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A PROSPECTIVERANDOMISED COMPARATIVE STUDY OF 0.5% HEAVY BUPIVACAINE 15mg WITH 0.9% SALINEAND 0.5% HEAVY BUPIVACAINE 15mg WITH 2mg MIDAZOLAM INTRATHECALLY IN LOWER ABDOMINAL SURGERIES AND LOWER LIMB SURGERIES.

Dr. S.Farooq Basha [1]
Assistant Professor, Department of Anaesthesiology, ACSR government Medical College, Nellore, Andhra Pradesh, India.
Corresponding Author: Dr. S. Farooq Basha, Flat No: 403, Teaching Staff Quarters, ACSR Government Medical College Campus, Nellore - 524 004, Andhra Pradesh, India.

ABSTRACT:
Spinal anaesthesia is unparalleled in the way a small mass of drug, virtually devoid of systemic pharmacologic effect, can produce profound, reproducible surgical anaesthesia. Further, by altering the small mass of drug, very different types of spinal anaesthetics can be produced. Low spinal anaesthesia, a block below T10, carries a different physiologic impact than does a block performed to produce higher spinal anaesthesia (greater than T5). The block is unexcelled for lower abdominal or lower extremity surgical procedures.The main reasons for the popularity of spinal block are that the block has well- defined endpoints and the anesthesiologist can produce the blocks reliably with a single injection[60]The versatility of spinal anaesthesia is afforded by a wide range of local anaesthetics and additives that allow control over the level, the time of onset and the duration of spinal anaesthesia. The distribution of local anaesthetic solutions within the subarachnoid space determinesthe extentof the neuraxial blockade producedbyspinal anaesthesia.Spinal anaesthesia with hyperbaric bupivacaine 0.5% is a popular method. Addition ofopioidsto local anaesthetics is verycommonlypractised.Though theopioids reduce the toxicity and cardiovascular effects of local anaesthetics this type of combinations may bring about additional undesirable problems like itching, nausea and vomiting and/or respiratory depression.Instead, there are many clinical studies in favour of intrathecal midazolam which has added advantages since it produces sedation, amnesia and anti nociceptive effects without any neurotoxicity or other side effects. Hence this study was designed to evaluate the efficacy, to know the duration of pain relief and to know the incidence of adverse effects and complications when midazolam is given along with bupivacaine intrathecally.

I. AIMS AND OBJECTIVES

1) To determine the clinical advantages of sub-arachanoid administration of Midazolam to qualitative regional blocks with Bupivacaine with regard to the provision of adequate intra-operative analgesia in lower limb and lowerabdominal surgeries.
2) To assess the analgesic effect, sedation and to note the enhancement of post operative analgesia by the use of a benzodiazepine like Midazolam as an adjuvant to local anaesthetic — 0.5% hyper baric Bupivacaine.
3) To study the other added benefits of using Midazolam as an adjuvant.

II. MATERIALS AND METHODS:

A clinical study comparing the effect of the addition of Midazolam to Bupivacaine to increase the analgesic effects of the spinal blockade in patients undergoing lower abdominal and lower limb surgeries done in the Department of Anaesthesiology at ACSR Government Medical College, Nellore. The study was undertaken after obtaining Hospital Ethics Committee clearance as well as written, informed consent from all patients after explaining and reassuring about the spinal procedure. A hundred patients posted for various elective lower limb and lower abdominal surgeries were studied in a randomized prospective manner.

Inclusion criteria

1. Patients between the age18–55 years of both sexes.
2. Patients belonging to American Society of Anesthesiologists physical status I/II.
3. Patients posted for elective lower limb and lower abdominal surgeries.

Exclusion Criteria

Patients with a history of known sensitivity to the drugs used. Patients with gross spinal deformity, peripheral neuropathy or had any contraindication to neuraxial block - local / Systemic infections, coagulation disorders, hypovolemia, signs of raised intracranial tension, uncontrolled hypertension.

