ISSN No:-2456-2165

Comparative Study of Epidural 0.125% Bupivacaine with Butorphanol and Epidural 0.125% Bupivacaine with Nalbuphine for Postoperative Analgesia in Abdominal Surgeries

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Abstract:-
Background: Comparison of the safety and efficacy of nalbuphine 10 mg with 0.125% bupivacaine versusbutorphanol 2 mg with 0.125% bupivacaine by epidural route for providing postoperative analgesia in patients undergoing elective abdominal surgeries.

Methodology: The patients were randomly allocated into two groupsGROUP BB: received 2 ml of butorphanolwith 2.5 ml of 0.5% bupivacaine, diluted in normal saline to 10 ml. Butorphanol 2 mg + 0.125% bupivacaine GROUP BN (control group): received 1 ml of nalbuphine with 2.5 ml of 0.5% bupivacaine, diluted in normal saline to 10 ml. Nalbuphine 10 mg + 0.125% bupivacaine.

In the postoperative period, when the patients complained of pain, the intensity of pain was assessed using the VAS scaleThe pain intensity was assessed by VAS score at 0, 15, 30, 60 minutes, 2, 4, 6, 8, and 10 hours after epidural injection ,onset of analgesia, duration of analgesia, Systolic blood pressure, diastolic blood pressure, pulse rate, and respiratory rate were recorded at 0, 15, 30, 60 minutes, 2, 4, 6, 8, and 10 hours after epidural injection. SpO2 monitored continuously.

Results: The mean time of onset of analgesia in group BN was 8.57±1.25 minutes, and the meantime of onset of analgesia in group BB was 6.90±0.99 minutes.The mean duration of analgesia was 5.06±0.75 hours in group BN, and the mean duration of analgesia was 7.07±1.66 hours in group BB.

Conclusion: Butorphanol 2 mg with 0.125% bupivacaine provided faster onset of analgesia and longer duration of analgesia than with nalbuphine 10 mg with 0.125% bupivacaine.

Keywords:- *Epidural, bupivacaine, butorphanol, nalbuphine, post operative analgesia.*

I. INTRODUCTION

- The International Association for the Study of Pain (IASP) defines pain as an unpleasant emotional and sensory experience associated with actual or potential tissue damage or described in terms of such damage.
- Uncontrolled pain in the postoperative period may produce a range of detrimental acute and chronic effects.
- Adequate pain control is essential and has been recognized as a prime concern for anaesthesiologists.
- Epidural analgesia using local anaesthetics alone or combined with opioids provides adequate pain relief in the postoperative period. Combination of opioids to local anaesthetic solutions placed in the epidural space results in improved analgesia.
- The present study's primary goal is to assess and compare the safety and efficacy of epidurally administered butorphanol and nalbuphine as adjuvants with bupivacaine for postoperative analgesia in abdominal surgeries.

II. AIMS AND OBJECTIVES

A. Aims

Comparison of the safety and efficacy of nalbuphine 10 mg with 0.125% bupivacaine vs. butorphanol 2 mg with 0.125% bupivacaine by epidural route for providing postoperative analgesia in patients undergoing elective abdominal surgeries.

B. Objectives

- To compare the effectiveness of postoperative analgesia with epidural butorphanol with bupivacaine against nalbuphine with bupivacaine.
- To compare associated hemodynamic changes.
- To compare side effects like hypotension, bradycardia, nausea, vomiting, pruritis, sedation, shivering, motor block and respiratory depression.

ISSN No:-2456-2165

III. MATERIALS AND METHODS

The study was conducted in 60 patients of either sex between 18-60 years of age belonging to ASA class I and II undergoing elective abdominal surgeries in Government General Hospital, Kurnool,

A. Inclusion criteria

- Patients of age between 18 to 60 years
- Both Sex
- Patients of ASA grade I and II
- Patients undergoing elective abdominal surgeries

B. Exclusion criteria

- Patient refusal
- Patients of ASA grade III, IV and V
- Infection at the site of injection
- Patients with coagulation abnormalities
- Patients with hypersensitivity to local anaesthetics

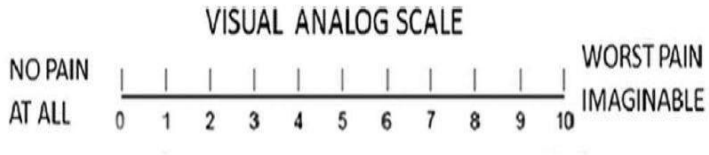
The patients were randomly allocated into two groups.

