

TO STUDY THE CONSEQUENCE OF ONDANSETRON ON HYPOTENSION INDUCED IN ASA 1 AND 2 PATIENTS ARRANGED FOR CAESAREAN SECTION UNDER SUB ARACHNOID BLOCK

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ABSTRACT

For conducting caesarean sections sub arachnoid blocks are shown to be an easy, safe, and most commonly followed anesthetics technique. Nonetheless its connotation with some side effects like perioperative hypotension, bradycardia nausea and vomiting can't be ignored. The majority of these side effects are induced by sympathetic blockade, hypovolemia and Bezold-Jarisch reflex through intra-cardiac serotonin (5HT₃) receptors and vague nerve. Various studies have already established the use of 5HT₃ antagonists like Ondansetron in preventing the serotonin induced BJR and thus peri-operative hypotension. In the present study, it was imagined by blocking type 3 serotonin receptors by intravenous (i.v.) ondansetron decreases the incidence of hypotension brought by spinal anesthesia

After procurement approval of recognized ethical group, and printed informed consent we conducted a study in 100 pregnant patients aged between 18-45 years with ASA 1 and 2 status planned for an elective caesarean section at term. This is a potential, randomized, measured, double blinded study. Group I (n=50) received 4 milligram ondansetron in 10 ml saline intravenously 5 mins before spinal puncture. Group II (n=50) received 10 ml saline in the same way and at the same timing. Patients in both the group I and II received 1000 ml of Ringers lactate solution over 30 minutes in the pre-operative room prior to induction of spinal anesthesia which was induced using 2.2 ml of 0.5% Bupivacaine heavy injected in intrathecal space in both the groups by same anesthesiologist. Standard ASA monitoring including, ECG, Pulse oximetry and NIBP was recorded in both the groups. Measurements of BP and heart rate (HR) was taken every 5 minutes for 60 minutes. Hypotension was defined as a reduction in mean arterial pressure (MAP) of more than 20%, and 3 mg of me phentermine was administered intravenously. Bradycardia was defined as a reduction in heart rate of more than 20%, and atropine 0.6 mg iv was administered intravenously.

Results Both groups are comparable in demographic. Statistically significant difference was noted in the Systolic Blood Pressures in both the groups at 0, 10, 20, 30, 40, 50 mins and 1-hour post sub arachnoid block. Requirement of vasopressor was significantly low in Group I 9 patients (18%) with a p=0.005 as compared to group II 32 (64%) patients

Conclusion: It was safely concluded that administering intravenous ondansetron prior to spinal puncture significantly depress the incidence of hypotension and requirement of vasopressors.

KEYWORDS: Ondansetron, hypotension, subarachnoid-block caesarean section

INTRODUCTION

Sub arachnoid blocks have been proved to be a straightforward, safe, and widely used anaesthetic procedure for performing caesarean sections around the world. Despite this, it has a link to potentially fatal adverse effects. Like perioperative hypotension, bradycardia can't be overlooked. Hypotension subsequently the onset of Sub Arachnoid Block is assumed to be produced either by decrease in systemic vascular resistance (SVR) or cardiac output (CO) or both which finally manifests as fall in Mean Arterial Pressure¹. Spinal-induced bradycardia is however multifactorial and the most common pathway postulated is over activity of parasympathetic nervous system, Bezold-Jarisch reflex (BJR), decreased SA nodal stretch reflex and Atrial Brain-bridge reflex. Association of BJR by chemoreceptors and mechanoreceptors that are serotonin complex has already been established in literature. Various studies have already established the use of 5HT₃ antagonists like Ondansetron in preventing the serotonin induced BJR and thus peri-operative bradycardia and hypotension². Although sub-arachnoid block May be a basic Also safe

procedure, uncommon difficulties for example, inert hypotension and bradycardia need aid genuine soporific tests Also Frequently troublesome on treat. Henceforth it is favored should forestall hypotension instead of treating it³. In the display study, it might have been guessed that blocking kind 3 serotonin receptors for intravenous (i. V.)ondansetron diminishes those frequency about hypotension prompted Toward spinal anesthesia. The reason for this prospective, randomized, twofold unseeing study might have been to think about those viability from claiming i. V. Ondansetron for An placebo over diminishing those frequency about hypotension created Toward spinal anesthesia Likewise elementary. outcome⁴.

MATERIAL AND METHODS

This potential randomized measured double-blind study is carried out at the Department of Anesthesiology and Critical Care, of a service hospital of Armed forces in the ASA I and II patients aged between 18-45 years planned for appointed caesarean at term from December 2017 to December 2018. A total of 100 subjects are comprised in the study⁵.