III. RESULTS AND CONCLUSION:

In this present study, we compared 0,5% hyperbaric bupivacaine 15mg and 0.5% hyperbaric bupivacaine 15mg with 2mg midazolam given intrathecally.The present study was conducted on 100 patients of either sex in the age group between 18-60 years belonging to ASA Grade I and II. These patients were posted for elective lower abdominal and lower limb surgeries.

The patients were divided into two groups of fifty each.

Group I- received 0.5% hyperbaric bupivacaine 3ml+0.4ml 0.9% normal saline.

Group II - received 0.5% hyperbaric bupivacaine 3ml + 0.4ml preservative free Midazolam (2mg)

With the present study, we can summarize the usage of preservative-free midazolam in the subarachnoid block as an additive with bupivacaine provides faster onset of sensory and motor block, better sedation. good quality and prolonged post operative analgesia with minimal side effects.

IV. DISCUSSION:

Pre-anaesthetic Evaluation

A thorough pre-anaesthetic evaluation with general physical and systemic examination was done the evening before the proposed surgery. General examination included recording pulse rate, blood pressure, airway assessment, examination of the respiratory and cardiovascular systems, spinal deformities and local infection at the lumbar puncture site.

Technique

A lumbar subarachnoid block was performed under strict aseptic precautions with the patient in the right lateral position with a pillow under the head and the table flat or,in the sitting position, when the patient could not be placed in the lateral position. Lumbar tap was made in the L3-4 inter-space, midline approach, using 23 Gauge Quincke needle, after local infiltration of skin using 2% Xylocaine. After obtaining a clear flow of CSF, the drug was injected slowly, after negative aspiration for blood. 0.4ml of Midazolam and 0.4 ml of 0.9% normal saline were measured using Insulin syringe.

Patients were made to lie supine immediately after the completion of theinjection. The time of injection of the drug was recorded as 0 minutes. During surgery, all patients were given intravenous fluids-Isotonic saline and ringers lactate for maintenance.

Intra operative Monitoring

NIBP, ECG, Pulse Oximeter were the intraoperative monitors used.The Heart rate and SpO2 were monitored continuously. Blood pressure was recorded every 2 minutes for the first 20 minutes, every 5minutes for the rest of the operation. Time intervals at which hypotension, bradycardia or other complications occurred were noted. Oxygen 4L/min via face mask was administered to all patients through out the procedure. Respiratory rate was monitored. Sedation score was recorded every10 minutes the first hour and every 30 minutes next till end of surgery.

Parameters studied

The following parameters were studied

1) Assessment of sensory blockade: Sensory blockade was assessed by pinprick and time noted for the block to reach different dermatomal level.

a) The onset of sensory block
b) Maximum height reached
c) Duration of analgesia

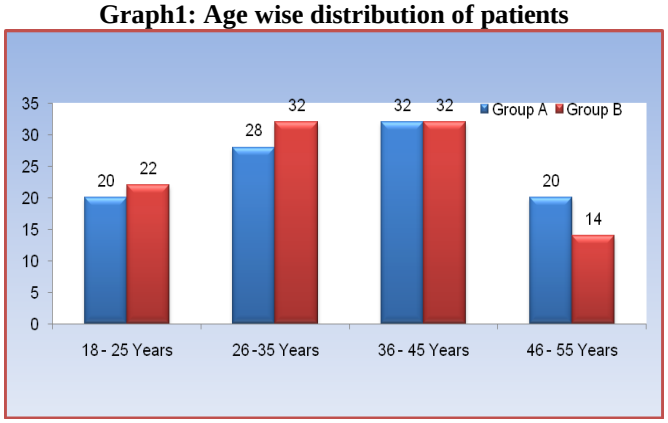
2) Assessment of onset of motor blockade.
3) The patients were carefully monitored for any untoward effects like inadequate block, hypotension, bradycardia, respiratory distress, nausea, vomiting, restlessness, pruritis, shivering, anaphylactic reaction intraoperatively.

