COMPARISON OF INTRATHECAL FENTANYL WITH HYPERBARIC BUPIVACAINE ADMINISTERED AS A MIXTURE AND SEQUENTIALLY IN LOWER ABDOMINAL SURGERIES

Dr.B.KIRUTHIKA,
PG, DEPT OF ANAESTHESIOLOGY,
VINAYAKA MISSIONS MEDICAL COLLEGE, KARAikal

Dr.K.CHERAN,
PROFESSOR&HOD, DEPT OF ANAESTHESIOLOGY,
VINAYAKA MISSIONS MEDICAL COLLEGE, KARAikal

DR.V.SURESH KUMAR,
PG, DEPT OF ANAESTHESIOLOGY,
VINAYAKA MISSIONS MEDICAL COLLEGE, KARAikal

ABSTRACT

BACKGROUND AND OBJECTIVES

Subarachnoid blockade is the common form of centnerarachxial blockade performed for lower abdominal surgeries. In order to maximize quality of anaesthesia and post operative analgesia, a number of adjuvants have been added to spinal local anaesthetics. This double blinded study compares hemodynamic, duration of analgesia and side effects of sequentially administrated and combined administration of bupivacaine with fentanyl.

METHODS

100 patients of either sex, age group of 18-60 years, ASA I and II, posted for elective lower abdominal surgeries were randomly selected. One group received 35 micrograms and 3 ml of bupivacaine sequentially in two different syringes and the other received in a single syringe.

RESULTS

We found that onset of sensory blockade was faster in group A than in group B. Hemodynamic parameters were comparable. Duration of analgesia was increased in group A. side effects like nausea, vomiting, hypotension, pruritis and mild sedation were observed in both the groups and were comparable.

CONCLUSION

Early onset of sensory and motor blockade, and longer duration of analgesia favours the sequential use of hyperbaric bupivacaine and fentanyl.
INTRODUCTION

Subarachnoid blockade is the common form of centriseuraxial blockade performed for lower abdominal surgeries. New trends in subarachnoid block are use of adjuvants which reduce the nature of complications as well as improve the anesthetic effect. In order to maximize post operative analgesia, a number of adjuvants have been added to spinal local anesthetics.

Intrathecal opioid are easily available and cost effective, its administration demonstrated to provide effective post operative analgesia and they augment the block.

Commonly, adjuvants are mixed with local anaesthetics in a single syringe before injecting the drugs intrathecally. Mixing of these drugs changes the density of both drugs, thus affecting their spread in the cerebrospinal fluid.

Density is known to influence the spread of local anaesthetics, but the effect of adjuvant solution density on its movement in the CSF has not been studied extensively. This spread and action of the anaesthetic solution is often influenced by a number of factors including the temperature of the solution, patient position during and after spinal injection, pH and density of the solution, volume of the drug injected and height of the patients.

The current study aimed to compare the effect of spinal injection of hyperbaric bupivacaine and fentanyl separately to the standard injection of mixed fentanyl with hyperbaric bupivacaine.

MATERIALS AND METHODS

The study was conducted on 100 patients aged between 18 to 60 years belonging to ASA Grade I and II of both the sexes posted for elective lower abdominal surgeries. The study was conducted at vinayaka mission medical college, karaikal.

INCLUSION CRITERIA

- American society of anaesthesiologist 1&2
- Age group 18-60 years
- Both sexes
- BMI 18.5-30, height 145CMS-180cms
- Patient undergoing elective lower abdominal surgeries

EXCLUSION CRITERIA

- Patients with history of adverse response to fentanyl or bupivacaine
- Pregnant patients
- Patients receiving CNS depressant drugs
- Patients with peripheral or central neurological, cardiac, respiratory, hepatic, renal disease
- Patients having other contraindications to sub arachnoid block

Institutional ethical committee approval was obtained for the study.

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 lumbar puncture site. Following investigations were carried out in all patients:

Hemoglobin%

Bleeding and Clotting time

Random or fasting blood sugar
Blood urea

Serum Creatinine

Urine analysis for albumin, sugar and microscopy

Electrocardiogram and Chest X-ray as and when required.

All the patients were graded according to American Society of Anesthesiologists classification.

After explaining the anaesthetic procedure to the patients, informed written consent was taken to include them in the study. All patients were prescribed 0.5 mg of Alprazolam and Ranitidine 150mg orally the previous night. Patients were advised to be nil orally from 10 pm onwards on the previous day of surgery. On the day of surgery intravenous access was secured with 18 gauge venous cannula for fluid administration before the block. NIBP, ECG, Pulseoximeter monitors were connected & baseline pulse rate, blood pressure, ECG, respiratory rate and SPO2 were recorded.

Patients were randomly allocated to 2 groups. All blocks were performed by the person conducting the study. All patients were given 500ml of Ringers lactate or Isotonic saline before performing the spinal anaesthesia.

Under strict aseptic precautions lumbar puncture was performed at L2-3 interspace with 25G Quincke needle, after preparing with local infiltration of 2mL of 2% lignocaine. After free flow of cerebrospinal fluid, Group A (study group) received intrathecal fentanyl 35mcg and bupivacaine 0.5% 3ml in separate syringe and Group B (Control) received intrathecal fentanyl 35mcg and bupivacaine 0.5% 3ml in same syringe. The patient was turned to supine position after injection.