Study design: Prospective double blind randomized study

Study location: Tertiary care center of Armed Forces

Study duration: December 2017 to December 2018

Sample size: 100 patients

Subjects and selection method: After taking informed consent hundred patients aged 18 to 45 years and in ASA physical status ASA I and II, arranged for elective caesarean section at term are included in the study. The patients who volunteered in the study is arbitrarily allocated to one of the two clusters of 50 patients each in a double blinded manner to receive ondansetron or placebo⁶.

Exclusion criteria:

1. Patient refusal
2. Hypersensitivity to ondansetron
3. ASA physical status III or higher
4. Contraindication for sub arachnoid block
 - History of allergy to local anesthetics
 - Bleeding disorders
 - Mental disease
 - Infection at the site of injection
 - Unstable hemodynamics
 - Active infection/sepsis
 - Cardiac disease
5. Hypertensive disorders of pregnancy
6. Patients receiving SSRI or migraine medication.

PROCEDURE METHODOLOGY

After obtaining approval of Those regulate moral committee, composed educated assent might have been made starting with the patients included in the consider. Patients booked for elective cesarean segment were haphazardly allocated with whatever of the two aggregations gathering i (n=50) accepted ondansetron 4mg for 10 ml ordinary saline 05 mins in the recent past spinal cut Also one assembly ii (n=50) gained typical saline in the same lifestyle Furthermore during those same the long run. Those eyewitnesses might have been completely blind regarding those bunches alternately medications gained Toward those patients. Assembly sizes for 50 were dictated Toward control examination In view of standard deviation data⁷.

In the pre anesthesia room patients of both the groups received 1000 ml of Ringers Lactate solution over a period of 30 minutes. On patient arrival in the operation theater, standard ASA monitors are devoted and baseline vital parameters including pulse oximetry, noninvasive BP and ECG were recorded⁸.

Subarachnoid block was administered by a senior anesthesiologist in both the groups with The tolerant in the sitting position during those level for L3-L4 utilizing 2. 2 ml about 0.5 % hyperbaric bupivacaine following affirmation by cerebrospinal liquid allowed stream through 26-G spinal needle. The patients were put by recumbent position for 150 tablet tilts, furthermore tangible piece might have been evaluated of the misfortune for temperature sensation every 2 minutes for a period of 10 minutes. Patients whose sensory level loss was noted below level of T6 were excluded

from the study⁹.

Hemodynamic parameters including baseline heart rate, systolic BP, diastolic BP and MAP were recorded before administering the sub-arachnoid block and just after administering the block. These parameters were also sequentially recorded at an interval of 5 minute during intra operative period and at the primary hour subsequently surgery. Hypotension was clear as diminution of >20 % of mean arterial blood pressure and is treated by 3 mg bolus of me phentermine intravenously. Bradycardia was defined as a drop of >20 % of base line of heart rate or up to 45 beats per minute and is preserved by 0.6 mg of Inj. Atropine intravenously. Total dosage of me phentermine needed was recorded¹⁰.

Statistical analysis

Information were statistically portrayed As far as range, imply \pm SD, median, frequencies, Furthermore rates at proper. Examination of quantitative variables between the ponder Assemblies might have been finished utilizing those scholar t-test for free specimens. To analyzings unmitigated data, the chi square -test might have been performed. Fisher's correct p test might have been utilized At the expected recurrence might have been short of what 5. A p worth under 0. 05 might have been acknowledged statistically significant¹¹.

HAEMODYNAMICS OF STUDIED GROUP BEFORE SUB-ARACHNOID BLOCK			
HAEMODYNAMIC CHARACTERISTICS	GROUP A (N=50) (Mean \pm SD)	GROUP B (N=50) (Mean \pm SD)	P value
Heart Rate (beats/min)	92.18 \pm 19.64	90.52 \pm 12.84	0.2098
SBP (mmHg)	118.52 \pm 18.26	122.1 \pm 16.86	0.1718
DBP (mm Hg)	74.78 \pm 9.27	80.16 \pm 8.13	0.9083
Mean BP (mm Hg)	88.48 \pm 12.03	92.20 \pm 8.31	0.6708
SYSTOLIC BP OF STUDIED GROUP AFTER SUB-ARACHNOID BLOCK			
SBP (mm Hg)	GROUP A (N=50) (Mean \pm SD)	GROUP B (N=50) (Mean \pm SD)	P value
Just after	110.2 \pm 15.83	91.46 \pm 15.49	<0.001
10 mins	103.08 \pm 13.03	96.44 \pm 13.48	0.01
20 mins	108.62 \pm 11.05	96.20 \pm 12.04	0.001
30 mins	109.56 \pm 12.02	97.50 \pm 11.74	0.001
40 mins	107.56 \pm 9.57	97.91 \pm 9.54	0.003
50 mins	113.30 \pm 9.76	99.76 \pm 10.01	0.005
1 hr	113.16 \pm 9.30	112.70 \pm 12.12	<0.001
MEAN ARTERIAL PRESSURE STUDIED GROUP AFTER SUB-ARACHNOID BLOCK			
MAP (mm Hg)	GROUP A (N=50) (mean \pm SD)	GROUP B (N=50) (mean \pm SD)	P value
Just after	78.74 \pm 12.89	66 \pm 9.61	0.006
10 mins	72.94 \pm 12.29	66.86 \pm 8.09	1.51
20 mins	73.04 \pm 8.45	68.50 \pm 7.34	0.51
30 mins	73.90 \pm 7.82	65.26 \pm 7.48	0.07
40 mins	71.64 \pm 7.96	69.08 \pm 6.09	0.37
50 mins	75.26 \pm 9.21	72.48 \pm 6.86	0.09
1 hr	83.90 \pm 7.57	81.86 \pm 5.44	0.91