- **GROUP BB:** received 2 ml of butorphanol (1 ml of butorphanol ampoule contains 1 mg of butorphanol) with 2.5 ml of 0.5% bupivacaine, diluted in normal saline to 10 ml. Butorphanol 2 mg + 0.125% bupivacaine (total volume of 10 ml)
- **GROUP BN (control group):** received 1 ml of nalbuphine(1 ml of nalbuphine ampoule contains 10 mg of nalbuphine) with 2.5 ml of 0.5% bupivacaine, diluted in normal saline to 10 ml. Nalbuphine 10 mg + 0.125% bupivacaine (total volume of 10 ml)

The patients were explained about the epidural technique with the catheter in situ.

They were also educated about the usage of linear visual analog scale (VAS) for assessment of the intensity of postoperative pain and were instructed to mark on the scale at the point which he/she felt was representative of their level of discomfort.

- In the postoperative period, when the patients complained of pain, the intensity of pain was assessed using the VAS scale. When the VAS score was >5, the study drug was given through the epidural catheter.
- Group BN received nalbuphine 10 mg + 0.125% bupivacaine (total volume of 10 ml).
- Group BB received butorphanol 2 mg + 0.125% bupivacaine (total volume of 10 ml).
- The following parameters were observed.
- The pain intensity was assessed by VAS score at 0, 15, 30, 60 minutes, 2, 4, 6, 8, and 10 hours after epidural injection if patient complains of pain even after epidural injection intensity is assessed with VAS score and If it was >5, a non-opioid analgesic was given.



- **Onset of analgesia:** The time interval from the administration of the study drug till the VAS score came down to <5.
- **Duration of analgesia:** The time interval between onset of analgesia, till patient complained of pain (VAS score >5) when rescue medication was given.

Systolic blood pressure, diastolic blood pressure, pulse rate, and respiratory rate were recorded at 0, 15, 30, 60 minutes, 2, 4, 6, 8, and 10 hours after epidural injection. SpO2 monitored continuously.

Side effects like pruritis, nausea, vomiting, hypotension, bradycardia, sedation, motor block, shivering, and respiratory depression was recorded in both groups.

A. Stastistical analysis :

- In this study, 60 patients were made into 2 groups, each comprising of 30 patients.
- Continuous variables were represented as mean and standard deviation where data follows a normal distribution, otherwise as median with range.
- Categorical variables were represented as frequencies and percentages.
- The statistical significance of the difference in the outcome variables between the groups was assessed by the Chi-Square test, Fisher's exact test, and t-test.
- P-Value <0.05 was taken as significant statistically.
- P-Value <0.001 was taken as statistically highly significant.

B. Observations and Results

- **ONSET OF ANALGESIA:** The mean time of onset of analgesia in group BN was 8.57±1.25 minutes, and the meantime of onset of analgesia in group BB was 6.90±0.99 minutes. The onset of analgesia was faster in group BB compared to group BN, and it was statistically significant ($p<0.05$).

ISSN No:-2456-2165

Mean time of onset of analgesia	Group	Mean(min)	P value	p-value
	BN	8.57	1.25	
	BB	6.90	0.99	<0.01

Table 1: comparison of onset of analgesia in study groups

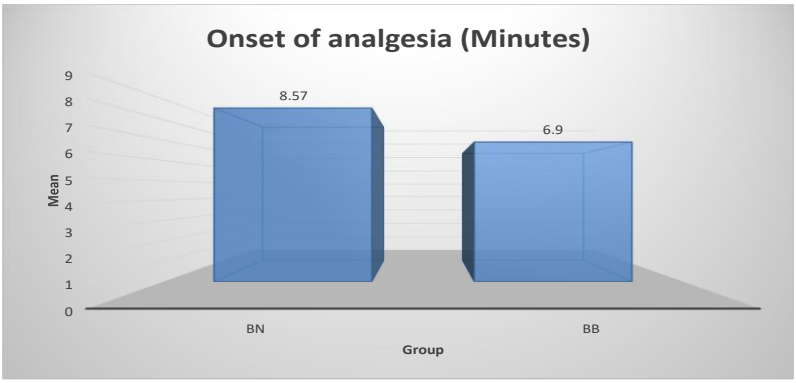


Fig. 1: Comparison of onset of analgesia in study groups

- **DURATION OF ANALGESIA**

The mean duration of analgesia was 5.06±0.75 hours in group BN, and the mean duration of analgesia was 7.07±1.66 hours in group BB. The duration of analgesia was longer in group BB compared to group BN, and it was statistically significant (p<0.05).