Patients were shifted to the postoperative ward and observed till the first administration of analgesic (Diclofenac sodium 1.5mg/kg, intramuscularly was given when the patient demanded it) and for the next 72 hours postoperatively.

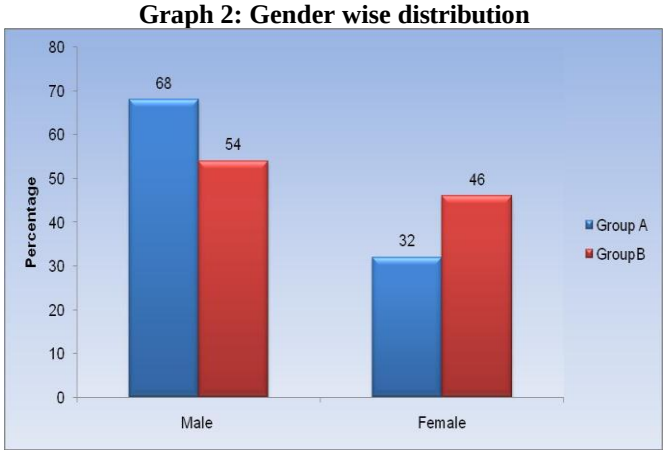
V. RESULTS

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on mean ± SD (Min-Max) and results on categorical measurements are presented in number (%). Significance is assessed at 5% level of significance. Paired t test is used to find the significance ofstudy parameters between two groups of patients and chi-squaretest hasbeen used to find the significance of study parameters on categorical scale between two groups. Statistical software spss 20.0 were used for the analysis of the data and Microsoft word and excel have been to generate graphs, tables etc. The results and interpretations are explained below.

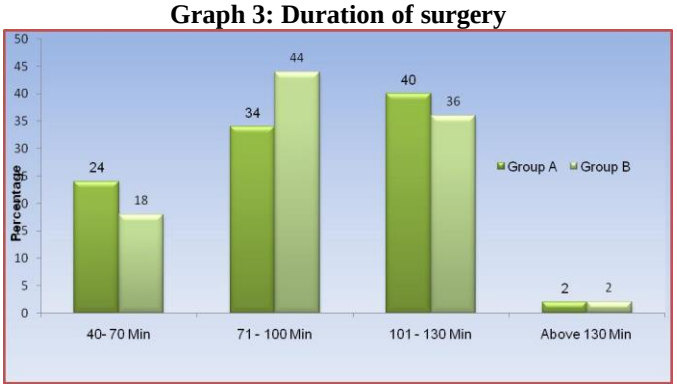
Graph1: Age wise distribution of patients