VASOPRESSOR AND ITS DOSE IN STUDY GROUPS			
	GROUP A (N=50)	GROUP B (N=50)	P value
VASOPRESSOR (N%)			
YES	9 (18 %)	32 (64%)	0.005
NO	41 (82 %)	18(36 %)	

Table 1: Various haemodynamic parameters of both study groups

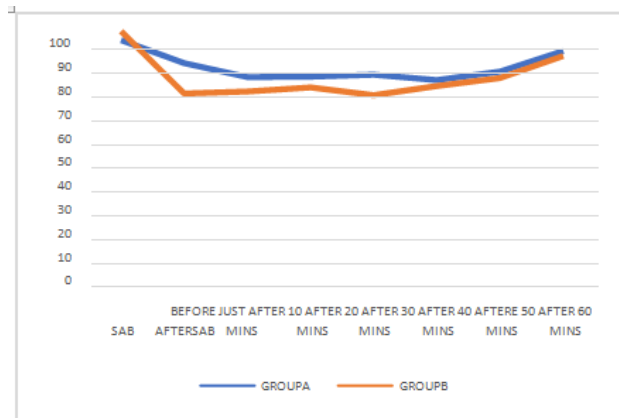


Figure.1. Trends in mean Arterial BP in both Groups

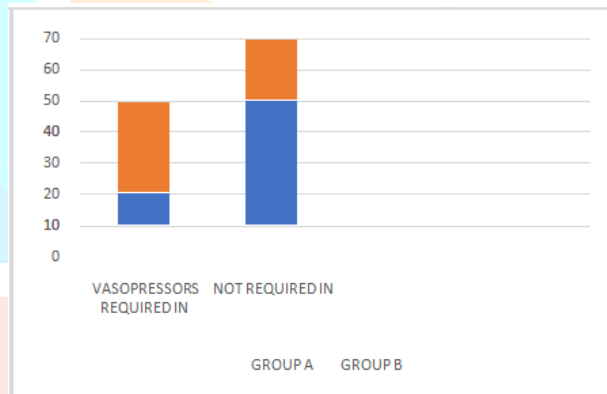


Fig 2. Trends In requirement of vasopressors in both groups

RESULT

The mean age in both the study groups is 26.5 years. Before administering sub arachnoid block no statistically important alteration is noted among the two groups in regards to mean heart rate, systolic blood pressure (SBP), diastolic blood pressure (DBP regards), and mean blood pressure (MBP). However, post administration of block difference between mean systolic BP was found to be statistically significant in both the groups¹². Similarly difference in mean arterial BP in both groups was also found to be significant just after spinal anaesthesia and at intervals of 30 and 40 minutes. It is also seen that here is statistically important alteration in the requirement of vasopressors in both the groups (Table 1, Fig. 2). The essential for vasopressor was suggestively lower in group I than in group II (18% vs. 64%) respectively¹³.

DISCUSSION

Unless contraindicated sub arachnoid block is regarded as, reliable, safe and most commonly followed method of regional anaesthesia for caesarean segment worldwide. However, its association with life-threatening risks viz. hypotension and severe Brady-arrhythmias need to be taken into account. It is abundantly established in various clinical publications that the requirement of block height of up to the level of T4 is required for lower segment caesarean section¹⁴. This level of blockade causes decreased sympathetic outflow leading to a reduction in systemic vascular resistance, venous return and in turn a decrease in preload which finally through various mechanisms manifests as arterial hypotension¹⁵. Reduction in preload stimulates serotonin sensitive chemoreceptors and mechanoreceptors in the ventricular wall, that stimulate Bezold-Jarisch reflex. Various other mechanisms including but not restricted to decreased SA nodal stretch reflex, Atrial Bainbridge reflex lead to Bradycardia and when compounded with a decrease pre-load this leads to a sudden haemodynamic collapse. Hence, measures on prevent alternately treat the hemodynamic transforms created by spinal anaesthesia would be obliged. Different systems for keeping cardiovascular results about subarachnoid piece including preloading What's more coloadng for i. V.

