



Comparison of Intrathecal Hyperbaric Bupivacaine 0.5% with Fentanyl and Hyperbaric Bupivacaine 0.5% with Buprenorphine in Trans Urethral Resection of Prostate

KEYWORDS

Bupivacaine, Fentanyl, Buprenorphine, Analgesia, Haemodynamic parameters

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ABSTRACT

To compare the characteristics of subarachnoid block of 0.5% of 3ml hyperbaric Bupivacaine heavy with 20µg Fentanyl versus 0.5% of 3ml hyperbaric Bupivacaine heavy with 60 µg Buprenorphine in subarachnoid block for Trans urethral resection of prostate in 60 patients. They were randomly divided in to two groups of 30 each. The onset of motor and sensory block was faster in fentanyl group compared to buprenorphine group. No significant difference was observed in haemodynamic parameters between both groups but associated with pruritis and post operative nausea and vomiting incidences were in lesser number.

INTRODUCTION:-

The comparative study was conducted with 0.5% of 3ml hyperbaric Bupivacaine heavy with 20 µg Fentanyl versus 0.5% of 3ml hyperbaric Bupivacaine heavy with 60µg Buprenorphine in 60 Patients. They were randomly divided into two groups of 30 each belongs to ASA grade I & II, undergoing Trans Urethral Resection of Prostate (TURP) under S.A. Block.

Group-A : 3ml of 0.5% hyperbaric Bupivacaine + 20µg of Fentanyl in 30 patients

Group-B : 3ml of 0.5% hyperbaric Bupivacaine + 60µg of Buprenorphine in 30 patients

Inclusion criteria:	Exclusion criteria:
1. ASA grade 1 and 2 patients.	1) Patients belonging to ASA grade 3 and 4
2. Age group of 50-70 yrs.	2) Physically dependant on narcotics.
3. Patients giving valid informed consent.	3) History of drug allergy.
4. Patients scheduled to undergo Trans urethral resection of prostate under subarachnoid block.	4) Gross spinal abnormality,
	5) Localized skin sepsis,
	6) Hemorrhagic diathesis
	7) Neurological involvement / diseases.

MATERIALS AND METHODS

Patients were premedicated with tab alprazolam 0.5 mg and tab ranitidine 150 mg orally 12 hours before giving spinal anaesthesia. Preoperatively base line parameters like heart rate, blood pressure, respiratory rate recorded and intravenous line established with a large bore intravenous cannula in a large peripheral vein. All patients were preloaded with 1 litre of ringer lactate and premedicated with 1 mg of midazolam iv 30 minutes before procedure. Monitored with ECG, NIBP, Pulse oximeter. We observed & recorded the parameters like HR, BP, RR in every 2 min for the first 10 min and every 15 min there after. Onset, level, intensity of recovery of the sensory & motor block were analysed and tabulated.

OBSERVATIONS AND RESULTS

Statistical analysis done and results expressed as mean & standard deviation with "P" value < 0.05 was considered statistically significant.

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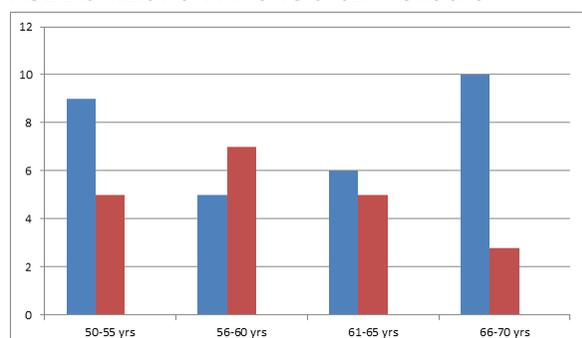
AGE	GROUP I	GROUP II
50-55 yrs	9	5
55-60 yrs	5	7
60-65 yrs	6	5
65-70 yrs	10	13

STATISTICAL DATA

	GROUP A	GROUP B
Minimum	50	50
Maximum	70	70
Mean	61.7	63.5
Standard deviation	7.03	6.59
Standard error	1.28	1.20

The standard difference between means of 2 groups is 1.8 and P value is 0.3105, so it was not statistically significant value.