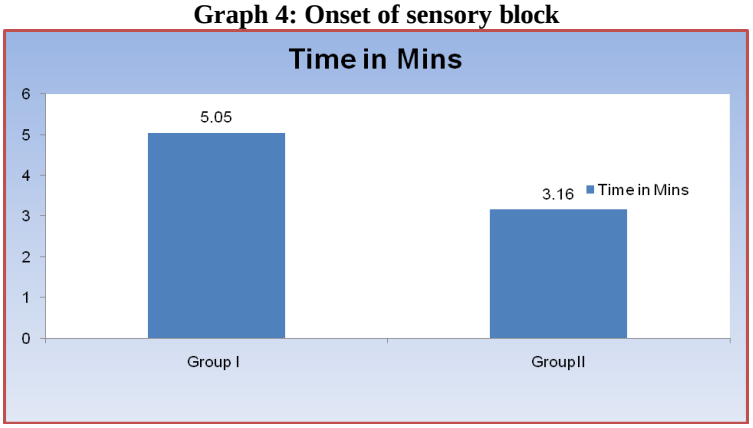
Graph 2: Gender wise distribution



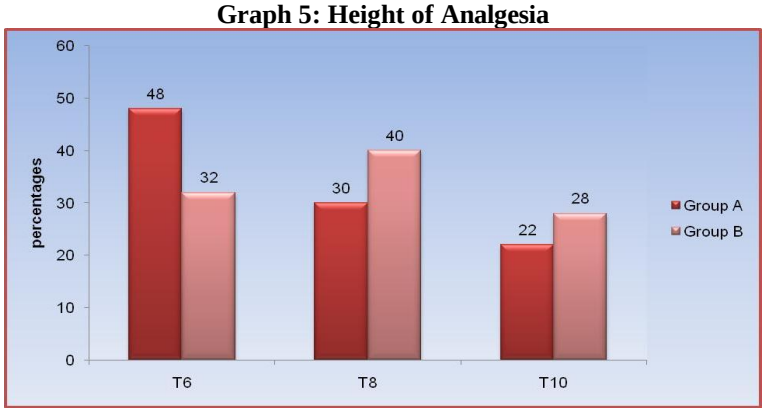
Graph 3: Duration of surgery



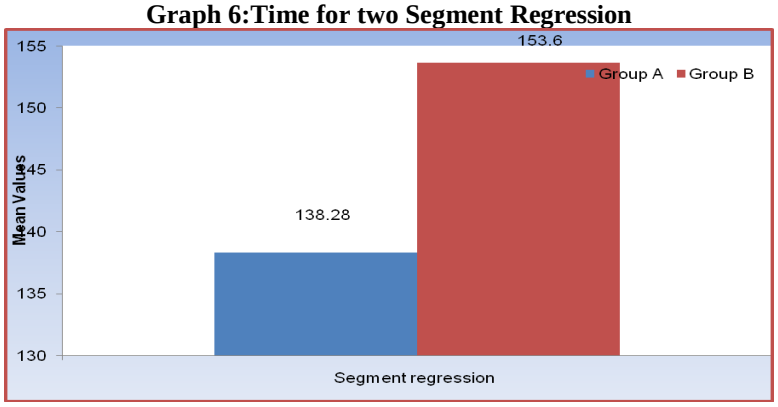
Graph 4: Onset of sensory block



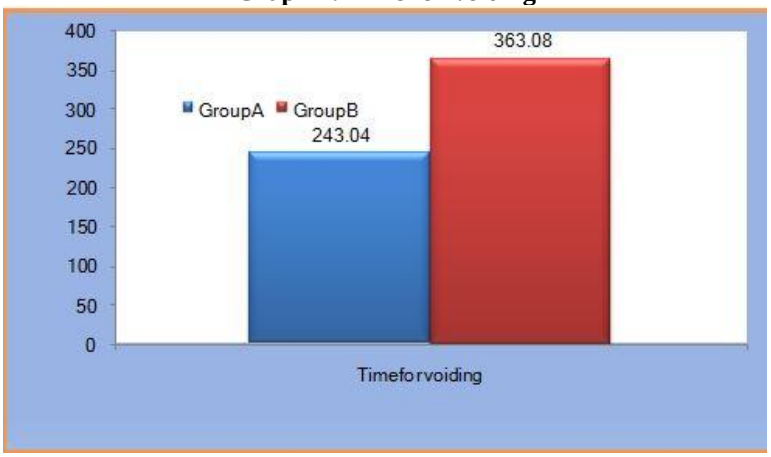
Graph 5: Height of Analgesia



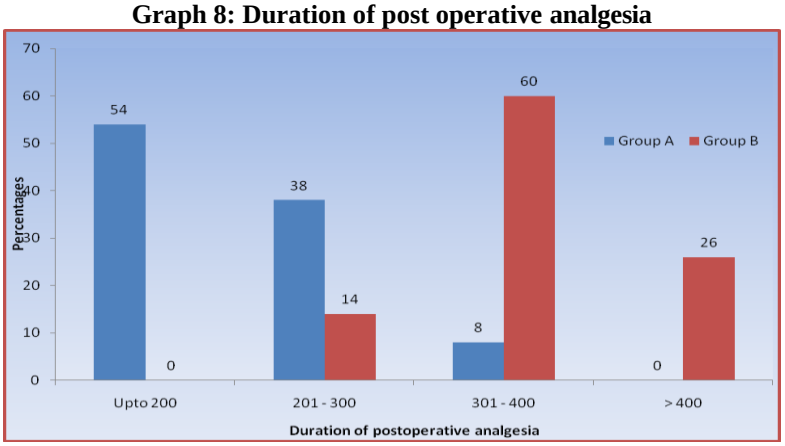
Graph 6:Time for two Segment Regression



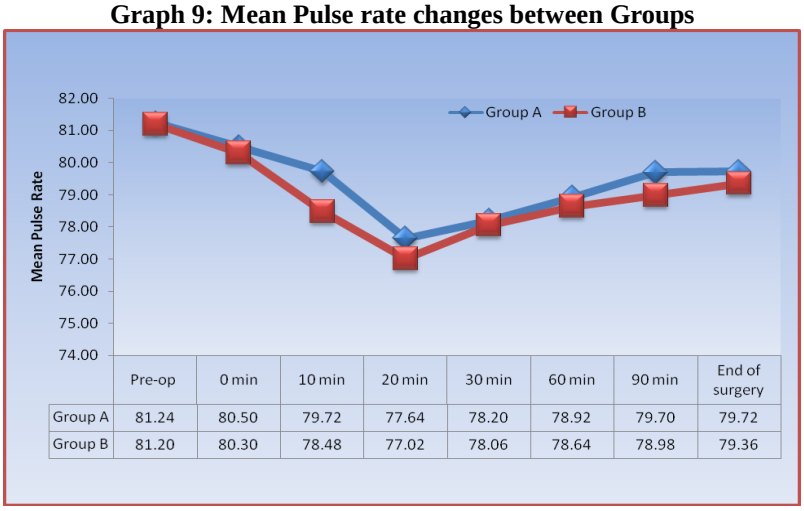
Graph 7: Time for voiding



Graph 8: Duration of post operative analgesia

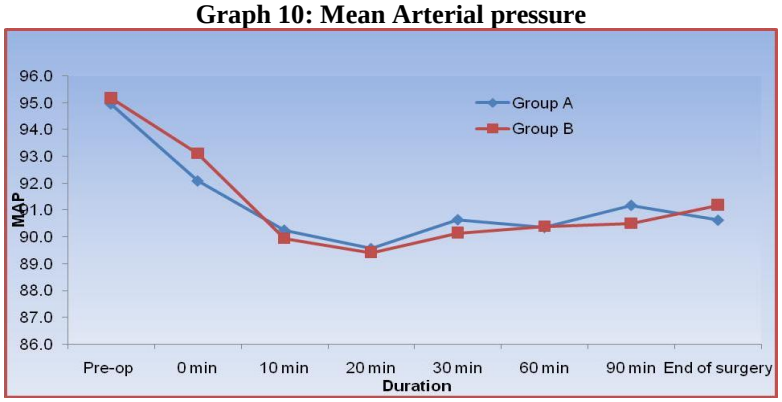