Mean duration of analgesia	group	Mean (hours)	SD	p-value
	BN	5.06	0.75	<.0.01
	BB	7.07	1.66	

Table 2: comparison of duration of analgesia between study groups

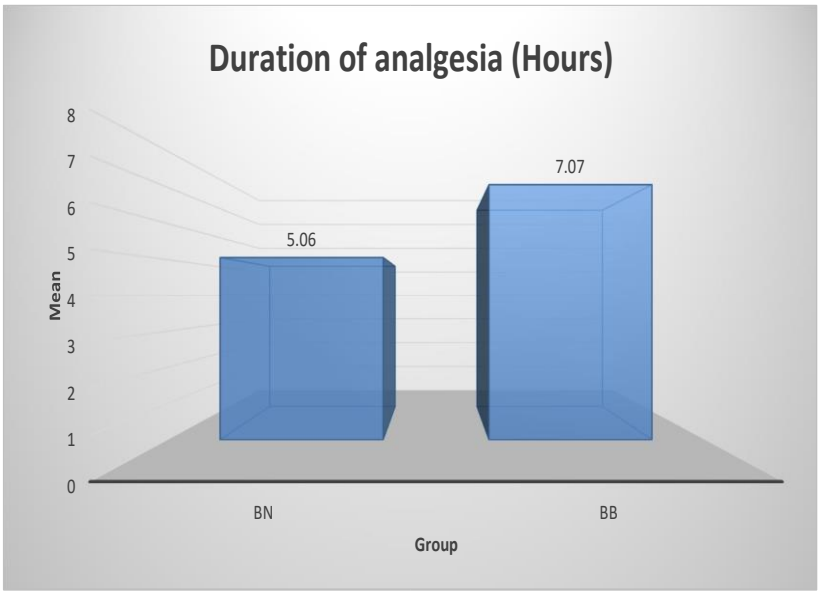


Fig. 2: comparison of duration of analgesia between study groups

- **VAS SCORE**

In group BN, the mean VAS scores at 0 min, 15 min, 30 min, 60 min, 2 hrs, and 4 hrs were 7.23±0.97, 3.5±0.77, 2.56±0.81, 2.06±0.69, 2.5±0.77, and 3.5±1.04. In group BB, the mean VAS scores at 0 min, 15 min, 30 min, 60 min, 2 hrs, and 4 hrs were 7.26±0.90, 3.23±0.56, 2.26±0.63, 1.76±0.5, 2.26±0.58, and 3.16±0.64. The mean VAS scores at 15 min, 30 min, 60 min, 2 hrs, and 4 hrs were lower in group BB compared to group BN, and it was statistically not significant.

Time	Group	Mean	SD	P-Value
0 Mins	BB	7.27	.907	
	BN	7.23	.971	0.89
15 Mins	BB	3.23	.568	
	BN	3.50	.777	0.13
30 Mins	BB	2.27	.640	
	BN	2.57	.817	0.11
60 Mins	BB	1.77	.504	
	BN	2.07	.691	0.06
2 Hrs	BB	2.27	.583	
	BN	2.50	.777	0.19
4 Hrs	BB	3.17	.648	
	BN	3.57	1.040	0.07

Table 3: Comparison of VAS scores among study groups

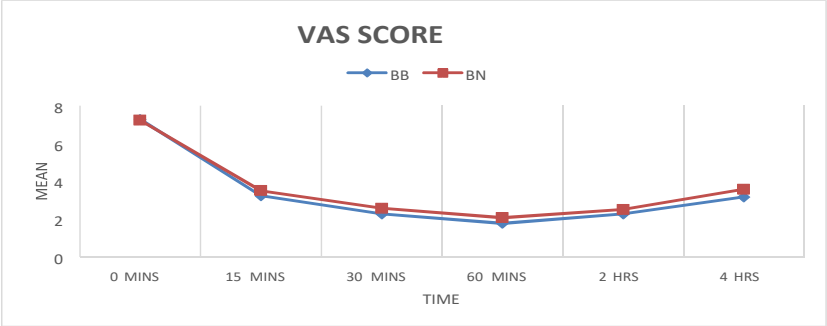


Fig. 3: comparison of VAS scores among study groups

Time	Group	Mean	SD	P-Value
0 Mins	BB	130.57	3.441	0.32
	BN	129.50	4.696	
15 Mins	BB	117.37	1.956	0.19
	BN	116.27	4.160	
30 Mins	BB	119.07	1.437	0.16
	BN	118.27	2.766	
60 Mins	BB	119.23	1.960	0.25
	BN	118.57	2.501	
2 Hrs	BB	119.97	2.173	0.24
	BN	119.13	3.170	
4 Hrs	BB	119.80	2.107	0.39
	BN	119.13	3.730	
6 Hrs	BB	121.30	2.168	0.28
	BN	122.13	3.598	
8 Hrs	BB	122.87	2.675	0.29
	BN	122.17	2.451	
10 Hrs	BB	121.87	2.776	0.54
	BN	121.47	2.255	

