

Comparative Analysis of Efficacy and Haemodynamic Response between Intrathecal Hyperbaric 0.5% Bupivacaine with Isobaric 0.75% Ropivacaine Utilizing Fentanyl as Adjuvant in Subjects Undergoing Umbilical Surgeries

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Abstract

Background: The present study aims the evaluation of hemodynamic reaction and efficiency of Intrathecal hyperbaric 0.5% Bupivacaine with isobaric 0.75% Ropivacaine utilizing Fentanyl in subjects who were planned for infra umbilical surgeries. **Subjects and Methods:** The patients planned with orthopaedic, urological, gynecological and general surgeries that involve the lower abdominal area. All the patients were planned under spinal anesthesia. A total of 50 patients were included in the study. Patients were divided into two equal groups. All the patients were included in one of the 2 underneath declared groups as Bupivacaine group (Group B) n=25 and Ropivacaine group (Group R) n=25. Bromage scale was used to evaluate the revival of motor blockage and compactness. To check the loss of sensation the pin prick was utilized. **Results:** In group B that is Bupivacaine the sensory block was found to be elevated as compared to group R. the dissimilarity was establish to be statistical important. The motor block of 3 mins and hypotension was found to be more advanced and dense in group B as compared to group R patients. **Conclusion:** As compared to 0.5% bupivacaine; the 0.75% isobaric ropivacaine showed a comparable time of motor blockade. It shows more promising result with dense motor block with the adjuvant utilization of Fentanyl in both the groups.

Keywords: Bupivacaine, Haemodynamic response, Fentanyl, Ropivacaine.

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Received: 25 July 2021

Revised: 03 September 2021

Accepted: 13 September 2021

Published: 30 June 2022

Introduction

The most extensive method for lower abdominal surgeries that provide a quick result and greater efficacy of motor and sensory block is the spinal anesthesia. The baricity of the anesthetic agent is one of the most chief significant properties.^[1,2] Because of the extensive period of blockade of Motor and sensory route there is broad utilization of 0.5% hyperbaric bupivacaine hydrochloride. In the surgeries that involve the lower abdomen, urology and lower limb the chief utilized form is the central neuraxial blockade. Ropivacaine is an optically unadulterated S-enantiomeric derivative of parent chiral molecule propivacaine, goes to the piperidylidide group of local anesthetics.^[3] By the accumulation of propyl group to the piperidine nitrogen atom contrast to the butyl group in bupivacaine, ropivacaine structurally be like the bupivacaine with alike anesthetic properties, it has abridged impending for cardiotoxicity and neurotoxicity with enhanced comparative sensory and motor

block profile.^[4]

In the caesarean delivery procedure according to various researches showed the effect of intrathecal ropivacaine in adjuvants like fentanyl and sufentanil.^[5,6] The side effects include the augmented nausea, itching and vomiting. It extends the revival for the parturient following the surgery.^[7]

Although bupivacaine is known for its long acting action; the side effects included arrhythmias, protracted period of sensory and motor blockade that requires compensation through introduction of lignocaine that is necessary to overcome such side effects. There is large utilization of 5% lidocaine which has transitory radicular excitation with single dose of spinal anesthesia. Ropivacaine eases the emotional suffering of being motionless for a larger duration of time following lower abdominal surgeries. Fentanyl is frequently utilized as an adjuvant medicine for regional anesthesia.^[8]

The main aim of current research was evaluation of the haemodynamic rejoiner and efficiency among the 0.5% Bupivacaine with 0.5% ropivacaine with adjuvant utilization

of fentanyl.

Subjects and Methods

The current research is the randomized blind study. A total of 50 patients were included in the study. The age range of the included patients includes 25 – 65 years. All the included patients were fitting in ASA 1 & 2 and were scheduled for urological, lower abdominal surgeries, orthopaedic surgery. In all the included patients there was administration of spinal anesthesia. Included subjects were equally separated into 2 groups with each group having 25 individuals each. The first group was group B that is Bupivacaine group and other group consists of group R that is Ropivacaine group. An exclusion criterion includes subject denial, complete contrast for regional anesthesia, failure to correspond with the subject, pregnancy, patchy or failed spinal.

In the previous night and also 2 hours before operation all the subjects were administered with tab Pantoprazole 40 mg and tab Alprazolam 0.25 mg. On admission in the operation theatre the ECG, blood pressure and oxygen saturation were observed and evidenced all through the surgery. All the patients were made positioned in lateral down. The patients were sterile and draping was done. The spinal anesthesia was done in L3L4 space. Once there was free flow of cerebrospinal fluid there was Intrathecal administration of 2.6 ml of 0.75% ropivacaine in adjuvant with 25 ug fentanyl. It was administered over the period of thirty seconds as per the accidental allpocation patients was turned in the supine position after the spinal anesthesia was administered. There was constant administered of haemodynamic factors. Intravenous crystalloids and vasopressors injection ephedrine was administered in case of low blood pressure; that is systolic pressure was less than 90 mmHg. Mephentremine 6 mg IV bolus was administered in case of impotunate hypotension.