Graph 9: Mean Pulse rate changes between Groups

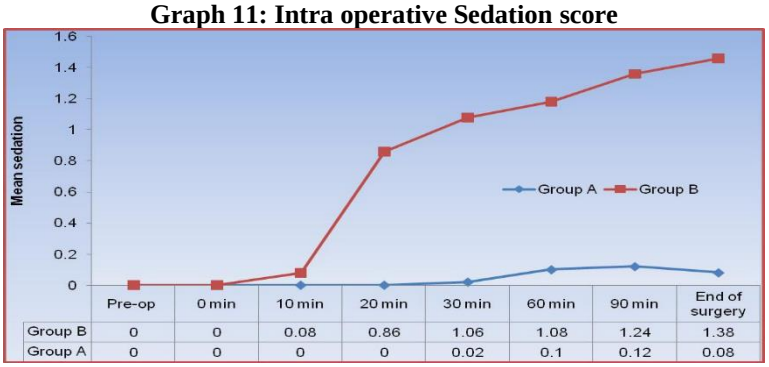


	Pre-op	0 min	10 min	20 min	30 min	60 min	90 min	End of surgery
Group A	81.24	80.50	79.72	77.64	78.20	78.92	79.70	79.72
Group B	81.20	80.30	78.48	77.02	78.06	78.64	78.98	79.36

Graph 10: Mean Arterial pressure

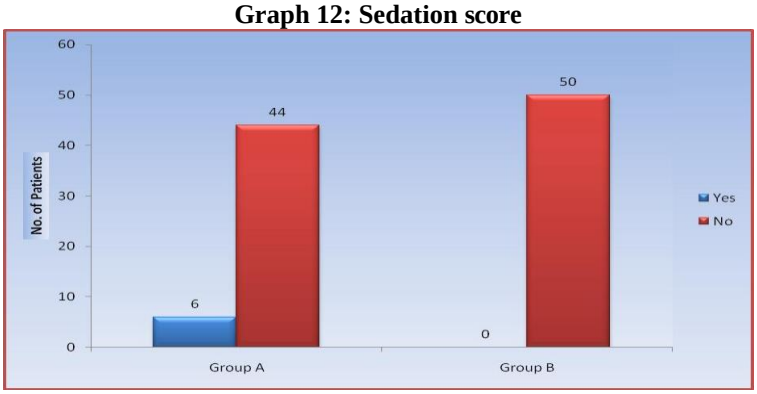


Graph 11: Intra operative Sedation score

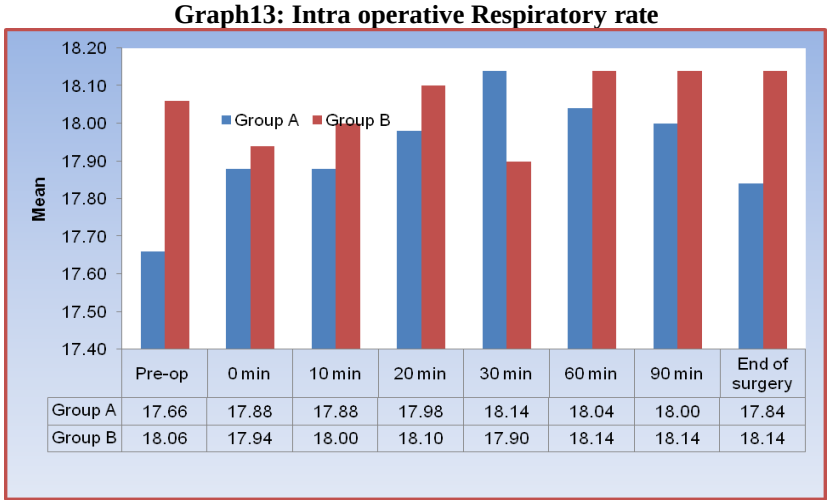


	Pre-op	0 min	10 min	20 min	30 min	60 min	90 min	End of surgery
Group B	0	0	0.08	0.86	1.06	1.08	1.24	1.38
Group A	0	0	0	0	0.02	0.1	0.12	0.08

Graph 12: Sedation score



Graph13: Intra operative Respiratory rate



	Pre-op	0 min	10 min	20 min	30 min	60 min	90 min	End of surgery
Group A	17.66	17.88	17.88	17.98	18.14	18.04	18.00	17.84
Group B	18.06	17.94	18.00	18.10	17.90	18.14	18.14	18.14

Results of the present study

In this study, the patients across the group did not vary much with respect to age, sex, height. In both groups, all the parameters were kept identical to avoid intraoperative and postoperative variations. In both groups, surgeries performed were almost identical.