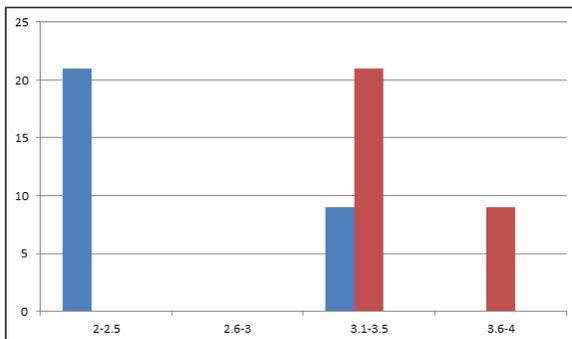
AGE DISTRIBUTION AMONG STUDY GROUPS



COMPARISON OF ONSET OF SENSORY BLOCKADE

	Group A	Group B
Minimum	2	3
Maximum	4	4
Mean	2.672	3.497
Standard deviation	0.476	0.352
Standard error	0.08	0.064

The standard difference of sensory block between two means was 0.825 and p value was 0.0001 which indicates the onset of action between two groups was significant.



HIGHEST LEVEL OF SENSORY BLOCK

SENSORY LEVEL	GROUP A		GROUP B	
	NO. OF PATIENTS	PERCENTAGE	NO. OF PATIENTS	PERCENTAGE
T4	1	3.33	0	0
T5	2	6.66	1	3.33
T6	10	33.33	8	26.66
T7	6	20	7	23.33
T8	4	13.33	6	20
T9	2	6.66	4	13.33
T10	5	16.66	4	13.33

The above table shows maximum level of sensory block up to T6 level in the two groups were 33.3% and 26.6% in group A and B respectively.

TIME TO ATTAIN HIGHEST LEVEL OF SENSORY BLOCK-ADE

	Group A	Group B
Minimum	6	10
Maximum	16	18
Mean	10.56	13.5
Standard deviation	1.897	2.07
P value	0.0001	

It was 10.56 mts and 13.5 mts in group A and B respectively with P value of <0.05 ,

found to be clinically and statistically significant.

ONSET OF MOTOR BLOCK

	Group A	Group B
Minimum	2.5	3
maximum	4	4.5
mean	3.01	3.53
Standard deviation	0.359	0.435
P value	0.0001	

This table shows statistically and clinically significant (P<0.05) Variation between two groups In onset of motor block.

MEAN HEART RATE

TIME	GROUP	MEAN	STANDRD DEVIATION	STANDARD ERROR	P VALUE	N
Prespinal	Group A	80.87	18.44	3.37	0.345	30
	Group B	85.30	17.59	3.21		30
2 min	Group A	80.93	16.32	2.98	0.369	30
	Group B	84.77	16.50	3.01		30
5 min	Group A	72.73	12.58	2.30	0.068	30
	Group B	79.87	14.71	2.69		30
30 min	Group A	67.80	11.17	2.04	0.060	30
	Group B	76.33	13.54	2.47		30
45 min	Group A	68.40	9.24	4.13	0.388	5
	Group B	73.60	8.76	3.92		5
60 min	Group A	64.00	11.31	8.00	0.712	2
	Group B	68.00	5.66	4.00		2

The variations in heart rates between 2 groups were found to be statistically insignificant, P value 0.05.

SYSTOLIC BLOOD PRESSURE

TIME	GROUP	N	MEAN	STANDARD DEVIATION	STANDARD ERROR	P VALUE
Pre Spinal	Group A	30	135.13	14.29	2.61	0.625
	Group B	30	137	15.12	2.76	
2 min	Group A	30	123.27	14.84	2.71	0.829
	Group B	30	124.07	13.63	2.49	
5min	Group A	30	119.53	10.30	1.88	0.738
	Group B	30	118.60	11.22	2.05	
30 min	Group A	30	120.2	13.64	2.49	0.737
	Group B	30	112.23	9.76	1.78	
45 min	Group A	5	114	5.48	2.45	0.339
	Group B	3	118.67	6.11	3.53	
60 min	Group A	2	115	7.07	5.00	0.667
	Group B	1	120			

The variations in Systolic BP between 2 groups were found to be statistically not significant (P>0.05).

