

A comparative study of post-operative analgesia after caesarean section with intrathecal hyperbaric bupivacaine combined with different doses of buprenorphine

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Abstract

Background: Post-operative pain relief after caesarean section is challenging to both anesthetists and obstetricians. Injection buprenorphine can be used intrathecally for post operative analgesia. **Aim:** the aim of the study was to compare the efficacy of two different doses (30ug and 60ug) of buprenorphine intrathecally with hyperbaric bupivacaine for post operative pain relief in caesarean section. **Methods and Materials:** A prospective randomised controlled study was done on 60 subjects undergoing elective caesarean section where in two groups were made, Group A (n=30) and Group B (n=30) who received inj bupivacaine 0.5% hyperbaric 2ml plus inj buprenorphine 30ug and inj bupivacaine 0.5% hyperbaric plus inj buprenorphine 60ug intrathecally respectively. Following parameters were observed, onset and duration of sensory block, postoperative pain measured on VAS (visual analogue scale), rescue analgesia requirement, maternal side effects. **Results:** Unpaired t test and Chi square test were used for statistical analysis. Duration of analgesia was longer significantly in group A compared to group B. rescue analgesia requirement and VAS were significantly lower in group A as compared to group B. No major side effects were seen. **Conclusion:** Increasing the dosage of buprenorphine intrathecally increased the duration and quality of post operative analgesia. with no major adverse effects.

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INTRODUCTION

Pain during surgery and postoperatively as well has been distressing to the patients and doctors as well. Adequate pain management after caesarean section prevents adverse effects on various systems of mother and facilitates feeding and taking care of babies properly. Eisenac *et al.* In his studies says there is increased risk of pain which leads to

increased risk of post partum depression in women in post partum.¹ Subarachnoid block has been main stay of anesthetic technique for caesarean sections.² Opioids remain main stay adjuncts in subarachnoid blocks by virtue of reducing the dose of local anesthetics, prolonging the duration of analgesia.³ Buprenorphine is an agonist-antagonist opioid, centrally acting with both spinal and supraspinal components of analgesia.^{5,6} It has ceiling effect on respiratory depression but not on analgesia.⁷ It has high lipid solubility, high affinity for opioid receptors, and long duration of action makes it a good choice as an adjuvant in intrathecal local anesthetics.^{8,9} Buprenorphine is easily available in preservative free preparation which is compatible with cerebrospinal fluid. Buprenorphine is used in doses between 30ug and 60ug intrathecally with bupivacaine for post operative analgesia without sensory and motor blockade.^{3,8,9} The aim of the study was to compare efficacy of two different doses

(30 and 60ug) buprenorphine intrathecally along with bupivacaine for post operative pain after caesarean section.

MATERIALS AND METHODS

This was a prospective randomised controlled study, conducted at RIMS/RGSSH tertiary hospital after obtaining institutional ethical committee permission.

Sixty ASA Class I and II Parturients posted for elective caesarean section between the ages 20 to 35 were chosen for the study and they were made in to two groups group A and group B of each 30.

Inclusion criteria:

1. age between 20-35 years
2. elective caesarean sections

Exclusion criteria:

1. coexisting systemic illness
2. allergic to local anesthetics and opioids

Preanesthetic evaluation was done a day before surgery .Overnight fasting was advised after 10pm.On the morning of surgery 20G iv line secured, inj.ranitidine slow iv 25mg given and inj.metoclopramide 10 mg iv given 1hour before the surgery. IVF RL given at 20ml/kg as preloading on OT table. All monitors connected to the patient, Spo2, Heart rate, BP monitored, the patient was put in sitting position, inj.bupivacaine 0.5% h 2cc plus inj.buprenorphine 30ug and inj.bupivacaine 0.5% (H) plus inj.buprenorphine 60ug given intrathecally to group A Aand group B respectively. BP, pulse rate and Spo2 monitored every 2 minutes for half an hour and every 5 minutes there after. Level of sensory was checked by pin prick and taken as time of onset of analgesia. surgery started when T₄ level sensory block reached. Peak level of sensory block checked during the middle of the surgery. Neonatal status (APGAR score)was assessed at 1 minute and 5 min after delivery of the baby. Completion of surgery was taken as postoperative 0 hour. No analgesic and sedative given intraoperatively. BP, Pulse rate, Respiratory rate and Spo2 monitored every 15 min post operatively for 24 hours. time of onset of ±pain corresponding to vas scale of more than 4 was considered as onset of requirement of rescue analgesia. inj.diclofenac 50 mg im given as rescue analgesic and number its requirements noted down. Side effects like nausea, vomiting, respiratory depression <10/min monitored and noted down. Datas observed were entered in master chart and data was analysed with chi square and unpaired t test.

