ORIGINAL RESEARCH PAPER

Anesthesiology

COMPARATIVE STUDY BETWEEN EPIDURAL NALBUPHINE AND EPIDURAL BUTORPHANOL FOR POST-OPERATIVE ANALGESIA IN TOTAL ABDOMINAL HYSTERECTOMY.

KEY WORDS: Epidural, Butorphanol, Nalbuphine, Post-operative analgesia.

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ABSTRACT

Introduction-Epidural opioids acting through spinal cord receptors improves the quality and duration of analgesia along with dose sparing effect with the local anaesthetics. The present study was designed to evaluate the efficacy and safety profile of epidurally administered butorphanol and nalbuphine combined with bupivacaine. **MATERIAL AND METHODS-** 80 patients of age group 30-60 years belonging to ASA and posted for total abdominal hysterectomy were randomized into two groups B and N of 40 each. Combined spinal epidural technique was adopted for all patients. Spinal anaesthesia was given with 4 ml of 0.5% heavy bupivacaine. In post-operative period the study drug was given through epidural catheter. Group B received Inj. butorphanol 2 mg and group N received Inj. nalbuphine 10 mg with 0.25% 6 ml bupivacaine. Duration and quality of analgesia, hemodynamic changes and side effects such as sedation, pruritus, PONV, respiratory depression and urinary retention were recorded and compared. **RESULTS-** The demographic data were comparable in two groups. Duration of analgesia was 185.63±17.22 mins and 159±14.33 mins in group B and N respectively and difference was found to be statistically extremely significant (p value<0.0001). Sedation scores and urinary retention were significantly higher in B group than N group. No other side effects were observed. **CONCLUSION-** Both butorphanol and nalbuphine were effective for relieving postoperative pain, however quality and duration of analgesia was more with butorphanol. However butorphanol causes more sedation and urinary retention than nalbuphine.

INTRODUCTION:

Epidural analgesia using local anesthetic agent is simple, effective and economical way of providing postoperative analgesia. Narcotic analgesics are commonly used as adjuvants to local anaesthetics in epidural anaesthesia. Narcotic analgesics hasten the onset, improve the quality of the block as well as prolong the duration of analgesia.

Nalbuphine is agonist at ƙ opioid receptors and antagonist at μ receptor. It is equipotent to morphine as an analgesic. Nalbuphine has ceiling effect on respiratory depression. Butorphanol is An agonist on κ receptor and either antagonist or partially agonist on μ receptor. It has high lipid solubility and affinity for opioid receptors. It has Ceiling effect on respiratory depression.

AIM:

To compare the duration of analgesia of nalbuphine and butorphanol.
To determine the occurrence of adverse effects with nalbuphine and butorphanol.
To study postoperative hemodynamics.

Inclusion criteria:

Patients undergoing total abdominal hysterectomy surgeries.
American Society of Anesthesiologists Grade I & II patients.

Patients were eligible for enrolment in the study if they were between age 30-60 years, had no clinically significant cardiovascular or central nervous system diseases.

Duration between 1.30hr to 2.30hr.

Exclusion criteria:

Known allergy to the study drugs.
Local infection.
Bleeding diathesis.
Patient refusal.

Materials and Methods:

This study was conducted after ethical committee clearance was obtained prior to the study. After explaining in details about the study protocols to all the patients and his/her attendants, sometime with multiple interactions, written informed consent was obtained from all the patients of all the study groups. A total of 80 patients were selected for the study, conducted from August 2017 to July 2018.

Type of study: It is a prospective randomized double-blind study.

Sample size: 80 patients of ASA I and II divided into 2 groups 40 each.

Group N: Epidural 0.25%bupivacaine 6 ml + nalbuphine 10 mg (1 ml)=7ml.

Group B: Epidural 0.25%bupivacaine 6 ml + butorphanol 2mg (1 ml)=7 ml.

Data Collection Technique: The subjects for present study were randomly selected from patients among who were admitted to tertiary care hospital for undergoing total abdominal hysterectomy surgeries by using simple random sampling (SRS) procedure.

Pre-anesthetic evaluation:

Patients were visited on the previous day of surgery. A detail clinical history was taken, detail general and systemic examinations were done. Basic laboratory investigations such as complete hemogram, bleeding time, clotting time, blood sugar, blood urea, serum creatinine and urine analysis, electrocardiography(ECG), and chest X-ray were carried out routinely in all patients.

The patients were explained about the epidural technique with catheter in situ and its advantages and disadvantages. They were also educated about the usage of linear visual analog scale(VAS) for assessment of the intensity of pain and were instructed to mark on the scale at the point which he/she felt was representative of their level of discomfort.

A written informed consent was taken from each patient.

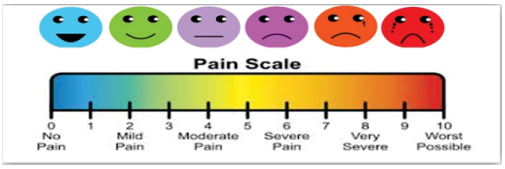
Premedication:

To allay the anxiety and apprehension, all patients were premedicated with Tablet Alprazolam 0.25 mg on the night before the surgery. The patients were also kept nil orally for 6

hrs before surgery.

Standard procedure of combined spinal and epidural anaesthesia was done. 3.5ml of 0.5% heavy bupivacaine was given intrathecally.Epidural was activated postoperatively when VAS Score will be ≥ 4 and study drug will be given.