Results of the present study

	GroupI	GroupII
Mean age (years)	35.48±10.63	34.40±9.99
Mean duration of surgery (mins)	94.10±25.69	95.88±21.97
Mean Onset of sensory block (mins)	5.05±0.79	3.16±0.53
Mean Onset of the motor blockade (mins)	5.24±0.80	3.44±0.54
Mean time for two segment regression (mins)	138.28±18.39	153.6±20.83
Mean time of postoperative analgesia (mins)	214.60±43.63	360.86±56.21
Mean time for Voiding (mins)	243.03±49.76	363.08±49.79
Hypotension%	2	2
Bradycardia%	3	2
Shivering%	3	2
Nausea+shivering%	2	1
H+B%	2	1

VI. CONCLUSION

On the basis of Anatomy, Neurophysiology, pathophysiology, pharmacology and the development of more effective techniques for the effective management of intraoperative analgesia, most of the patients suffer from pain in the postoperative period. It is proven that relief of pain with a subarachnoid block with a local

anaesthetic like Bupivacaine alone, is limited to the initial postoperative period. When a combination of bupivacaine and an adjuvant-like Midazolam is used, pain relief can be extended well into the postoperative period.

On the basis of this study, the conclusion is

1. Midazolam added with bupivacaine shows the faster onset of both sensory and motor block than bupivacaine alone.
2. The superior quality of surgical anaesthesia.
3. Intraoperative sedationis adequate with an addition of intrathecal midazolam, decreases the additional supplementation of sedatives
4. Good hemodynamically stability.
5. The postoperative analgesic requirement is decreased by prolonging the duration of analgesia.
6. Minimal side effects.

VII. SUMMARY

The subarachnoid blockade is effective in the management of both intraoperative pain and initial postoperative period. In order to increase the duration of postoperative pain, decrease intraoperative and postoperative complications, decrease postoperative supplementations many drugs are used as additives in the spinal block.

In this present study, we compared 0,5% hyperbaric bupivacaine 15mg and 0.5% hyperbaric bupivacaine 15mg with 2mg midazolam given intrathecally.

The present study was conducted on 100 patients of either sex in the age group between 18-60 years belonging to ASA Grade I and II. These patients were posted for elective lower abdominal and lower limb surgeries.

The patients were divided into two groups of fifty each.

Group I- received 0.5% hyperbaric bupivacaine 3ml+0.4ml 0.9% normal saline.

Group II - received 0.5% hyperbaric bupivacaine 3ml + 0.4ml preservative free Midazolam (2mg).

The following parameters were compared between the 2 groups.

1. Time of onsetof sensory block.
2. The maximum level of blockade.
3. Duration of sensory block.
4. The onset of motor blockade.
5. Duration of analgesia.
6. Time of first voiding as a measure of sympathetic recovery.
7. The incidence of the complications was also compared between two groups.
8. The present study across the group did not vary much with respect to age, sex, and duration of surgery.

The onset of the sensory blockade and motor blockade was faster with the addition of midazolam to bupivacaine as compared to bupivacaine. The mean time of two segment regression, mean time of voiding is prolonged in Midazolam group as compared to Group I,

The mean time of postoperative analgesia was significantly prolonged with the addition of 2mg midazolam to bupivacaine.

All patients in Group II were sedated and calm throughout the procedure and required no supplementation whereas 12% of Group I patients required sedation. Patients were observed intraoperatively and postoperatively for 72 hours and assessed for occurrence of complications like hypotension, bradycardia, nausea, shivering, and delayed complication like urinary retention, Transient neurological symptoms, post-dural puncture headache, stable in both groups.

With the present study, we can summarize the usage of preservative-free midazolam in the subarachnoid block as an additive with bupivacaine provides faster onset of sensory and motor block, better sedation. good quality and prolonged post operative analgesia with minimal side effects.

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