



Anaesthesiology

COMPARISON OF THE EFFICACY OF PRELOAD VERSUS COLOAD OF CRYSTALLOID SOLUTION ON MATERNAL HYPOTENSION DURING SPINAL ANAESTHESIA IN CAESAREAN DELIVERY.

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ABSTRACT Spinal anaesthesia is the standard technique for elective caesarean section, but hypotension remains the main complication. This hypotension has detrimental effects on both mother and fetus. The intravenous fluid can be used both before and during spinal anaesthesia, the technique named as preload and afterload respectively. The incidence of hypotension, the total dose of ephedrine required, incidence of nausea and neonatal outcomes were evaluated. Crystalloid loading with 15ml/kg just after intrathecal injection compared to preload would be more effective in preventing maternal hypotension. The incidence of nausea was also lower in the coload group. Neonatal outcome measures were comparable between two groups.

KEYWORDS : Hypotension, Spinal anaesthesia, Crystalloid, Preload, Coload

Introduction:

August Bier (1898) introduced spinal analgesia in clinical practice. Since then, the technique has been widely practiced to provide anaesthesia, particularly for surgery below umbilicus. It has a very rapid onset and provides a dense neural block which can produce highly effective pain relief.

Cesarean section is the preferred mode of delivery in cases such as fetal distress, placenta previa, meconium stained liquor, primi breech, cephalopelvic disproportion (CPD) etc.

Due to its technical simplicity, rapid analgesia and relaxation, avoidance of general anaesthetics, postoperative pain relief, **spinal anaesthesia is the modality of anaesthesia unless contraindicated.**

However, **hypotension** is the most common complication of spinal anaesthesia. Hypotension is said to occur if the blood pressure falls to **>20% of baseline.** It is due to blockade of the sympathetic nerve fibers by the local anaesthetics leading to peripheral vasodilatation.

One of the established methods to prevent hypotension is fluid **preloading.** In the recent past, **coload** that is applying fluid loading at the time of administering the intrathecal local anaesthetic (coload) may be a more rational approach.

The present study was designed to test the hypothesis that rapid administration of crystalloids at the time of induction of spinal anaesthesia (coload) is associated with less hypotension than the rapid administration of an equivalent volume of crystalloid preload.

AIMS & OBJECTIVES:

Aim of the study is comparison of the efficacy of preload versus coload of crystalloid solution on maternal hypotension during spinal anaesthesia in cesarean delivery.

Objectives :

- To compare the degree of hypotension
- To compare the total dosage of vasopressor (IV Ephedrine) required
- To compare the neonatal outcome
- To compare intraoperative maternal complications.

MATERIALS AND METHOD:

Sixty parturients of American Society of Anaesthesiologists grade 1 or 2 and 18–35 years of age were divided into 2 groups.

- Group P (Pre-load group): n= 30 patients with ASA grade 1 or 2
- Group C (Co-load group): n=30 patients with ASA grade 1 or 2

A. INCLUSION CRITERIA:

- Parturient of ASA grade 1 and 2
- Age between 18-35 years
- Body weight between 50-80 kgs
- Elective caesarean section.

B. EXCLUSION CRITERIA:

- Parturient of ASA grade 3 and 4
- Age more than 35 years and less than 18 years
- Body weight more than 80 kgs and less than 50kgs
- Gestational age <37 weeks, Fetal distress, Pre-eclamptic or eclamptic patients
- H/o coagulation disorders
- Any cardiovascular disease, respiratory disease, diabetes mellitus and central nervous system diseases
- H/o adverse drug reactions.

OBSERVATION AND RESULTS :

In this study 60 patients aged 18-35 years, weighing 50-80 kg, each of ASA physical status I or II, were equally divided into 2 groups with 30 patients in each group.

Table 1: Incidence of Hypotension

	Group I (Preload) No. (%)	Group II (Coload) No. (%)
Incidence of occurrence of post spinal hypotension	15 (50.0 %)	5 (16.67 %)

Of the 60 patients, 20 were complicated by hypotension. The overall incidence of hypotension was 50% in group I, 16.67% in group II. So the incidence of hypotension was higher in group I.

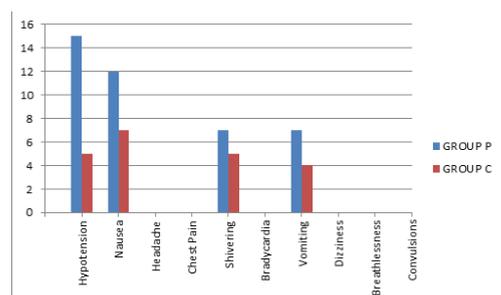
Table 2: Number of times ephedrine dose given (9 mg IV) in 2 groups:

	GROUP P	GROUP C	P VALUE	COMMENT
Ephedrine dose (Number of Times)	20 (66.67%)	5 (16.67%)	0.0015	Significant

Out of 30 Patients of preload group, 15 patients required injection Ephedrine to prevent hypotension and the total number of times injection ephedrine given is 20.

Out of 30 Patients of coload group, 5 patients required injection Ephedrine to prevent hypotension and the total number of times injection ephedrine given is 5.

Figure 1: Showing complications rate in 2 groups:



Nausea and vomiting both coinciding with hypotension is seen more in group P than in group C.

- Neonatal outcome was measured by Apgar scores and it is within normal range in both the groups.

CONCLUSION:

In our study, we found that when administering crystalloids for prevention of maternal hypotension after spinal anaesthesia for cesarean delivery, coload is more efficient than preload.

We also concluded that coload of crystalloid is more advantageous than preload because both the incidence of maternal hypotension and the amount of ephedrine used are lower in coload group.

The incidence of nausea is also lower in coload group and neonatal outcome was comparable between 2 groups.

So from our study we concluded that hydration with crystalloid is recommended to be done at the time of actual block (coload) rather than pre-hydration before the block (preload) in parturients undergoing spinal anaesthesia for cesarean delivery.

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