Post-operative pain assessment- Post-operative pain assessment will be done at by using VAS scale.



Onset of analgesia-
The time interval from administration of the study drug (VAS score of >4) till VAS score came down to < 4.

Duration of analgesia-
The time interval between onset of analgesia (VAS score < 4), till patient complained of pain (VAS score > 4) when rescue medication was given.

Rescue Analgesia-
Epidural 0.125%bupivacaine 10 ml and 50 mg tramadol.

Side effects
Sedation: Quality of sedation after giving the study drug was based on sedation scoring.

Grade 0 - No sedation, patient wide awake
Grade 1 - Mild sedation, patient awake but drowsy.
Grade 2 - Moderate sedation, sleepy but arousable.
Grade 3 - Severe sedation, unarousable.

Hypotension: Fall of systolic BP by 20% from basal systolic BP.

Respiratory depression: RR < 10 breaths/minutes.

Bradycardia: A fall of HR by 20% from the basal.

Statistical analysis:
The data obtained was compiled by using an excel sheet. The sample size was calculated using power analysis. Continuous variables were analyzed using unpaired 't' test. The categorical data were compared by Chi square test. P value <0.05 was considered statistically significant.

Results:
Demographic profile: Both groups were comparable interms of age, sex, weight and height ,

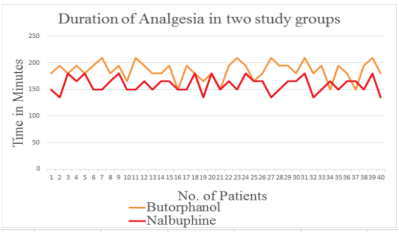
Variables	Age(years) Mean±SD	Weight(kg) Mean±SD	Height(cm) Mean±SD	Duration of Surgery (mins) Mean±SD
Group B	48.0±8.0	56.3±7.0	151.0±6.06	103.99±33
Group N	46.5±7.25	57.5±6.83	150±5.75	99.12±8.45
P value	0.338, NS	0.285, NS	0.197, NS	0.249, NS

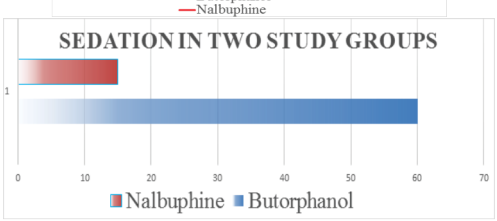
Block Characteristics :
Onset of analgesia- The mean time of onset of analgesia was 12.64 minutes and 14.33 minutes in Groups B and N, respectively (p < 0.05).

Duration of analgesia- The mean duration of analgesia was 185.63 ±17.22 minutes in Group B and 159.00 ±14.33 minutes in Group N (p < 0.0001) as sownl in graph.

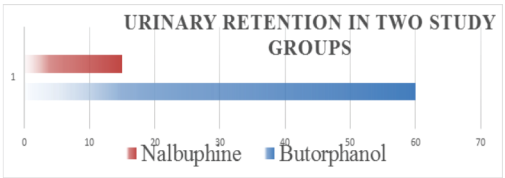
Time(mins)	Group B	Group N
Onset of analgesia	12.64±2.234	14.33±2.989
Level of analgesia	T9	T10
Duration of analgesia	185.63±17.22	159.00±14.33

Sedation-
This was the main side effect in butorphanol group which constituted 70% and 27.5% of the patients in Nalbuphine group. The majority of the patients had mild sedation, patient awake but drowsy. This was statistically significant (p<0.001) as compared to nalbuphine group.





Urinary Retention-
Urinary Retention In butorphanol group constituted 60% and 15% of the patients in Nalbuphine group.



Hemodynamic parameters:
There was no statistically significant change in the hemodynamic parameters in any group throughout the study period.

Pruritus:
No patients in nalbuphine group and butorphanol group had pruritus.

Respiratory Depression:
None of the patient in the study group had respiratory depression.

Nausea and Vomiting:
None of the patient in the study group had nausea and vomiting.

Discussion:
Since the discovery of opioid receptors in the spinal cord, the action of narcotics through opioid receptors has become more clearly understood. One of the opioid receptors, kappa are mainly involved with the mediation of visceral pain.The use of epidural opioids had become an increasingly popular technique for management of acute post-operative pain in recent times. Our results are consistent with the works of Malik *et al.*[1] who used 2 mg butorphanol epidurally for post-operative analgesia and found duration to be 5.59±1.15Hrs. Chatrath *et al.*[2] studied the effects of epidural nalbuphine and tramadol and concluded that patients were more comfortable after nalbuphine epidurally since they complained of lesser side effects. No case of respiratory depression was observed in any group, consistent with study by Malik et al.[1]Palacious et al and Ackerman et al[3,4] reported incidence of pruritus to be 1.4% and 6.7% respectively but none of the patients in our study developed this complication. Bharati et al and Parikh et al[5,6] also did not demonstrate pruritus in any of their patients. Sedation was observed in butorphanol group consistent with the study of Venkatraman *et al.*[7] who observed sedation in patients receiving epidural butorphanol.

CONCLUSION:

Opioid analgesics with local anesthetics are safe, effective and reliable method of post-operative pain relief.

Patients receiving butorphanol have longer post operative analgesia than patients receiving nalbuphine.

Butorphanol causes more post-operative sedation and urinary retention than nalbuphine.

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