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A randomized comparative study between Bupivacaine and Midazolam combination with Bupivacaine alone in spinal blockage to evaluate post operative analgesia

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Introduction

In India surgery for lower lib, perennial region and lower abdominal commonly done by regional central nuro-axial block. Spinal anesthesia is safer option for lower abdomen, perineal and lower limb surgery. Bupivacaine is the most widely used drug for spinal anesthesia, however in higher doses it is associated with various complications. To keep the dosage of bupivacaine, minimum and reduce the side effects, various adjuvant have been tried to improve the sensory and motor blockade

Pain is a sensory-physical and emotional experience, it is always worry both patient and clinician. Issue of postoperative pain still not completely resolved. Due to pain, postsurgical patients are often unable to, move enough to their own daily needs or participate in their own rehabilitation. Postoperative pain relief helps in early mobilization of the patient good outcome, reduced morbidity and patient satisfaction.

There are various methods used to relieve pos-operatives pain such as postoperative oral opioids, parenteral drugs, local infiltration of drug, intrathecal or extradural drug administration. Regional analgesia has fewer side effects compare to systemic analgesia. One of the methods of providing effective postoperative analgesia is by prolonging the duration of intrathecal bupivacaine by additives such as opioids, clonidine, ketamine, midazolam[2,3,4,5] etc. However, each drug has its own limitations and a need for alternative methods.

Discovery of benzodiazepine receptors in spinal cord triggered the use of intrathecal midazolam for analgesia[6] .Midazolam is known to produce antinociception and potentiate the effect of local anesthetic when given in neuraxial block without having significant side effects.

Midazolam is a short-acting, potent, water-soluble benzodiazepine. It has been used for potentiating the analgesic effect of local anesthetic-induced neuraxial blockade. Spinal analgesia effect of midazolam is mediated by benzodiazepine – gamma aminobutyric acid (GABA) receptor complex which is abundantly present in the dorsal horn of spinal cord with high density found in lamina II of dorsal horn ganglia. Midazolam also

acts on kappa or delta opioid receptors which are also present in substantia gelatinosa of the spinal cord.

Hence, we planned this study to further assess midazolam in spinal blockage for prolong postoperative analgesia and we conducted randomized, comparatives study of intrathecal midazolam – bupivacaine combination with bupivacaine alone in spinal blockage for postoperative analgesia.

Aims and Objective

Primary Aim

- To study the effect of midazolam added to bupivacaine on onset, duration of motor & sensory block and post operative analgesia

Secondary Aim

- to study the hemodynamic parameters and side effects due to addition of midazolam

Material & Method

Study design: prospective, randomized controlled trial

Blinding: the participant, the observer and the person doing the analysis were blinded

Institutional ethical committee clearance was obtained and informed consents from patients, taken

Sample Size: 40 patients, divided randomly into two groups of 20 each, using a random number table

1. Group BM(*n=20*): bupivacaine (0.5%) 3 ml plus 0.2 ml midazolam (1 mg)
2. Group B(*n=20*): received bupivacaine (0.5%) 3 ml plus 0.2 ml normal saline

Allocation concealment was done using sealed envelope technique

This study was carried out in our institute (Katihar Medical College) over period of 3 months, from December 2019 to February 2020.

Inclusion Criteria

1. Patients belonging to American Society of Anaesthesiologists physical status I and II
2. Patients undergoing elective lower abdominal, Perennial and lower limb surgery under spinal anaesthesia
3. Anticipated duration of surgery less than 2 h
4. Age group between 18 and 60 years

Hemodynamically stable

Exclusion Criteria

1. Patient refusal
2. Patients with known neurological and psychiatric disorders
3. Patients with gross spinal deformity
4. Patients on sedatives, hypnotics, antidepressants, and drugs with effects on the nervous system

Preoperative vitals (HR, NIBP, ECG, SpO_2) were recorded

Preloading with ringer lactate @ 10ml/kg through 18G IV cannula

Spinal anaesthesia was administered in L3-L4 interspace using a 25G Quincke's needle

The level of sensory block assessed using loss of sensation to pin prick using a needle of 20 G

