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EVALUATION OF NALBUPHINE IN SAB WITH 0.5% HYPERBARIC BUPIVACAINE - A DOUBLE BLIND RANDOMIZED STUDY

Anaesthesiology

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ABSTRACT

Background and Aim: Spinal opiate analgesia is popular. The analgesia is intense and useful post operatively also. The rescue analgesia is minimal or can be avoided totally depending on the type of opiate.

Aim: To evaluate the efficacy of combination of nalbuphine 0.8mg with hyperbaric bupivacaine 0.5% compared to hyperbaric bupivacaine 0.5% with normal saline intrathecal route in providing pain relief Intraoperatively and extending into the post operative period, in lower abdomen and orthopaedic procedures.

Methods: 50 patients of ASA grade I and II physical status belonging to both the sexes scheduled for lower abdominal and orthopaedic surgeries .Patients were divided into two groups B and N randomly. GROUP B hyperbaric bupivacaine 0.5% 2.5ml(25mg)+normal saline 0.9% 0.5ml.GROUP N hyperbaric bupivacaine 0.5% 2.5ml(25mg)+ nalbuphine 0.8mg(0.5ml)

Results: No sedation in group B. Sedation was noted in group N (0.5% hyperbaric bupivacaine+ nalbuphine).Onset of sensory block was faster in group N than in group B. Onset of sensory action was in the range of 3 to 6 min in group B and in range of 2 to 3min in group N. Onset of motor block was only slightly faster in group N than in group B.

Conclusion: Addition of 0.8mg (0.5ml) of nalbuphine to hyperbaric bupivacaine 0.5% 2.5ml when compared to hyperbaric bupivacaine + normal saline causes definite prolongation of analgesia with minimal sedation.

KEYWORDS

0.5% H.Bupivacaine,Nalbuphine,Sensory Blockade.

INTRODUCTION:

The International Association for the study of pain "IASP" defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage". The threshold of pain is variable largely because of its emotional experience is extended into postoperative period. The cost of general anaesthesia ,the skill and specialized equipment needed for its administration make regional anaesthesia techniques inexpensive and easy to administer this along with other difficulties associated with general anaesthesia have led to popularity of regional anaesthesia techniques out of which SAB has gained popularity in surgeries of lower abdomen and orthopaedic procedure. Due to simple technique, high success rate and avoidance of multiple drugs lead to popularity of spinal anaesthesia .Discovery of opioid receptors in spinal cord opened new avenues for relief of pain by administering them intrathecal epidural route. Opioids have selective action characterized by intense analgesia. Addition opioids has synergistic action with local anaesthetic agents decreased dose of LA agents and prolongs pain relief up to several hours. Many drugs are under study and intrathecal nalbuphine is one such opioid, cardiovascular stability, minimal dose and volume of this drug that can be added to a local anaesthetic agent like bupivacaine make it an ideal opioid drug for study in association with local anaesthetic agents for intrathecal administration.

METHODS: Study done in ASRAM Medical College and Hospital,Eluru,Andhra Pradesh for a period of 12 months from 2017-2018. Informed consent was obtained from the patients.50 patients of ASA grade I and II of both sexes were selected and divided into two group. Group B 0.5% H.Bupivacaine 2.5ml + normal saline 0.9% 0.5ml. Group N H.Bupivacaine 0.5% 2.5ml+ nalbuphine 0.8mg .Patient is connected to monitors IV line secured in right or left lateral position and under strict aseptic precautions lumbar puncture carried out using 25G quincke's needle in L3-L4 space. After identification of CSF, required volume of drug along with nalbuphine was injected and patient turned to supine. Vital signs were monitored. Time of onset of complete paralysis according to bromage scale.

