

## EFFICACY OF CRYSTALLOIDS AND COLLOIDS AS PRELOADING FLUIDS TO PREVENT HYPOTENSION IN SPINAL ANESTHESIA IN ELECTIVE C-SECTIONS

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### Abstract

**Background:** Different crystalloids commonly used in preloading are Ringer lactate, normal saline and colloids that are used in preloading are gelatin, dextran, hetastarch, pentastarch, tetrastarch. This study was aimed to compare the efficacy of both as preloading infusion to prevent hypotension, requirement of vasopressors and requirement of total fluid given during surgery to maintain stable hemodynamics

**Methods:** This randomized control trials was conducted in the Department of Anaesthesia , R.V.R.S. Medical College, Bhilwara. 60 patients between 18- 40 years of age, belonging to American society of anaesthesia grade I or II going for elective caesarian section under spinal anesthesia were screened for the study eligibility criteria

**Results:** In group (I), in 20 females, efficacy was achieved while in 10 females efficacy could not be achieved because of drop in BP. In group (II), in 22 females, efficacy was achieved while in 8 females, efficacy could not be achieved. The difference between both groups was statistically insignificant but there were more females in group II in which efficacy was achieved. (p-value=>0.05)

**Conclusion:** According to this randomized trial we did not find any significant difference between both groups for prevention of hypotension.

**Keywords:** Anesthesia, coload, hypotension, preload, spinal

### Introduction

Subarachnoid block is considered a safe regional anesthesia technique. This technique is widely used for both elective as well as emergency surgical procedures. It is a good anesthesia technique for surgeries like caesarean section, lower abdominal surgeries, lower limb orthopedic surgeries and urological procedures. Though spinal anesthesia has several advantages like excellent surgical analgesia, inhibits stress response, post operative analgesia, good skeletal muscle relaxation, airway instrumentation can be avoided, reduced chances of post operative deep vein thrombosis and pulmonary embolism. It has few disadvantages as well like, hypotension; post dural puncture headache, neurological damage etc. As far as hypotension is concerned, after the introduction of different vasopressors and intravenous fluids, spinal anesthesia has become relatively safe. Both crystalloids and colloids are used as preloading intravenous fluid before spinal anesthesia<sup>1</sup>.

Different crystalloids commonly used in preloading are Ringer lactate, normal saline and colloids that are used in preloading are gelatin, dextran, hetastarch, pentastarch, tetrastarch. This study was aimed to compare the efficacy of both as preloading infusion to prevent hypotension, requirement of vasopressors and requirement of total fluid given during surgery to maintain stable hemodynamics<sup>2</sup>.

### Material and Methods:

This randomized control trials was conducted in the Department of Anaesthesia , R.V.R.S. Medical college, Bhilwara. 60 patients between 18- 40 years of age, belonging to American society of anaesthesia grade I or II going for elective caesarian section under spinal anesthesia were screened for the study eligibility criteria

Inclusion criterion:

- Patient age more than 18 years
- Patient age less than 40 years
- American society of anaesthesia grade I or II

- Surgery going to be performed under spinal anesthesia.
- Had no history of hypertension or any cardiovascular disorder
- Had no liver or renal dysfunction,
- Had no contraindication to spinal anesthesia, and agreed to sign a written informed consent.

Exclusion criterion

- Known allergy to local anesthetics
- Patients of eclampsia and preeclampsia
- Known cases of hypertension, patients on anticoagulant therapy
- Known cases of thyrotoxicosis
- Known cases of severe stenotic valvular disease.
- Patients having infection i.e. bed sores or scabies at site of spinal injection, severe deformities of spine like scoliosis and kyphoscoliosis were excluded.

Patients were consecutively assigned into either group A (n=30) or group B (n=30) depending upon the preloading fluid used. Both the investigators and the subjects were blinded to the randomization, using closed envelop technique. After complete preoperative evaluation and thorough physical examination and necessary preoperative investigation, informed and written consent of patient was taken and baseline hemodynamic parameters were recorded.

Patients in the group A received 15ml/kg. Crystalloid (Ringer lactate) solution and those in the group B received 5 ml/kg colloid (gelofusin) in preloading.

Data was compiled and analyzed using SPSS-12. Descriptive statistics were employed to calculate the mean and standard deviation of age of patients. Efficacy (yes, no) was calculated as frequency and percentage. Efficacy was compared in both the groups by using Chi Square test. P value of <0.05 was considered as significant value.

Results

**Table 1: General parameters**

Parameters	Group-I	Group-II	p-value
Age	24.2±4.1	25.62±3.91	>0.05
ASA I:II	26:4	25:5	>0.05
Blood loss(ml)	310±110	315±120	>0.05

The patient characteristics like age, ASA, weight, ASA status, average blood loss were comparable among the two group.

**Table 2: comparison of efficacy achieved in both groups**

Efficacy	Group-I	Group-II
Yes	20(67.67%)	22(73.33%)
No	10(33.33%)	8(24.67%)

p-value= >0.05

In group (I), in 20 females, efficacy was achieved while in 10 females efficacy could not be achieved because of drop in BP. In group (II), in 22 females, efficacy was achieved while in 8 females, efficacy could not be achieved. The difference between both groups was statistically insignificant but there were more females in group II in which efficacy was achieved. (p-value=>0.05)

**Discussion**

Hypotension after spinal anaesthesia does not only cause inconvenience to the surgeon but the resulting nausea and vomiting may be distressing to the patient also. Hypotension in the parturient females if not treated timely and adequately may adversely affect the outcome of the fetus and mother<sup>3</sup>. Keeping in view the etiology of spinal hypotension preemptive measures focused on left lateral tilt infusing fluid before and at the time of giving spinal anaesthesia or using vasoconstrictive drugs to combat hypotension<sup>2</sup>. All these preventive and treatment modalities are known to prevent hypotension yet others have questioned the use of an agent and weighed its advantages against its adverse effects<sup>3</sup>.

Crystalloid preloading has been popularly used to prevent spinal hypotension.<sup>4</sup> Rout et al<sup>5</sup> in his study compared patients who were not preloaded with those who were preloaded .Incidence of hypotension in the un preloaded patients was 71% compared to 55% in preloaded patients.

Grace E park<sup>6</sup> and Rout found decreased incidence of hypotension with varying volume of ringer lactate, 10ml/kg-1 to 30 ml/kg-1 but, increasing the amount of fluid even further, could not decrease the incidence of hypotension as suggested by some studies<sup>7</sup>.

**CONCLUSION**

According to this randomized trial we did not find any significant difference between both groups for prevention of hypotension. Maximum number of patients in both groups had stable blood pressure.

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