Infusion, organization of sympathomimetic, organization about atropine, and tolerant positioning encouraging venous come back have already been published in literature¹⁶. But all these methods have their own set of complications viz. use of volume preload and vasopressors is associated with complications including but not restricted to volume overload and increase in cardiac workload respectively which may cause peri-operative haemodynamic collapse in labile patients. Hence a study was conducted to see the effect of ondansetron to attenuate the post spinal hypotension caused after spinal anaesthesia by blocking the 5 HT receptors.

This randomized controlled trial (RCT) showed that the preemptive utilization of both joined together liquid preload and vasoconstrictors. Also utilization of Ondansetron alone fundamentally diminished those frequency about post-spinal hypotension (PSH) starting with 33% will 13.3% Also 15.6 individually. In any case no critical Contrast might have been demonstrated between both regimens for decreasing the frequency for PSH and also they decreased utilization of the utilized vasoconstrictors. Furthermore liquids to right hypotension same time the distinction in the imply amount about liquid boluses. What's more measurement for ephedrine utilized the middle of both bunches might have been statistically inconsequential which finishes up that Ondansetron could a chance to be utilized as An sole agenize over diminishing the frequency for post-spinal hypotension¹⁷.

PSH may be brought about mossycup oak likely because of decreasing vascular tone arm and these brings about abatements venous profit. Furthermore systemic vascular safety. Thus, measures utilized to aversion about PSH would guided with increment vascular tone arm and venous profit which could be done. Toward utilizing vasoconstrictors, liquid administration, and positioning regimens. On large portions trials, liquid stacking need been investigated will keep PSH, yet the comes about were not done its favour¹⁸. For this clinched alongside mind, investigators have transformed their thoughtfulness regarding vasoconstrictors conventions will forestall postspinal hypotension. Conventionally, ephedrine might have been utilized. Concerning illustration the first-choice agenize should look after pulse. Its fortifying movement around alpha and beta-adrenergic receptors makes sure inotropic. Also chronotropic impacts on the heart.

Malhotrahb compared the utilization of Preload alone, vasoconstrictors alone and An joined together preload. What's more vasoconstrictor with A large portion volume and measurement utilized within the past 2 gatherings on forestall PSH. They found that An blending from claiming preload and vasoconstrictors required greatest impact in keeping spinal hypotension, trailed Eventually Tom's perusing the sole utilization of vasoconstrictor, same time preload alone needed the any rate as security against postspinal hypotension¹⁹.

During spinal anaesthesia for caesarean delivery, A lee et al. used prophylactic ephedrine to keep hypotension at bay. In 12 RCTs involving 571 women, significantly fewer women had hypotension when given ephedrine than when given a placebo.

During spinal anaesthesia for caesarean section, Kang YG et al. used prophylactic intravenous ephedrine implantation and observed that over patients provided for the infusion, systolic Circulatory strain didn't change essentially starting with the benchmark systolic Circulatory strain taking after spinal anaesthesia ($p > 0.1$).

Those system from claiming ondansetron. Previously, keeping PSH might have been interceded by restraint of Bezold-Jarisch reflex (BJR). This reflex will be interceded through vagal afferents. When activated, it reasons hypotension and bradycardia. Activating for chemoreceptors delicate to serotonin in the intracardiac divider might happen. Eventually Tom's perusing a diminishment for blood volume. It might prompt expanded vagal nerve activity, trailed Toward bradycardia and vasodilatation. In the ondansetron group, a few investigations bring tried its utilization for prophylaxis against Postspinal hypotension (PSH)²⁰.

A meta-analysis directed Eventually Tom's perusing gao et al. Included 10 randomized regulated trials with 863 patients who underwent surgical methods under spinal anaesthesia. This database Audit proposed that prophylactic organization from claiming i. V. Ondansetron diminishes those occurrences from claiming spinal anaesthesia-induced hypotension. Furthermore vasopressor utilization clinched alongside both obstetric. What's more non-obstetric patients.

In An investigation led by Terkawi et al. On 86 parturient for cesarean segment who were pre-medicated with i. V. Ondansetron 8 mg, indicated no noteworthy distinction in SBP, DBP, MAP, Also hr between those ondansetron. Also placebo aggregations.

CONCLUSION

In accordance with the earlier studies the present study also shows that the fall in mean systolic blood pressure, mean arterial blood pressure and use of vasopressors was significantly reduced when ondansetron was administered before spinal anaesthesia. Hence it is safely concluded that 5 HT₃ antagonist i.e. ondansetron can be used in preventing the haemodynamic instability in patients post sub arachnoid block.

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