Motor block assessed by using modified Bromage scale

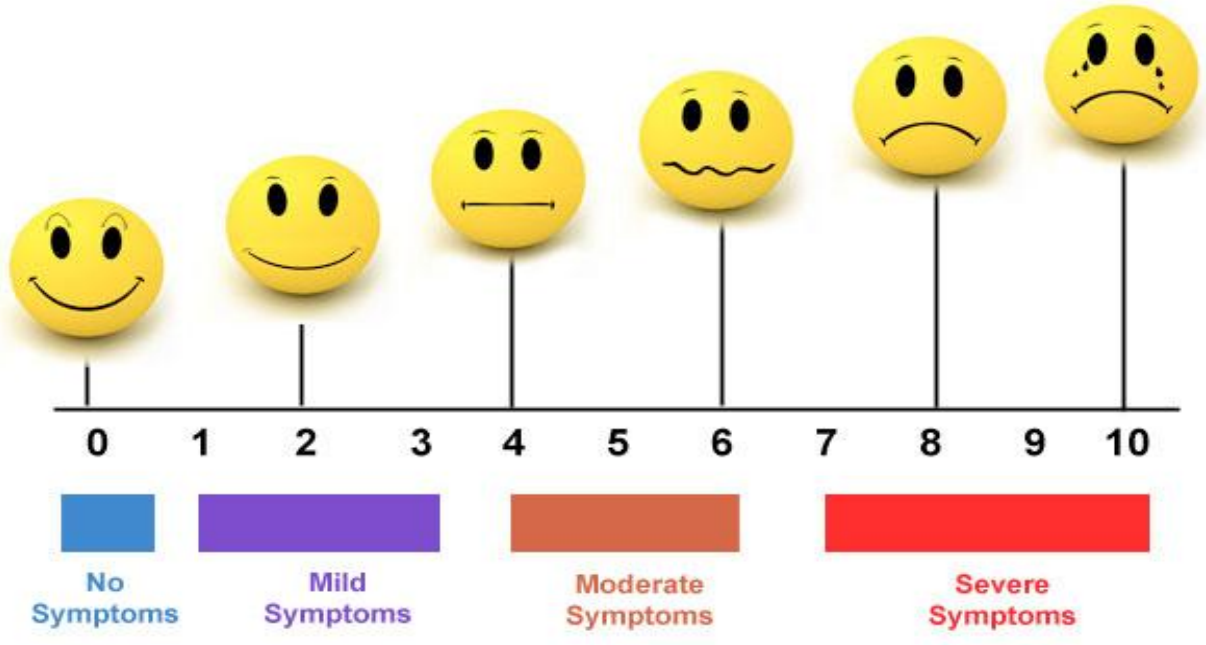
Onset of sensory block was defined as block up to T10 level

Onset of motor block was defined as attainment of Bromage scale-3

Duration of analgesia was recorded from its onset of block to the time when the first recue analgesia was given