RESULT

The two groups were comparable with respect to Age, Height and Weight.

Table 1: Demographic Data

	Group A	Group B
Age (years)	254±.02	27±3.06
Height(cms)	155±4.01	156±2.07
Weight(kg)	58±2.01	54±0.07

The onset of sensory block/analgesia in Group A is longer than Group B which is statistically significant. The duration of block was longer in Group B when compared to Group B which is also statistically significant difference.

Table 2: Onset And Duration of Sensory Block

	Group A	Group B	Group A vs Group B(p)
Onset of sensory block	3.70±0.33	3.22±0.4	0.011
Duration analgesia	5.9±1.15	9.4±1.12	0.0001

The maximum pain score attained in Group B is higher than Group A showing statistical significance.

Table 3: Maximum Pain Score

Max pain score over 24 hours	Group A	Group B
1	0	0
2	0	3
3	1	2
4	7	11
5	10	15
6	1	2

The number of rescue analgesic requirement was more in Group A when compared to Group B. There is a statistically significant difference between two groups

Table 4: Mean Number of Rescue Analgesics

	Group A	Group B	Group A vs group B(p)
Number of rescue analgesics	1.63	1.01	0.03

Regarding side effects there was not much significant difference between the groups and no respiratory depression seen in any of the groups.

Table 5: Side Effects Comparison of Incidence of Side effects

Groups compared	Nausea and vomiting
Group A and B	0.34

DISCUSSION

Pain relief post caesarean section has been challenging to both anesthetist and obstretician as it facilitates early mobilisation of the patient, comforts patient and proper feeding of the baby and early discharge of the patient. Adjuants like opioids when given along with local anesthetics intrathecally reduces post operative pain and recue analgesics requirement with minimal side effects. inj buprenorphine can be used as adjuant with local anesthetics intrathecally to achieve the above goal to provide postoperative analgesia.^{5,10} This study was conducted on 60 patients divided in two Groups A and B, 30 each to assess the efficacy of two different doses of buprenorphine intrathecally for post operative analgesia in

caesarean section. Post operative analgesia was 5.9 hours in group A and 9.4 hours in group B. there was statistically significant prolonged analgesia in Group B than Group A. The similar study was conducted by Dixit *et al.* in caesarean section in which mean duration of analgesia was 8.2 hours with inj.buprenorphine 60ug.In a study done by Capogna *et al.*, mean duration of analgesia was 7.2 hours with intrathecal dose of buprenorphine 45ug^{12,14}.The results of the present study correlates with the above studies.¹⁴ The number of rescue analgesic requirements were 1.63 and 1.01 in Group A and Group B in our study which is comparable to the study done by Singh *et al.* which showed significantly reduced requirement of rescue analgesia with addition of 60ug of intrathecal buprenorphine.⁸ The side effects such as nausea ,vomiting and respiratory depression were not so statistically significant when compared the both Groups. Capogna *et al.* ,in his study found 36% nausea and vomiting with 30ug buprenorphine and 46% with 45ug of buprenorphine but in our study it was lower than his study.⁸ All babies had normal APGAR Score and none developed respiratory depression.

Summary

Our study shows that addition of adjuncts like inj buprenorphine intrathecally prolongs the duration of analgesics without causing any major side effects and can be safely used.

CONCLUSION

Our study demonstrates that addition of increasing doses of inj.buprenorphine as adjuant to hyperbaric bupivacaine prolongs the duration of post operative caesarean section without any major side effects to both mother and baby, hence inj.buprenorphine as an adjuant can be used safely

as an effective method of post operative analgesia in caesarean section.

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