VOLUME - 10, ISSUE - 12, DECEMBER - 2021 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Anaesthesiology

STUDY OF ANALGESIC EFFICACY OF MORPHINE AS AN ADJUVANT TO 0.5% HYPERBARIC BUPIVACAINE IN PATIENTS UNDERGOING LOWER ABDOMEN SURGERIES IN A TERTIARY CARE HOSPITAL IN KANCHIPURAM

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ABSTRACT

Background: Spial anesthesia surgeries will have short duration , postoperative pain will be present. In this study, we investigated the addition of morphine as an adjuvant to hyperbaric bupivacaine in subarachnoid block, in comparison with hyperbaric bupivacaine 0.5% alone to evaluate the beneficial effects of morphine in postoperative analgesia.

Aim : The aim of the study was to compare the analgesic efficacy of mixture of intrathecal bupivacaine 0.5% heavy and morphine with intrathecal bupivacaine 0.5% heavy alone for patients undergoing lower abdomen surgeries.

Objectives : The objective of the study was to compare the

1. Onset and duration of sensory blockade
2. Duration of sensory, motor blockade and postoperative analgesia between the two groups of patients who had undergone lower abdomen surgeries under spinal anaesthesia using bupivacaine heavy with or without morphine

Materials and Methods:60 Patients who were posted for lower abdominal surgery were selected and were divided randomly into two groups (30 in each group) A and B. Group A was given morphine 2mg(0.2 ml) with 2.8ml of hyperbaric Bupivacaine and Group B was given 2.8ml of hyperbaric bupivacaine with 0.2 ml saline. SPSS 24was used for statistical analysis.

Results: Patients received morphine as an adjuvant had increased duration of sensory block and postoperative analgesia compared to patients received bupivacaine alone ($P<0.05\%$).

Conclusion: This study concludes that postoperative analgesic effect is better when morphine is added as an adjuvant to hyperbaric bupivacaine in spinal anesthesia

KEYWORDS : Bupivacaine heavy,morphine,analgesia,intrathecal

INTRODUCTION:

When the surgical site is below the umbilicus, spinal anaesthesia is an appealing option among the regional techniques available. It causes sensory, motor, and sympathetic blockade in large amounts.When compared to general anaesthesia, it has the advantages of being less expensive, providing better postoperative pain relief, lowering PONV, and reducing the risk of thromboembolism.Patients can resume their normal oral intake more quickly after a subarachnoid block because it reduces stage I recovery time Intrathecal opioid administration combined with local anaesthetics is a technique for improving analgesia quality and reducing the need for postoperative analgesics.

The combination of local anaesthetics and opioids is based on the fact that these two classes of drugs provide analgesia by acting on two different sites. Local anaesthetics and opioids both act on the axon3 of the spinal nerve, while local anaesthetics act on the receptor site in the spinal cord.Intrathecally administered opioids such as morphine, fentanyl, buprenorphine, and nalbuphine have been used to speed up the onset and prolong the duration of sensory and motor blockade

Need for the study:

1. It highlights the importance of selection of best suitable adjuvant in spinal anesthesia for good postoperative pain relief
2. Morphine is considered the most effective opioid due to its potent and long-lasting effect. However, it has lost favor over the years due to dose dependent side effects such as pruritus, nausea, vomiting, and the most feared risk of delayed respiratory depression.Hence there is scarcity of studies comparing the effects of morphine given intrathecally with 0.5 percent bupivacaine.

AIM & OBJECTIVES

AIM

The aim of the study was to compare the analgesic efficacy of mixture of intrathecal bupivacaine 0.5% heavy and morphine with intrathecal bupivacaine 0.5% heavy alone for patients undergoing lower abdomen surgeries.

OBJECTIVES

The objective of the study was to compare the

1. Onset of sensory and motor blockade
2. Duration of sensory, motor blockade and postoperative analgesia between the two groups of patients who had undergone lower abdomen surgeries under spinal anaesthesia using bupivacaine heavy with or without morphine.

MATERIALS AND METHODS:

This was a randomized ,prospective study. After getting necessary permission, 60 patient's subjected to lower abdominal surgery in Meenakshi medical college and RI were observed. All patients included in the study were divided randomly into two groups A and B(30 in each group).

Group A was given 0.2ml 2mg morphine and 2.8ml hyperbaric bupivacaine and Group B was 0.2ml saline with 2.8 ml hyperbaric bupivacaine. sensory blockade and postoperative analgesic effect was observed . Statistical analysis was done using SPSS24 in this study.

RESULTS:

Table 1: Time to onset of sensory block at T10 (minutes) among the groups (n=60)

Mean onset time of sensory block in group A (Morphine) was 1.93± 0.45minutes and found to be significantly earlier than group B.

Group	Mean	Standard Deviation
GROUP-A	1.93	0.45
GROUP-B	3.30	0.54
t-value	10.71	
p-value	<0.001	
Significance	Significant	

**- p value by independent t test*

Table 2: Maximal sensory block attained among the two groups (n=60)

More number of patients in group A attained maximal sensory block (T4) than group B and was found to be statistically significant.

SENSORY BLOCK ATTAINED	GROUP-A		GROUP-B	
	No of Patients (N)	%	No ofPatients (N)	%
T4	20	66.67	3	10.00
T6	10	33.33	27	90.00
TOTAL	30	100	30	100
Chi-square value	20.38			
p-value	<0.001			
Significant	Significant			

Table 3: Time to regression of sensory block upto L1 (hours) among the groups (n=60)

Group	Mean	Standard Deviation
GROUP-A	4.65	1.03
GROUP-B	3.21	0.57
t-value	6.86	
p-value	<0.001	
Significance	Significant	

**- p value by independent t test*

Mean time to regression of sensory block upto L1 was 4.65±1.03hours in morphine group and found to be significantly longer than the control group which was 3.21±0.57hours.