Duration of sensory block- abatement up to S5 level

Duration of motor block- abatement up to Bromage-0

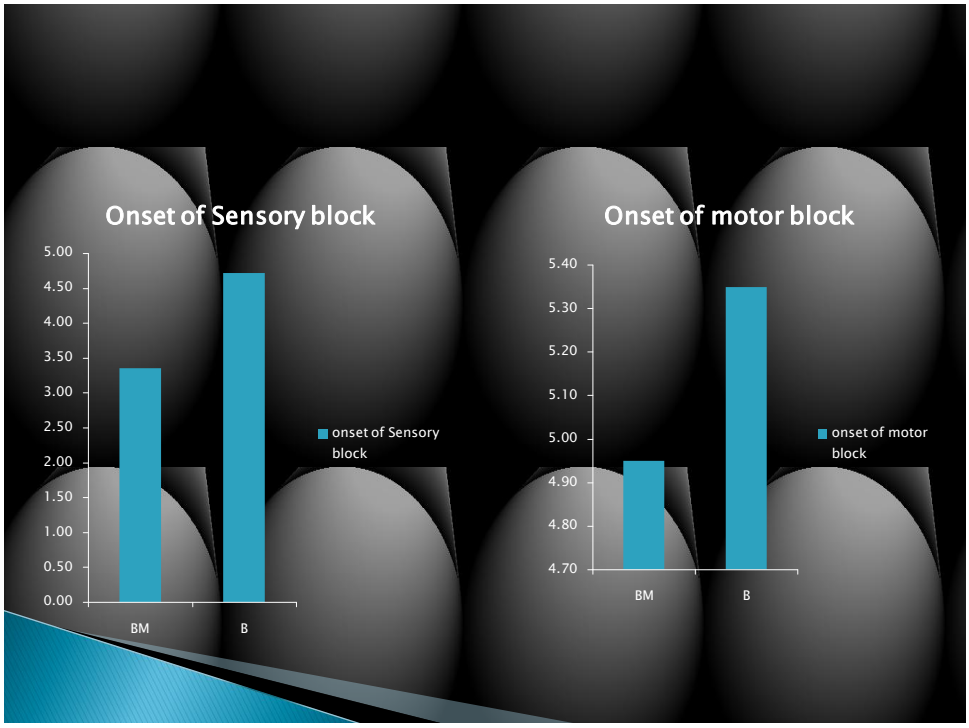


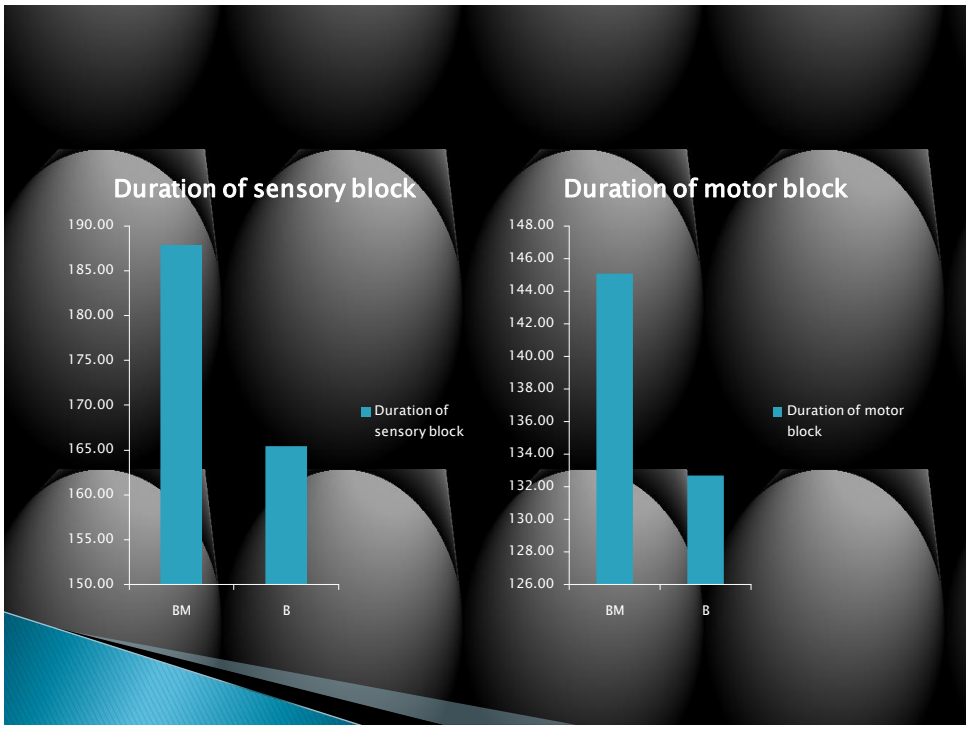
- Rescue analgesia was given with Inj. Tramadol 100 mg IV when VAS was ≥4 or the patient complained the pain
- Assessment was done at 0 hr, 1 hr, 2 hr, 3 hr, 4 hr, 5 hr, 6hr, 7hr, 8hr and 9 hr postoperatively
- SPSS 20 was used for statistical analysis; Student t test for continuous variable and Chi square test applied

