Patients were then turned supine with 15 degree left lateral tilt of the operating table to prevent aortocaval compression.

The Bolus dose of prophylactic study medication was given IV immediately on turning the patient to the supine position from a prefilled syringe. All patients received 3-4 L/min of oxygen by facemask.

SBP < 20% of baseline was considered as hypotension.

SBP > 20% of baseline after administering the bolus dose of prophylactic ephedrine was considered reactive hypertension.

The following clinical parameters- were studied:

Cardio-respiratory parameters (PR, SBP, DBP, RR) were assessed

Frequency of Hypotension, reactive hypertension

Nausea & vomiting

Decrease in APGAR score

If hypotension occurred after a bolus dose of prophylactic ephedrine

Injection of 10mg ephedrine IV Bolus as rescue doses & IV crystalloid solutions were rushed to treat hypotension.

### STATISTICAL ANALYSIS:

All the relevant data was recorded on a specially designed proforma and were analyzed by SPSS version 11.

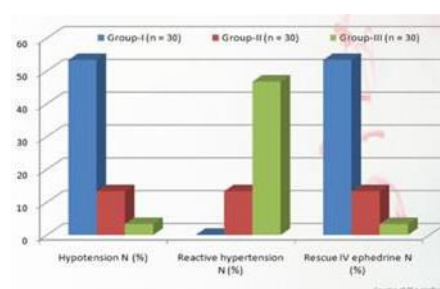
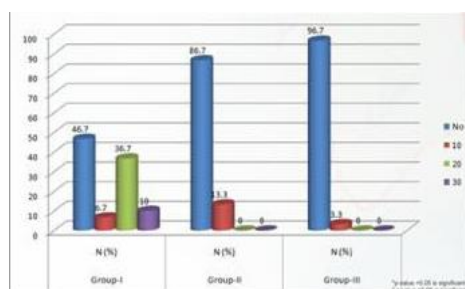
### III. RESULTS:

The incidence of reactive hypertension was

- Group-I- 0 %
- Group-II – 13.3%
- Group-III – 46.6 %

The incidence of nausea and vomiting was higher in group-I and was related to hypotension.

Furthermore, Group III had a significantly higher incidence of reactive hypertension.



### IV. Discussion:

Prophylactic ephedrine alone is at least as good as fluid preload in combating the hypotension associated with spinal anesthesia for cesarean section. This was also demonstrated by Datta et al. [2]. who compared parturients who were given ephedrine 10-30 mg as soon as any decrease in arterial pressure was detected with parturients in whom treatment with IV boluses of ephedrine 10 mg was withheld until hypotension occurred. They found that parturients who received ephedrine earlier had less nausea and vomiting and better neonatal acid-base status. There is no consensus about the dose of prophylactic IV ephedrine for prevention of spinal induced maternal Hypotension. Previously, Ngan Kee et al. suggested that ephedrine more than 20 mg was the most elective IV bolus dose to prevent hypotension, but had a high incidence of reactive hypertension. [3]. Some studies showed that low doses of prophylactic IV ephedrine significantly reduced the incidence of maternal hypotension. High doses of prophylactic IV ephedrine may be associated with significant side effects like reactive hypertension. Considering the risk and benefit ratio, a 15mg bolus dose of prophylactic IV ephedrine was optimal as it significantly reduced the incidence of maternal hypotension without increasing the incidence of reactive hypertension.

### V. CONCLUSION:

We conclude that the prophylactic use of ephedrine in a 15mg IV bolus significantly decreases the incidence of maternal hypotension without serious side effects like reactive hypertension. We suggest that 15mg is the optimal prophylactic /V ephedrine dose compared to higher doses, e.g., 20mg or more than 20mg, for preventing spinal-induced maternal hypotension during cesarean sections.

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**Conflict of Interest:** None declared.

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