Table 4: Comparison of Systolic Blood Pressure among study groups

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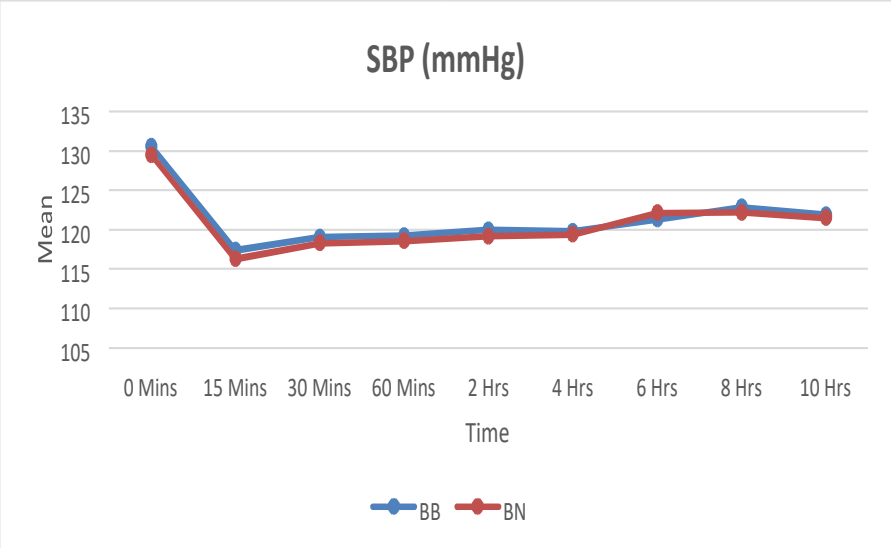

Fig. 4: Comparison of Systolic Blood Pressure among study groups

Time	Group	Mean	SD	P-Value
0 Mins	BB	84.60	2.966	0.25
	BN	83.77	2.687	
15 Mins	BB	78.97	2.773	0.44
	BN	78.47	2.240	
30 Mins	BB	78.20	1.955	0.46
	BN	77.83	1.931	
60 Mins	BB	78.73	1.721	0.26
	BN	78.13	2.360	
2 Hrs	BB	78.37	2.428	0.52
	BN	77.93	2.778	
4 Hrs	BB	78.67	2.708	0.76
	BN	78.47	2.515	
6 Hrs	BB	79.87	2.145	0.83
	BN	79.73	2.612	
8 Hrs	BB	80.27	2.449	0.55
	BN	79.93	1.818	
10 Hrs	BB	79.20	2.497	0.72
	BN	78.97	2.619	

Table 5: comparison of diastolic Blood Pressure among study Groups

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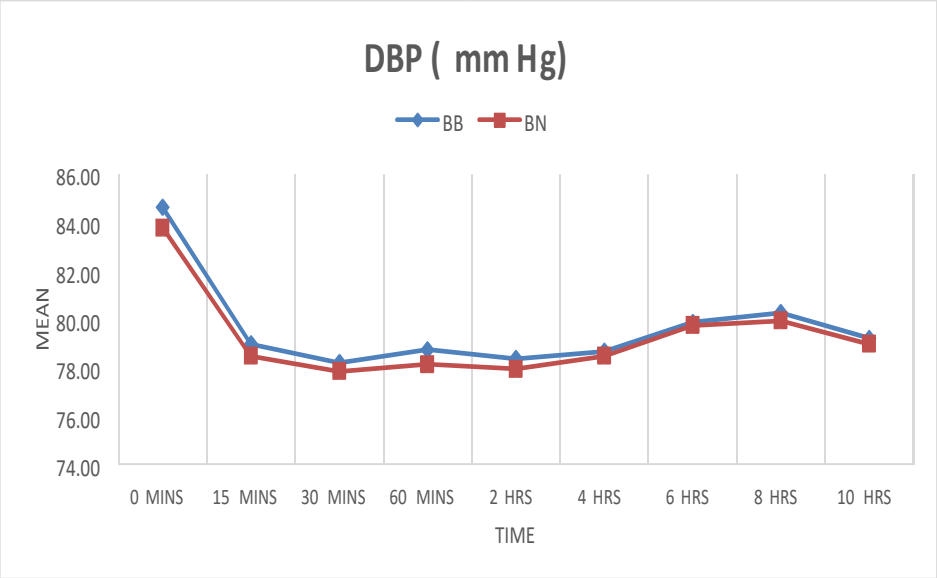