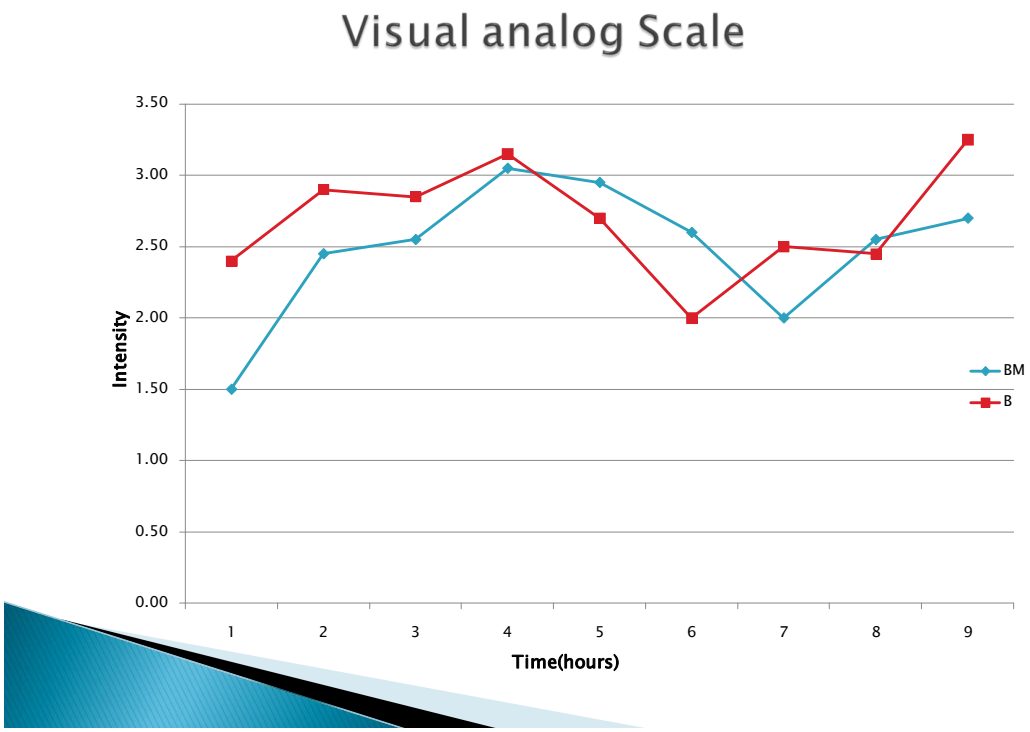
Results & Discussion

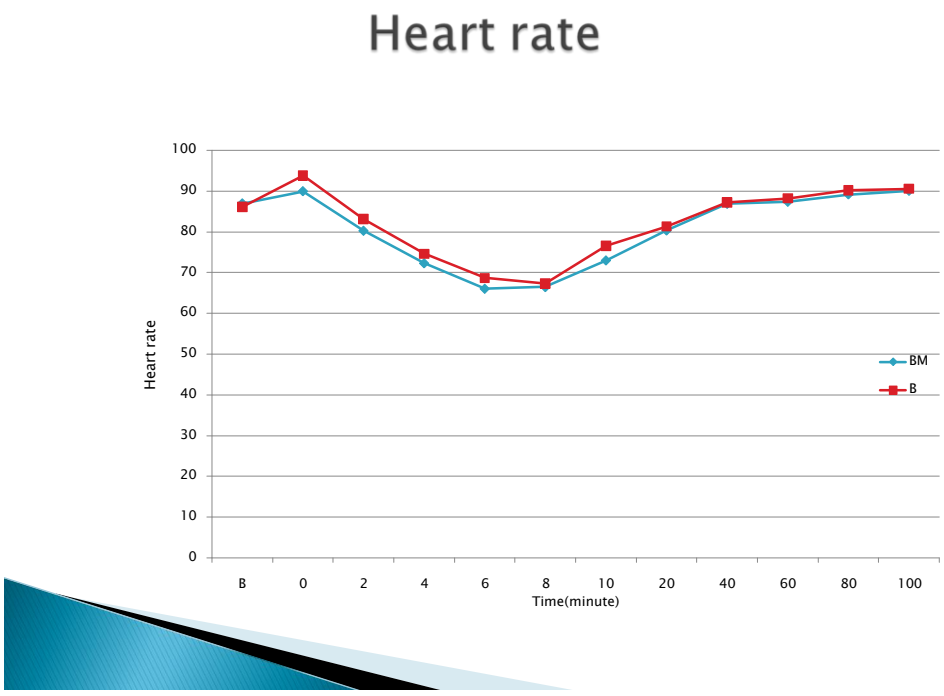
DEMOGRAPHIC PARAMETERS

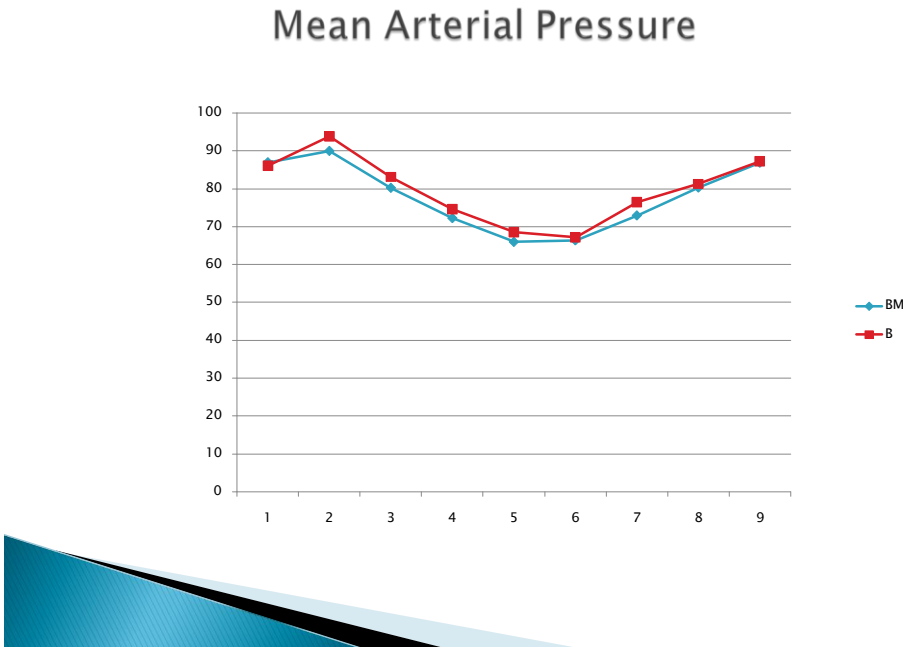
PARAMETER	Group-BM (n=20) [MEAN±SD]	Group-B (n=20) [MEAN±SD]	P - value	SIGNIFICANCE
AGE (in years)	39.55 ± 11.26	39.30 ± 9.43	0.706	NS
SEX (F:M)	13:7	10:10	0.605	NS
HEIGHT (in cm)	59.25 ± 6.73	155.73 ± 7.79	0.751	NS
WEIGHT (in kg)	51.37 ± 7.36	56.75 ±8.28	0.320	NS
DURATION OF Sx (min)	92.4 ± 8.77	89.15 ±10.42	0.293	NS
ASA (grade I/II)	1.65 ± 0.489	1.60 ± 0.503	0.752	NS