At the end of surgery, after every 15 minutes till the subject entirely recuperates; evaluation of motor blockade was completed 3 min following intrathecal injection.

Statistical analysis

The data was analysed utilizing SPSS version 15.

Results & Discussion

Table 1: Demographic details - Group B and Group R

Variables	Group B	Group R	P value
Age (Mean ±SD)	39.94±10.41	38.2±11.10	0.54
Gender Distribution			
Male	15	14	0.09
Female	11	10	
Weight	67.10±9.47	65.25±9.10	0.41
Height	164.47±6.47	163.47±7.43	0.1
ASA Grading			
I	18	20	0.07
II	7	5	

Statistically significance at $p \leq 0.05$

Table 2: Bromage score after 3 minutes in Group B and Group R

Bromage Score	Grade III	Grade IV	P value
Group B	5	20	0.001*
Group R	22	3	

*indicates statistically significance at $p \leq 0.05$

Table 3: Hemodynamic parameters – Group B and Group R

Variables	Group B	Group R	P value
1. Incidence of hypotension			
Yes	14	5	0.01*
No	11	20	
2. Bradycardia			
Yes	7	7	0.51
No	18	18	
3. Nausea/Vomiting			
Yes	6	1	0.05*
No	19	24	
4. Ventricular arrhythmia			
Yes	1	1	0.47
No	23	25	

*indicates statistically significance at $p \leq 0.05$

Accumulation of glucose to the isobaric ropivacaine will create the drug hyperbaric, which has established to amplify pace of onset, period of block, and pace of revival.^[9,10,11] Bupivacaine is utilized usually for surgeries since of its elevated effectiveness and least neurological symptom.^[12,13] Age, Gender, weight and height among 2 groups were analogous and there were no statistical differences among the 2 groups. The period of surgery was 56.51 ± 31.12 mins in Group R and 47.45 ± 19.24 minutes in Group B and was establish to be statistically insignificant. In the present research, highest cephalad expand is evaluated following three minutes of injection of local anaesthetic by utilizing thrashing of sensation to pinprick T10 level. In Group B mean sensory level was T4 to T6 (4.84 ± 0.9) was superior while contrast to Group R where the mean stage was T5 to T8 (5.61 ± 1.01), which was in disparity with research performed by Jean-Marc Malinovsky et al, Whiteside et al.^[12,14,15] A research by Koltka K et al,^[16] found that extend of sensory block was superior in Group B than R. These results were in agreement with the findings of AlMustafa et al,^[17] Nevertheless, the onset times monitored in the research performed by Mahendru et al,^[18] did not alter where dexmedetomidine was extra to regular hyperbaric bupivacaine. Various findings in present research could be accredited to dissimilar explanations of onset time and reality that sensory block level of limb surgery is subordinate in the spine than that in LSCS.

The dissimilarity in motor blockade among groups were statistically noteworthy and analogous with research by Mantouvalou, Erturk E and CG Miller et al.^[19,20,21] Mc Namee DA et al,^[22] recorded the onset and period of sensory block at dermatome level T10, utmost upper and lower extend of sensory block and the onset, strength and period of motor block. However the median period of entire motor block was appreciably diminutive in the Ropivacaine group contrast with the Bupivacaine group in the present research.

In the present research we utilized 25 µg as a subsidiary and had comparable findings analogous to Erturk et al.^[20] The improved occurrence of nausea and vomiting in group B can be elucidated owing to superior frequency of hypotension and highest cephalad stretch.^[23,24]

Conclusion

0.75% isobaric Ropivacaine generates comparable period of motor blockade with steady hemodynamic contrast to hyperbaric Bupivacaine (0.5%) creating denser motor blockade through hypotension when Fentanyl is utilized as supplementary in all groups.

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How to cite this article: Patel AS, Patel AV. Comparative Analysis of Efficacy and Haemodynamic Response Between Intrathecal Hyperbaric 0.5% Bupivacaine with Isobaric 0.75% Ropivacaine Utilizing Fentanyl as Adjuvant in Subjects Undergoing Umbilical Surgeries. Acad. Anesthesiol. Int. 2022;7(1):8-10.

DOI: [dx.doi.org/10.21276/aanat.2022.7.1.2](https://doi.org/10.21276/aanat.2022.7.1.2)

Source of Support: Nil, **Conflict of Interest:** None declared.