After the subarachnoid blockade, all the patients were monitored for pulse rate, blood pressure, respiratory rate, oxygen saturation at 2, 4, 6, 8, 10, 15, 30, 45, 60, 90, and 120 minutes and onset of sensory and motor blockade intra-operatively and every hour till 4 hours post-operatively until the effect of subarachnoid block was disappeared. During the procedure all the patients were infused with appropriate quantity of intravenous fluids. Any side effects were noted.

Sedation score, Assed by scoring system of Campbell. The effectiveness of pain relief in the post operative period was assessed by Visual Analogue Score, motor blockade by bromage scale.

Hypotension was treated with the following measures:

a) Oxygen via ventimask 6 litres / minute

b) Rapid infusion of intravenous fluids

c) Ephedrine intravenously at 6mg increments

d) Injection Atropine 0.6mg if associated with bradycardia.

Bradycardia was treated by the following measures:

a) If the heart rate was reduced to <60/minute, associated with any hypotension –

Inj. Atropine 0.6mg I.V.

b) If the heart rate reduced to <50/minute – Inj. Atropine 0.6mg I.V.

c) Rapid infusion of intravenous fluids

Nausea & vomiting were treated with Inj. Ondansetron 4mg I.V.
Shivering was treated with warm drapes and warm intravenous fluids.

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

Delayed complications – If present were recorded

Urinary retention

Transient neurological symptoms

Post dural puncture headache.

If patient experiences pain, conversion to general anaesthesia will be done and those cases are included in the study.

RESULTS

For parametric data, Student's t test and for non-parametric data, Mann-Whitney U test was used. Chi-square test, a non parametric test was also used to find the association between variables. IBM SPSS Version 20 used for statistical analysis.

Table 1. Demographic factors

<table>
<thead>
<tr>
<th>Mean ± SD</th>
<th>Group A</th>
<th>Group</th>
<th>P value, Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td>36.1±3.8</td>
<td>37.5±2.5</td>
<td>0.642 NS</td>
</tr>
<tr>
<td>Height</td>
<td>162±2.9</td>
<td>161±3.8</td>
<td>0.589 NS</td>
</tr>
<tr>
<td>Weight</td>
<td>62±2.2</td>
<td>63±4.1</td>
<td>0.912 NS</td>
</tr>
<tr>
<td>BMI</td>
<td>23±3.6</td>
<td>24±1.4</td>
<td>0.662 NS</td>
</tr>
</tbody>
</table>

There is no statistically significant difference in the demographic factors and hemodynamic parameters of patients in study and control group.

Chart 1. Pulse rate distribution of group A and B
The mean systolic BP of group A is 115.55 ± 3.823 and group B is 113.13 ± 5.614, p value 0.58, not significant.

Chart 2. Systolic blood pressure distribution of group A and B

The mean diastolic BP of group A is 70.24 ± 2.55, group B is 69.00 ± 2.89, p value 0.83, not significant.

Chart 3. Diastolic blood pressure distribution of group A and B
Onset of sensory and motor block is early in study group then control group.

Duration of analgesia is increased in study group compared to control group and is statistically significant

DISCUSSION

The aim of the study is to find the duration of analgesia and hemodynamic effects after administration of premixed and sequential use of Hyperbaric Bupivacaine and fentanyl.

We found that separate intrathecal injection of fentanyl and hyperbaric bupivacaine provided significant improvement in the quality of sensory block

Sachan et al had noticed a significant fall in heart rate with the lowest values after 45 min after administration of SAB in a similar study using Clonidine. Also there was an overall trend of fall in systolic blood pressure (SBP) in all the groups except during time intervals of 20 and 25 min.

Desai et al studied two groups each 24 parturients received spinal injection for CS. The first group received 10 mg hyperbaric bupivacaine plus morphine 100 μg plus fentanyl 15 μg, mixed in a syringe prior to administration. The second group received 10 mg bupivacaine through one syringe, followed by morphine 100 μg plus fentanyl 15 μg through a separate syringe. They reported that patients received mixed medications had higher levels of sensory block to cold than those received separate injections and may be associated with the higher postoperative opioid requirement.
Atalay et al. compared 10 mg hyperbaric bupivacaine intrathecally with 5 mg plain bupivacaine plus 35, 30, or 25 mg of meperidine administered sequentially. They concluded that sequential administration of 5 mg plain bupivacaine and 25 mg meperidine intrathecally provided better blood pressure stability and a lower incidence of side-effects than 10 mg hyperbaric bupivacaine alone.

The mean time regression of the sensory and motor block was faster in the control group than the study group. In a similar study by using Clonidine, the regression of the sensory and motor block was slower in the mixture group compared administration of Hyperbaric bupivacaine and clonidine in spate syringe groups. Another study by Sachan also reported similar findings. Sharma et al also noticed that the regression of sensory and motor block was slower in the sequentially administered group than the premixed group. The time of rescue analgesia was more prolonged in the study group than control group in this study.

CONCLUSION

In this study, the hemodynamic effects and side effects were fewer, earlier onset of sensory and motor block was observed in the sequentially administered group than the pre mixed group. Hence we conclude sequential use of bupivacaine with fentanyl is beneficial than premixed group.

REFERENCES

5. Bansal N, Premixed Versus Sequential Administration of Intrathecal Fentanyl and Bupivacaine in Elective Caesarean Section- a Comparative Study, ind journal of applied research, Volume : 6 | Issue : 2 | FEBRUARY 2016 | ISSN - 2249-555X