Onset of Sensory block
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
BM
B
onset of Sensory block
Onset of motor block
5.40
5.30
5.20
5.10
5.00
4.90
4.80
4.70
BM
B
onset of motor block


Duration of sensory block
190.00
185.00
180.00
175.00
170.00
165.00
160.00
155.00
150.00
BM
B
Duration of sensory block
Duration of motor block
148.00
146.00
144.00
142.00
140.00
138.00
136.00
134.00
132.00
130.00
128.00
126.00
BM
B
Duration of motor block


Visual analog Scale
Intensity
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1
2
3
4
5
6
7
8
9
Time(hours)
BM
B


Heart rate
Heart rate
100
90
80
70
60
50
40
30
20
10
0
B
0
2
4
6
8
10
20
40
60
80
100
Time(minute)
BM
B



Onset of duration of motor block, duration of sensory block, duration of surgery, duration of analgesia and Ramsay Sedation Score

Variables	Group BM (mean±SD)	Group B (mean±SD)	p value	HS/NS*
Onset of motor block (min)	4.95±1.317	5.35±1.309	.341	NS
Onset of sensory block(min)	3.35±.852	4.72±1.236	.000	HS
Duration of surgery (min)	92.40±8.774	89.15±1.429	.293	NS
Duration of sensory block (min)	187±13.328	165.50±14.307	.000	HS
Duration of motor block (min)	145±13.400	132.70±10.418	.002	S
Ramsay sedation score	2.30±0.733	2.10±0.788	.411	NS
Duration of analgesia (min)	340±49.139	189.10±44.032	.000	HS

Complication in both the groups

Complication	Group BM	Group B
Nausea	2(10%)	1(5%)
Vomiting	0	1(5%)
Hypotension	1(5%)	1(5%)

Conclusion

1) Addition of midazolam to bupivacaine prolongs the duration of sensory block, motor block and effective analgesia without affecting the level of sensory block suggesting thereby, that the dose requirement of bupivacaine and post-operative analgesia can be reduced by the addition of midazolam in order to keep its undesired effects.
2) No serious adverse effects were observed with dose of midazolam used. However, more studies are needed to define the ideal dose of midazolam for better results.

References

1. Mohler H, Okada T. Benzodiazepine receptor: Demonstration in central nervous system. Science 1977; 198: 849-51.
2. Venkateswaran R, Prasad KN. Management of post op pain. IJA 2006; 50:345-54.
3. Faull RLM, Villiger JW. Benzodiazepine receptors in human spinal cord : A detailed anatomical and pharmacological study. Neuroscience 1986 ; 17: 791-802.
4. Agrawal N, Usmani A, Sehgal R, Kumar R, Bhadoria P. Effect of intrathecal midazolam bupivacine combination on post op analgesia. Indian J Anaesth 2005;49:37-9.
5. Valentine JM, Lyons G, Bellamy MC. The effect of intrathecal midazolam on post-operative pain. Eur J Anaesthesiol 1996;13:589-93
6. Bhattacharya D, Biswas B, Banerjee A. Intrathecal midazolam with bupivacaine increases the analgesic effect of spinal blockade after major gynaecological surgery. J Anaesth Clin Pharmacol 2002;18:183-6.
7. Vaswani RK, Raiger LK, Bajaj P. h e ef ect of intrathecal midazolam on postoperative pain relief in orthopedic surgery. Hosp Today 2002;4:217-20.