COMPARATIVE STUDY OF BUPIVACAINE WITH FENTANYL VS BUPIVACAINE WITH FENTANYL PLUS MORPHINE IN SPINAL ANAESTHESIA FOR LOWER SEGMENT CAESAREAN SECTIONS

Keisham Upendra Singh¹, Sukham Thoibahenba Singh², Sonia Nahakpam³, Linthoingambi Samjetsabam⁴, Zarina Waheb⁵, Laishram Dhanachandra⁶

¹Associate Professor, Department of Anaesthesiology, JNIMS, Imphal, Manipur, India.
²Associate Professor, Department of Anaesthesiology, JNIMS, Imphal, Manipur, India.
³Postgraduate Trainee, Department of Anaesthesiology, JNIMS, Imphal, Manipur, India.
⁴Postgraduate Trainee, Department of Anaesthesiology, JNIMS, Imphal, Manipur, India.
⁵Postgraduate Trainee, Department of Anaesthesiology, JNIMS, Imphal, Manipur, India.
⁶Postgraduate Trainee, Department of Anaesthesiology, JNIMS, Imphal, Manipur, India.

ABSTRACT

BACKGROUND

Anaesthesiologists all over the world are facing challenges to manage increasing number of caesarean deliveries. Central neuraxial techniques of subarachnoid blockade with 0.5% Bupivacaine heavy solutions in different doses are generally employed.

MATERIALS AND METHODS

Sixty parturients coming for non-urgent caesarean deliveries were randomized into 2 groups of 30 each; Group I receiving 7.5 mg Bupivacaine heavy plus 16 µg Fentanyl and Group II receiving 7.5 mg Bupivacaine heavy plus Fentanyl 16 µg & Morphine 125 µg, the volume of solutions being 2 ml in both the groups.

RESULTS

Demographic data, pre-operative, intra-operative & post-operative vitals, characteristics of motor blockade and complications were comparable in both the groups. However sensory blockade (analgesia) in Group II was much longer and post-operative analgesic consumption in the first 24 hours were much lesser in Group II.

CONCLUSION

It has been concluded that addition of Fentanyl 16 µg and Morphine 125 µg to Bupivacaine 7.5 mg is a very good option for non-urgent Caesarean deliveries.

KEYWORDS

Intrathecal Morphine; Fentanyl; Bupivacaine; LSOS.

on one end and addition of 125 µg of Morphine to this mixture on the other end, comparing the hemodynamic parameters, maternal and foetal side-effects and duration of post-operative analgesia.

MATERIALS AND METHODS
We used a double blind randomized controlled trial. Randomization in a ratio of 1:1 was carried out using a computer-generated random process with concealment. Whenever a patient came in, the allocation was informed to the investigator by a third party from the Community Medicine Department of the Institute. The drugs in both intervention as well as controlled arms were similar in physical characteristics, volume and were prepared by another person, who was not involved in the study. The assessors (investigators) were also blinded.

The sample size of 60 patients for the study was taken for convenience. All term (>36 weeks) singleton pregnant women opting for elective caesarean section were included in the study. Pregnant women with contraindication to sub-arachnoid block (SAB) with the study drugs, with morbid and comorbid conditions like PIH, eclampsia, multiple pregnancy, placenta praevia and, other systemic diseases with physical status ASA III and above were excluded. All eligible willing participants were recruited and numbered consecutively. Pregnant women posted for elective caesarean section in the Department of Anaesthesiology, between July 2018 and September 2018 had been recruited.

Parturients were cannulated with 18G canula and ringer lactate solution started. After connecting to a standard monitor to record ECG, SpO2 & NIBP and with aseptic and antiseptic measures, the primary investigator located and punctured the dura at L3-L4 level with a 25G Quincke needle while the subject was lying in right lateral decubitus position. After confirmation of free flow of CSF, the blinded primary investigator gave a mixture of the following solutions: 1.5 ml (7.5 mg) of preservative free Bupivacaine heavy + 16 µg of Fentanyl in Group I and 1.5 ml (7.5 mg) of preservative free Bupivacaine heavy + 16 µg Fentanyl + 125 µg Morphine in Group II. The volume of the mixture in both the groups was made 2 ml by preparing the mixture on one end and addition of 125 µg of Morphine to this mixture on the other end, comparing the hemodynamic parameters, maternal and foetal side-effects and duration of post-operative analgesia.

Intraoperative vitals were recorded at every 5 minutes interval and episodes of hypotension (mean arterial pressure <60 mm Hg) was treated by intravenous (IV) mephentermine, in 3 mg aliquots and bradycardia (< 50/min) associated with fall of mean arterial pressure < 60 mmHg, by 0.2 mg glycopyrrolate IV. Intraoperative complaints of visceral pain were recorded and treated by judicious use of IV midazolam (0.5 to 1 mg).