Fig. 5: Comparison of diastolic Blood Pressure among study groups

Complications	Group BB	Group BN	P-Value
Nausea & Vomiting	3 (10%)	2 (6.7%)	0.99
Pruritis	0	0	-
Sedation	0	0	-
motor block	0	0	-
Bradycardia	0	0	-
Hypotension	0	0	-
Respiratory depression	0	0	-
Shivering	0	0	-

Table 6: Comparison of complications between study groups

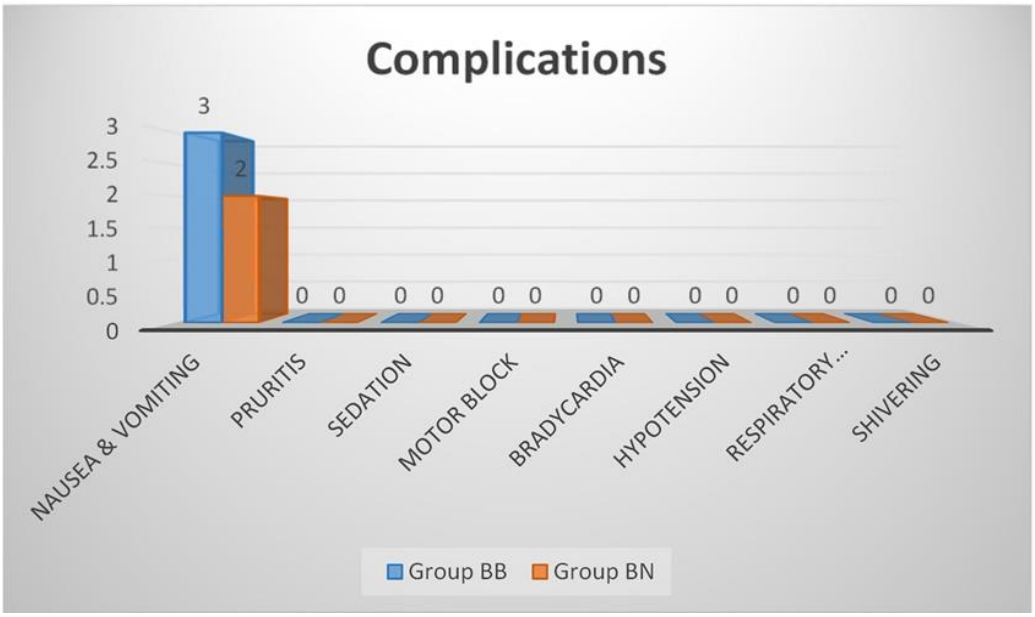

Fig. 6: comparison of complications between study groups

- **VAS SCORE:** The mean VAS score at 0 minutes was statistically insignificant between the two groups. Mean VAS scores at 15 minutes, 30 minutes, 60 minutes, 2 hours, and 4 hours were low in the group BB than that of group BN and statistically insignificant.
- **ONSET OF ANALGESIA:** In the present study, the mean time of onset of analgesia in the group BB was 6.9

± 0.99 minutes, and in the group, BN was 8.57 ± 1.25 minutes. The difference in the mean time of onset of analgesia between the two groups was statistically significant, with group BB having the faster onset of analgesia than group BN (6.90 minutes vs. 8.57 minutes).

- **DURATION OF ANALGESIA:** In the present study, the mean duration of analgesia in the group BB was 7.07 ± 1.66 hours, and in the group, BN, the mean duration of analgesia was 5.06 ± 0.75 hours. The difference in the mean duration of analgesia between the two groups was statistically significant ($p<0.05$), with group BB having a longer duration of analgesia than the group BN (7.07 ± 1.66 hours vs. 5.06 ± 0.75 hours).

IV. CONCLUSION

From our study, we conclude that, Butorphanol 2 mg with 0.125% bupivacaine provided faster onset of analgesia than with nalbuphine 10 mg with 0.125% bupivacaine.

Butorphanol 2 mg with 0.125% bupivacaine provided a longer duration of analgesia than with nalbuphine 10 mg with 0.125% bupivacaine.

From the present study, we conclude that butorphanol 2 mg with 0.125% bupivacaine appeared to be more effective than nalbuphine 10 mg with 0.125% bupivacaine for postoperative epidural analgesia, as it provided earlier onset of analgesia and prolonged duration of analgesia.

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