ORIGINAL PROF-769

LOWER ABDOMINAL & PELVIC SURGERY;
ADDITION OF PETHIDINE TO BUPIVACAINE FOR SPINAL ANAESTHESIA

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ABSTRACT ... draslam201@hotmail.com **Objectives:** To investigate the effect of adding pethidine to intrathecal bupivacaine on the duration of postoperative analgesia in patients for lower abdominal and pelvic surgery under spinal anaesthesia. **Design:** A randomized placebo controlled observational study. **Place and duration of study:** The study was conducted in department of anaesthesiology and intensive care, combined military hospital Gujranwala Cantonment from September 2000 to March 2002. **Subjects & Methods:** A total of 80 patients were included in the study with ASA class II & III. Patients were divided into two equal groups. 40 patients received intrathecal injection of 0.75% hyperbaric bupivacaine 1.8 ml with 0.2 ml of Pethidine. Where as 40 patients in placebo group received intrathecal injection of 0.75% hyperbaric bupivacaine1.8ml with 0.2ml of saline. Intraoperative adverse effects and effective duration of post operative analgesia was recorded. **Results:** The duration of effective analgesia was greater in group II 180-287 minutes(min) (mean 231 min) compared with group I 100-135 min (mean 121 min). The incidence of nausea and vomiting was greater in-group II (35%) as compared to group I (7.5%). **Conclusion:** Addition of 10 mg pethidine to intrathecal hyperbaric bupivacaine is associated with prolonged analgesia but with greater intraoperative nausea and vomiting.
Key Words: Pethidine, Intrathecal, Hyperbaric, Bupivacaine, Prostaectomy, Analgesia.

INTRODUCTION

This study was carried out at Combined Military Hospital Gujranwala Cantonment from September 2000 to March 2002. Patients scheduled for Hemiarthroplasty and Dynamic hip screw (DHS) were given 2ml hyperbaric bupivacaine 0.75% intrathecally for spinal anaesthesia. Few patients complained of discomfort and pain during the procedures and analgesia was supplemented with intermittent small doses of intravenous ketamine. Pethidine 10 mg was added to hyperbaric bupivacaine to enhance the effect and duration of analgesia and the results were encouraging. Based on this observation this study was conducted. Although a local anaesthetic solution may be used alone for spinal anaesthesia, opioids may also added. When the lipophilic opioids fentanyl and sufentanil were added to local anaesthetic. Early postoperative analgesia was prolonged compared with local anaesthetic alone[1-3]. In these studies, the reported time to first postoperative analgesic ranged from 4 to 13 hrs[4]. For morphine, which is more hydrophilic, postoperative analgesia may extend up to 24 hrs[5-7]. Pethidine is an

opioid of intermediate lipid solubility and is unique in having significant local anaesthetic properties. It has been used as the sole agent for spinal anesthesia for Caesarean section. However few data are available on the effect of adding pethidine to hyperbaric bupivacaine in patients having elective Caesarean section under spinal anaesthesia. Outcome measurement was the requirement of early postoperative analgesia and intraoperative side effects.

PATIENTS & METHODS

Total number of 80 patients, age between 61 years to 75 years, ASA Class-II and III scheduled for open prostatectomy and inguinal hernia under spinal anaesthesia were included in this study. These patients were divided into two groups each group having 40 patients. Patients with coagulopathy, those who cannot be positioned laterally, unwilling for spinal anaesthesia and history of allergy from local anaesthetics were excluded. Preanaesthetic evaluation was done a day earlier to surgical procedure. Diazepam 5 mg orally was prescribed in the evening and cimetidine 400 mg in the morning on the day of operation.

An 18 G peripheral I.V Cannula was inserted and 10 ml/Kg body weight lactated Ringers solution was administered as preload. Solutions for spinal anaesthesia were prepared under strict sterile condition by anaesthetist. 1.8 ml of 0.75% hyper baric bupivacaine was drawn in 5 ml syringe and to which was added 0.2 ml saline for group I and 0.2 ml pethidine for group II. The dose of 10 mg pethidine was chosen because this dose has previously been used intrathecally[12,13]. After skin disinfection local anaesthesia using 1% Lignocaine plain was infiltrated. Lumbar puncture was performed in midline with 23 G pencil point spinal needle at Lumbar (L3, 4) intervertebral space while patient was placed in lateral position. The lateral approach was adopted in those patients where midline approach failed. After confirming free flow of cerebrospinal fluid (CSF) solution prepared for spinal anaesthesia was administered over 15 seconds according to the group. Patients were then placed in supine position.