Table 4 : Duration of analgesia (hours) among the two groups (n=60)

The mean duration of analgesia in the morphine group was 5.54±1.05 hours and found to be significantly longer than control group (3.62±0.61 hours).

Group	Mean	Standard Deviation
GROUP-A	5.54	1.05
GROUP-B	3.62	0.61
t-value	7.00	
p-value	<0.001	
Significance	Significant	

**- p value by independent t test*

Table 5 : VAS distribution among the patients of the two groups (n=60)

Patients in the morphine group had less mean VAS scores compared to control group.

Time (mins)	Group A		Group B	
	Mean	SD	Mean	SD
60	0	0	0	0
90	0	0	0	0
120	0	0	0.61	0.56
150	0	0	1.22	0.27
180	0.51	0.55	2.14	0.22
210	1.16	0.23	3.47	0.15
240	2.08	0.2	R	
270	3	0.13		
300	3.15	0.23		
330	3.47	0.05		
360	R			

DISCUSSION:

Subarachnoid blockade with hyperbaric bupivacaine is a well-established method for lower abdominal surgery. The brief duration of postoperative analgesia, on the other hand, is a drawback. Most individuals need further analgesics in the postoperative phase.

The use of opioids in conjunction with local anaesthetics is well acknowledged in anaesthesiologic practise, particularly in the administration of spinal anaesthesia during lower limb and lower abdomen procedures.IT morphine provides good post-operative analgesia and produces segmental analgesia at low doses, resulting in localised nociception with no motor, sensory, or autonomic side effect sowing to its hydrophilicity, limited systemic absorption, cephalad distribution in cerebrospinal fluid, and delayed rate of opioid receptor clearance.

There is also presently no clarity about the ideal dosage of intrathecal morphine, however it looks to be between 1–2.5mg. Taking into mind the maximum effective dosage of intrathecal morphine for analgesia, 2mg of morphine was employed in this investigation.

Katiyar et al. reported that intrathecal morphine was linked with improved haemodynamic stability when compared to 25g of intrathecal fentanyl in their investigation. Research studies by Shukla D and Khezri MB revealed similar results.The intraoperative and postoperative pulse rates, systolic blood pressure, respiratory rate, and SPO2 percent did not differ significantly between the two groups. There was no evidence of bradycardia.

Sensory Block;

More number of patients in group A attained maximal sensory block (T4) than group B and was found to be statistically significant.

The mean duration of analgesia in the morphine group was 5.54±1.05 hours and found to be significantly longer than control group (3.62±0.61 hours).

Mean time to regression of sensory block upto L1 was 4.65±1.03 hours in morphine group and found to be significantly longer than the control group which was 3.21±0.57 hours.Patients in the morphine group had less mean VAS scores compared to control group. To summarise, the sensory block parameters was significantly lower in the bupivacaine+ morphine group at few timelines versus the bupivacaine group alone for the onset while it was significantly higher for the duration. Morphine's limited lipid solubility accounts for its rapid onset but prolonged duration of effect. It has a duration of effect of 12-24 hours when injected intrathecally.

Earlier studies have shown the efficacy and safety of intrathecal 2 mg morphine coupled with hyperbaric bupivacaine to provide an average of 14 hours of analgesia.Abboud et al. evaluated 35 patients having caesarean delivery under spinal anaesthesia who received either 0.1 mg morphine, 0.25 mg morphine, or saline as an

adjuvant to hyperbaric bupivacaine. Excellent postoperative analgesia with a lengthy duration (27.74.0 h and 18.60.9 h, respectively) was established in patients taking morphine 0.1 and 0.25 mg). In another research, the effects of supplementing hyperbaric spinal bupivacaine with 2 mg morphine sulphate were investigated in 34 patients having caesarean delivery. Patients who received intrathecal 2 mg morphine in addition to hyperbaric bupivacaine required no further analgesia for 27.7 hours, compared to 20.3 hours for patients who received saline.When compared to intrathecal clonidine, Fogarty DJ et al. observed that intrathecal morphine was superior postoperative analgesic ($P < 0.001$) with considerably less rescue analgesic intake in 24 h.The present study corroborated with the above findings, confirming morphine's prolonged duration of sensory block.

Limitations:

1. Small sample size
2. Study period was very short .

CONCLUSION:

The present study concludes that, the intrathecal administration of 2mg of morphine along with 0.5% bupivacaine has a significant faster onset of sensory and motor blockade than bupivacaine alone for patients undergoing elective lower abdomen surgeries. Intrathecal morphine also significantly prolonged the duration of sensory, motor blockade and postoperative analgesia with negligible hemodynamic changes clinically with minimal side effects.

Hence, morphine can be safely recommended intrathecally along with 0.5% bupivacaine for its rapid onset of onset of sensory and motor blockade along with prolonged duration of sensory and motor block with minimal hemodynamic changes. Duration of postoperative analgesia is comparatively more . It is the only opioid approved by FDA for intrathecal use.

Acknowledgement:
Dr. Punitha, Department of Soial and Preventive Medicine, Meenakshi medical college, Kanchipuram.

Sources of Support: Nil
Conflicts of interest: Nil

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