Intramuscular (IM) Inj. Oxytocin 10 mg was given just before delivery of the baby and inj. Methylgometrine 0.2 mg IM was given as and when asked by the obstetricians. The baby's Apgar Scores at 5 min of delivery were recorded and compared.

Post-operatively subjects were followed up to the first 24 hours, the time to request the first analgesic was recorded and Inj. Diclofenac Sodium 75 mg IM was given as rescue analgesic and total doses of diclofenac in the first 24 hours were recorded. Side-effects such as nausea & vomiting and pruritus were recorded and symptomatic treatment with ondansetron and antihistaminics were prescribed whenever required. Serious side-effect of respiratory depression was closely observed, and Injection Naloxone was kept ready for any eventuality. Since all of the subjects were catheterized for the first 24 hours urinary retention as a side effect of intrathecal opioids could not be assessed.

Data were summarized using mean (SD), frequency and proportions. Proportions were compared using Chi square and continuous variables were compared using independent 't' test. Data were entered in Microsoft Excel and analysed using IBM SPSS version 21. A p-value of less than 0.05 was considered statistically significant.

Institutional Ethics Committee approved the study. Written informed consent was obtained from each participant. Data were accessible only to the investigators and analysis team.

RESULTS
Demographic data like age, weight and height of the subjects and base line haemodynamic parameters are expressed as mean ± standard deviation (SD) & are shown in Table 1. There was no statistically significant difference.

<table>
<thead>
<tr>
<th>Score</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Complete block (Unable to move feet to Knee)</td>
</tr>
<tr>
<td>2</td>
<td>Almost complete block (Able to move feet only)</td>
</tr>
<tr>
<td>3</td>
<td>Partial block (Just able to move Knees)</td>
</tr>
<tr>
<td>4</td>
<td>Detectable weakness of hip flexion while supine (Full flexion of knees)</td>
</tr>
<tr>
<td>5</td>
<td>No detectable weakness of hip flexion while supine</td>
</tr>
<tr>
<td>6</td>
<td>Able to perform partial knee bend</td>
</tr>
</tbody>
</table>

Table 1. Demographic Profile & Baseline Vitals of the Participants in Study Groups

Apgar Score (AS) of the newborns, Intra-operative pulse rates, mean arterial pressure, use of vasopressors and anticholinergics in both the group were comparable and reproduced in Table 2. The median of the AS was 8; none of
the new born had AS less than 7 at 5 minutes. Two subjects in Group I and 1 subject in Group II had discomfort on exteriorization of uterus and successfully treated with 1 mg Inj. Midazolam IV. There was no statistically significant difference in any of the observations/parameters. Low dose Bupivacaine alone or in combination with Bupivacaine doses < 0.3 mg of fentanyl for caesarean sections and observed that increasing Bupivacaine dose increases the time for two segment sensory regression and also the duration of analgesia. But the incidence of hypotension was increased with increasing doses of Bupivacaine. In Low dose Bupivacaine group women could be made ambulatory at the earliest and also had better hemodynamic stability.

C Sibilla et al\cite{16} studied combination of 12-14 mg Bupivacaine with Fentanyl 25 µg alone or in combination with Morphine 100 µg for caesarean sections and could not demonstrate any benefit of combination of both opioids.
Likewise, Karaman S et al,19 concluded in their study that addition of intrathecal fentanyl 25 µg plus intrathecal morphine 100 µg to 10 mg bupivacaine for caesarean sections did not show any advantage of the combination and analgesia with only intrathecal morphine and bupivacaine was much superior. In these two studies, they had used a much larger dose of Bupivacaine which alone was more than enough for the procedure and which had masked the rapid onset of subarachnoid block made by intrathecal fentanyl. Weigl et al20 in a similar study, concluded that combination of Morphine 100 µg and 25 µg Fentanyl to different doses of Bupivacaine, shortens the incision time and much improved the perioperative analgesia. With intrathecal fentanyl, pain relief is obtained within 10 minutes while intrathecal morphine takes about 60 minutes for onset of its analgesic action.21

In our study, we have fully utilized the synergistic effect of intrathecal fentanyl on rapid onset of analgesic sensory blockade and prolonged analgesic effect of intrathecal morphine with reduced dose of Bupivacaine and Fentanyl. A dose of Morphine which is not too high is selected to avoid high incidences of side-effects, to enable early ambulation but to obtain a prolonged pain free post-operative period.

CONCLUSION
Addition of Fentanyl 16 µg and Morphine 125 µg to 0.5% hyperbaric Bupivacaine 7.5 mg was effective for spinal anaesthesia in caesarean section surgeries, with minimal side effects, enabling early ambulation and prolonged analgesia.

Combinations of 7.5 mg 0.5% Bupivacaine with Fentanyl 16 µg were also beneficial in caesarean section surgeries, with moderate prolongation of analgesia. Addition of opioids such as fentanyl and morphine did not produce any adverse effects either in the mother or the neonate.

REFERENCES