Table-I. ASA Classification and Types of Operations

	Group-I (n-40)	Group-II (n-40)
ASA Class	**II & III**	**II & III**
Operations		
a. Open Prostatectomy	18	17
b. Inguinal hernia	22	23

Continuous monitoring was performed including ECG, Pulse oximetry and Non-invasive blood pressure (NIBP) monitoring at 3 minutes (min) interval throughout the procedure. Hypotension was treated with I.V dopamine infusion 20 ug/kg/min. Nausea and vomiting was treated with metoclopramide 10 mg I.V after excluding hypotension.Monitoring during postoperative period was extended to 24 hours and included ECG, Pulse, Oximetry, NIBP and respiratory rate at 10 min intervals. Time for Ist analgesia requirement was recorded in each patient. Side effects like nausea, vomiting, hypotension and shivering were documented.

RESULTS

80 patients in total were included in study and 40 patients were placed in each group. Written consent was obtained from each patient after explaining the procedure to all these patients. In-group I time to first analgesia requirement ranged between 100-135 min with mean 121.35 min (SD 9.25) and in-group II it was 180-287 min with mean 230.75 min (SD 35.64). 3(7.5%) patients complained of nausea and vomiting in-group I as compared to 11 (27.5%) patients in-group II. Shivering was observed in one patient (2.5%)from group I and two patients (5%) from group II. Postoperative side effects like nausea, vomiting and pruritus were mild in both the groups. No patient in both groups showed respiratory depression. Statistical data was subjected to standard normal distribution to calculate mean and SD.

Table-II. Minimum (Min) and Maximum (Max) duration of effective analgesia in min. with mean and (SD)			
	Min Time for fist analgesia (in min)	Max Time for first analgesia (in min)	Mean and SD (in min)
Group A	100	135	121.35 (9.25)
Group B	180	287	230.75 (35.64)

Table-III. Incidence of adverse intra-operative events		
Adverse events	Group-I (n=40)	Group-II (n=40)
Hypotension	14(35%)	11(27.5%)
Nausea/Vomiting	3(7.5%)	14(35%)
Shivering	1(2.5%)	2(5%)

DISCUSSION

We found that addition of pethidine to intrathecal hyperbaric bupivacaine increased the mean duration of effective analgesia from 121 min to 231 min. Although post-operative pain relief after caesarean section with intrathecal pethidine and bupivacaine mixture has been described previously there was no comparison with placebo[14]. Studies of addition of other opioid to intrathecal bupivacaine showed that fentanyl 15 ug increased the mean duration of effective analgesia.[15] Nausea and vomiting are troublesome side effects encountered during spinal anaesthesia because of hypotension but direct opioid effect can also be a factor. We found increased incidence of intra operative nausea and vomiting in pethidine group after correction of hypotension. Previously intrathecal pethidine 10 mg was found to be associated with more nausea and vomiting when compared with other narcotic analgesics used intrathecally for continuous spinal analgesia.[16] Large doses of intrathecal pethidine alone used in spinal anaesthesia have also been associated with nausea and vomiting[9-11]. This study indicates that intrathecal pethidine in doses as 10 mg can increase the incidence of nausea and vomiting.

Pruritus has been associated with intrathecal narcotic analgesics like morphine and fentanyl[5,7,16,17]. In our study no patient complained of pruritus during and 24 hours after the operation. Incidence of pruritus increases from 10% to 32% when pethidine is used in doses more then 50 mg intrathecally[9-11]. Our patients did not show any neurological deficit after operation. No report in theliterature suggested that intrathecal pethidine is associated with neurological dysfunctions[8]. Respiratory depression is only associated with higher doses of intrathecal pethidine or concurrent use of sedatives[8-18].

CONCLUSION

The addition of 10 mg pethidine to hyperbaric bupivacaine for spinal anaesthesia prolonged analgesia after open prostatectomy and inguinal hernia from 100-135 min (mean 121 min) to 180-287 min (mean 231 min). However, an important limitation of its use is increased intraoperative nausea and vomiting which needs further studies with prophylactic antiemetics.

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