DIASTOLIC BLOOD PRESSURE

Time	Group	N	Mean	Standard deviation	P value
Prespinal	Group A	30	82.3	6.006	0.8472
	Group B	30	82	6.000	
2 min	Group A	30	81.6	6.11	0.3449
	Group B	30	83.1	6.090	
5 min	Group A	30	76.06	6.18	0.1930
	Group B	30	74	5.932	
30 min	Group A	30	75.2	7.281	0.4949
	Group B	30	74	6.21	
45 min	Group A	5	78.8	3.487	0.001
	Group B	3	69.33	2.494	
60 min	Group A	2	79	3	
	Group B	1	82		

The variation in Diastolic BP in between two groups were found to be statistically not significant (p >0.05)

RESPIRATORY RATE

TIME	GROUP	N	MEAN	STANDARD DEVIATION	STANDARD ERROR	P VALUE
Pre Spinal	GroupA	30	20.50	4.08	0.75	0.615
	GroupB	30	20.00	3.56	0.65	
2 min	GroupA	30	18.40	3.28	0.60	0.938
	GroupB	30	18.47	3.31	0.60	
5 min	GroupA	30	17.30	2.84	0.52	0.378
	GroupB	30	18.03	3.52	0.64	
30 min	GroupA	30	16.80	2.87	0.52	0.325
	GroupB	30	17.60	3.35	0.61	
45 min	GroupA	5	20.00	2.83	1.26	0.591
	GroupB	5	19.00	2.83	1.26	
60 min	GroupA	2	19.00	1.41	1.00	0.811
	GroupB	2	19.50	2.12	1.50	

The mean R-R variation in both groups were disclosed here, shows statistically insignificant value as P>0.05.

DURATION OF SURGERY

	Group A	Group B
Minimum	30	30
Maximum	60	60
Mean	47.4	44.66
Standard deviation	12.04	11.54
P value	0.3719	

The above table shows duration of surgery for both groups, p value is 0.3719 so it is statistically significant regarding duration of surgery

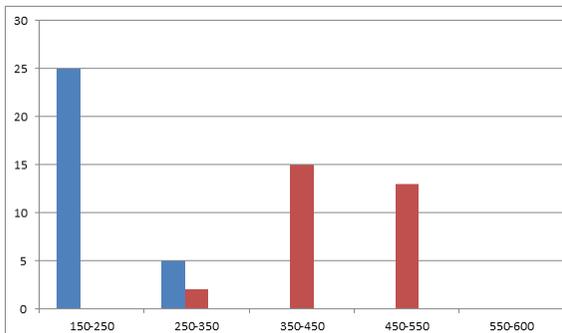
COMPARISON OF DURATION OF ANALGESIA

The duration of analgesia was taken as time from complete pain relief to the time when patient first complained of pain and demanded additional dose of analgesia.

	Group A	Group B
Minimum	170	320
Maximum	280	560
Mean	224.5	446.8
Standard deviation	25.83	49.48
P value	0.0001	

The above table shows mean duration of analgesia in 2 groups, P value is 0.0001. so variation between 2 groups is statistically & clinically significant

DURATION OF ANALGESIA IN BOTH STUDY GROUPS



RECOVERY PARAMETERS

TIME FOR SENSORY REGRESSION TO S1 IN MIN

	GROUP-A	GROUP-B
Minimum	180	300
Maximum	250	370
Mean	212.9	331.9
Standard deviation	17.411	22.529
P value	0.0001	

The above table shows time for sensory regression up to S1 between two groups displace the clinically and statistically significant variation with p value <0.05.

TIME FOR RECOVERY FROM MOTOR BLOCKADE IN MINUTES

	Group-A	Group-B
Minimum	182	296
Maximum	256	364
Mean	217.2	328.3
Standard deviation	14.66	17.42
P value	0.0001	

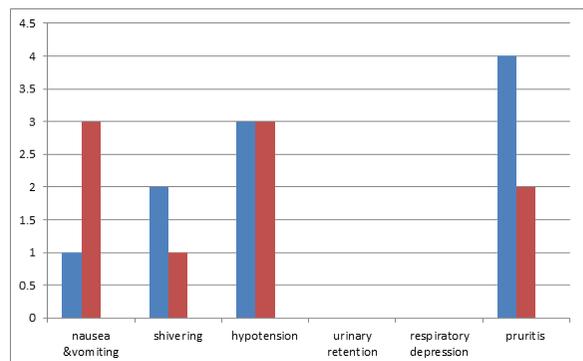
The above table shows statistically significant variation between two groups with p value of <0.05.