GRADE	% OF BLOCK	DEGREE OF MOTOR BLOCK
0-no block possible	0%	Full flexion of knees and feet
1-partial block	33%	Able to flex knees and resist gravity. full movement of feet
Almost complete block	66%	Unable to flex knee, still flexion of feet, block possible
3-complete block	100%	Unable to move legs and feet

PROCEDURE: The pulse rate, blood pressure, respiratory rate and spo2 were recorded before starting the case. Venous cannulation was obtained with 18G IV cannula and all patients were preloaded with 10ml/kg of lactate ringer solution. the patients were placed either in right lateral or left lateral position and under strict aseptic precautions the lumbar puncture was carried out in mid line using 25G Quincke babcocks needle through L3-L4 inter space. After the appearance of cerebrospinal fluid the required volume of the drug along with nalbuphine or normal saline 0.9% was injected and patient turned into supine position. Vitals such as pulse rate, blood pressure, respiratory rate and spo2 were monitored every one minute in first five min up to thirty min and every 10 min till end of procedure. Onset of sensory block was assessed using pinprick and that of motor block using bromage scale. The time of onset of complete motor blockade was taken as the time for complete paralysis. The height of sensory blockade was noted and two segment regression time was noted until the sensory regression to the L1 segment has occurred.

OBSERVATION AND RESULTS: Results were analysed in both the groups based on onset of action (sensory and motor) duration of action (sensory and motor) the highest dermatome level reached, time to two segment regression, duration of post operative analgesia.

ONSET OF SEDATION:

Onset of sedation (min)	Group N
Range	8-20
Mean	9.32

The mean time for onset of sedation was 9.32 min in group B.

ONSET OF ACTION (SENSORY): Onset of sensory block was faster in group N (mean time: 2.57 min) than in group B (mean time:4.6min)

GROUP	RANGE(MIN)	SD	MEAN
B	3-6	1.178	4.6
N	2-3	0.707	2.57

ONSET OF ACTION (MOTOR): Onset of motor block was only slightly faster in group N than in group B

GROUP	RANGE	SD	MEAN
B	6-9	1.3546	6.84
N	4-9	1.058	5.33

DURATION OF ACTION (SENSORY): The duration of sensory action was significantly higher in group N with mean time of 340.06 min while in group B mean time was 182.76

GROUP	RANGE (MIN)	SD	MEAN
B	160-200	12.07	182.76
N	315-365	25.07	340.06

DURATION OF MOTOR BLOCK IN MIN: The duration of motor action was significantly higher in group N mean time was 312.32 while in group B mean time was 117.2

GROUP	RANGE(MIN)	SD	MEAN
B	135-210	45.78	117.2
N	297-327	15	312.32

DURATION OF POST OPERATIVE ANALGESIA: The duration of postoperative analgesia was significantly increased in group N with a mean value of 450min and in group B it was 250 min

GROUP	RANGE(MIN)	SD	MEAN
B	203-382	36	250
N	405-495	45	450

DISCUSSION:

Subarachnoid block is most commonly used technique. Local Anaesthetic Bupivacaine acts mainly by blockade of voltage gated Na+ channels and on inhibition of calcium channels. Duration of bupivacaine is limited to 2-4 hours and associated with high incidence of side effects. Addition of small doses of Opioids extends duration of analgesia offered by spinal analgesics into post operative period with reduced doses of local anaesthesia and avoids prolonged residual motor paralysis. The principle finding of the study is that addition of Nalbuphine (0.8mg) to Subarachnoid block with 0.5% Hyperbaric Bupivacaine increases density of sensory block and increases duration of sensory blockade without increasing the intensity of motor blockade or prolonging recovery of micturation. No significant hypotension present. Improved perioperative analgesia following co-administration of Nalbuphine and Bupivacaine can be explained by synergistic inhibitory action of these agents on A delta and C fibres conduction. Antagonistic effects of nalbuphine at mu receptors could be an advantage in the postoperative period to reverse ventilator depressant effects of opioid agonist while still maintaining analgesia. Nalbuphine 10-15mg IV reverses postoperative respiratory depression caused by Fentanyl but maintains analgesia.

SUMMARY: Addition of small dose of opioid like Nalbuphine 0.8mg to 0.5% Hyperbaric Bupivacaine resulted in faster onset of sensory blockade, prolongation of 2 segment regres sion time ,prolongation of motor blockade and significant prolongation of post operative analgesia compared to 0.5% Hyperbaric Bupivacaine without any adjuvant.

CONCLUSION: Our study concluded that addition of 0.8mg Nalbuphine to 0.5% hyperbaric bupivacaine when compared to hyperbaric bupivacaine 2.5ml causes definite prolongation of analgesia with minimal sedation and contributes significantly to post operative analgesia without significant side effects.

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