POST OPERATIVE COMPLICATIONS

ADVERSE EFFECTS	GROUP A	GROUP B
Nausea & vomiting	1	3
Shivering	2	1
Hypotension	3	3
Urinary retention	0	0
Respiratory depression	Nil	Nil
Pruritis	4	2
Dural puncture headache	nil	Nil

This table reveals more pruritis in group A patients and more nausea and vomiting in group B patients

COMPLICATIONS AMONG BOTH GROUPS



DISCUSSION

Neuraxial administration of opioids along with local anaesthetics improves quality of intra operative analgesia and also provides post operative pain relief for longer duration. Fentanyl, a highly lipophilic opioid, has rapid onset of action following intrathecal administration. It is associated with fewer side effects Buprenorphine a highly lipophilic opioid has slow onset of action and prolonged anaesthesia and fewer side effects compared to fentanyl

Onset of action

Onset of sensory blockade was 2.672 min in group (A) and 3.497 min in group (B) .Statistical comparison between 2 groups was found to be significant (P > 0.05).so the onset of sensory block in Group A is earlier when compared to Group B as in FA Khan et al¹ . The onset,duration,quality of block was faster in group A than group B as in Fauzi-

abano et al².

Highest level of sensory block :

It was up to T4 in group A and T5 in group B, But majority of patients of both groups were reached up to T6.

Time taken to attain highest sensory level :

It was 10.56mts in group A and 13.5mts in group B, correlates with the findings of FA Khan et al¹, as lesser time taken to attain highest sensory level block in fentanyl group than buprenorphine group.

Time taken for onset of motor blockade :

In our study it was 3.01 min in group A & 3.53 min in group B reveals less time taken for onset of motor block as in FA Khan et al¹.

Haemodynamic parameters;- Our study shows no significant difference in HR, RR,SBP,DBP between two groups,correlates with J.Koet al³, Kristiina S.Kuusniemi et al⁴, AM Kornohenetal⁵, Catherine O Hunt et al⁶, Jaishri-Bogra et al⁷, K.Jain et al⁸.

DURATION OF ANALGESIA:

The mean duration of analgesia for Group A is 224.5 min and for Group B is 446.8 min hence buprenorphine has prolonged analgesic effect compared to fentanyl as in Sapkal et al⁹, sumil Dixit et al¹⁰, SoumyaSamal et al¹¹.

COMPLICATIONS:

NAUSEA & VOMITING :

In our study nausea & vomiting occurred in 3 cases in Group B & 1 case in Group A

RESPIRATORY DEPRESSION:

None of the patients in our study group experienced respiratory depression.

Shivering,Hypotension and Urinary retention were occurred equally in both groups.

PRURITIS:

Observed in 4 cases of Group A & 2 cases of Group B

POST DURAL PUNCTURE HEADACHE:

Not observed in both groups Thus in our study post operative nausea & vomiting is more in buprenorphine group & pruritis is more in fentanyl group.

RECOVERY PARAMETERS:

TIME FOR SENSORY REGRESSION TO S1:

In our study mean time for sensory regression to s1 is 212.9 min in group A & 331.9 min in group B .statistical comparison between 2 groups is significant because p value is < 0.05

Thus fentanyl group has early sensory regression to s1 compared to buprenorphine.

TIME FOR COMPLETE RECOVERY OF MOTOR BLOCK-ADE:

In our study the mean time for Motor recovery is 217.2 min in group A & 328.3 min in group B .statistical comparison of both groups is significant p<0.05

Recovery from motor block is earlier in fentanyl group compared to buprenorphine group.

SUMMARY

Onset of motor & sensory block was observed to be faster with Fentanyl group compared to Buprenorphine group. No significant Haemodynamic parameters were changed in both groups. Time for sensory regression to S1, complete recovery of motor block, duration of complete analgesia, post operative analgesia were prolonged in Buprenorphine group when compared to Fentanyl group. Pruritis common in Fentanyl group & Post operative nausea & vomiting common in Buprenorphine group. Other parameters and side effects were occurred in very lesser or never occurred in both groups like shivering, hypotension, urinary retention and PDPH etc.

CONCLUSION

Our study clearly shows that bupivacaine with fentanyl has very early onset of analgesia and shorter duration of analgesia; where as bupivacaine with buprenorphine group shows delayed onset of action and prolonged duration of analgesia

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