

UNILATERAL SPINAL ANAESTHESIA; ADDITION OF PETHIDINE TO BUPIVACAINE FOR PAIN RELIEF IN HIP SURGERY

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ABSTRACT... Objectives: To see the effects of adding pethidine to intrathecal bupivacaine on duration of post operative analgesia in patients undergoing hip surgery. **Design:** A randomized placebo controlled observational study. **Setting** C M H Multan: **Period:** From March 2006 to April 2007. **Patient and Methods:** A total of 90 male patients of age 60-75 years of comparable weight and height and ASA status II, III were selected. Patients were divided into two groups, group A and group B. Each group consisted of 45 patients. All patients were assessed pre operatively a day before surgery and were briefed about the procedure. **Results:** All the patients were prepared before giving spinal anaesthesia. Patients in Group- A were given a mixture 01 ml of 0.75 bupivacaine and 0.2 ml of normal saline in lateral decubitus position with operating side down by using 23 G spinal needle. Patients in Group-B were given a mixture of 01 ml of 0.75 % bupivacaine and 0.2 ml of inj. pethidine 10mg in lateral decubitus position with operating side down by using 23 G spinal needle. All the patients were kept in lateral decubitus position for 10 minutes to achieve unilateral block. Intra operative adverse effects like hypotension, nausea, vomiting, pruritis and delayed respiratory depression and effective duration of post operative analgesia was recorded. **Conclusion** Addition of 10 mg pethidine to intrathecal hyperbaric bupivacaine is associated with prolonged postoperative analgesia and minimal side effects like hypotension, pruritis, and delayed respiratory depression. However incidence of nausea and vomiting was much more.

Key words: Pethidine, Intrathecal, Hyperbaric, Bupivacaine, Analgesia, hip surgery, unilateral

INTRODUCTION

This study was carried out at Combined Military Hospital Multan cantonment from March 2006 to April 2007. Patients scheduled for hip surgery (dynamic hip screw and Austinmoore) were given different dosage of 0.75% bupivacaine and results were recorded. Subsequently the dose of hyperbaric bupivacaine was reduced inj. pethidine 10 mg was added to bupivacaine. Requirements for supplemental pain relief intra operatively as well as post operatively were reduced. Based on this observation, this study was conducted.

In recent years spinal anaesthesia is becoming increasingly popular in developing countries because of reliability, rapid onset and being cost effective. Although a local anaesthesia solution may be used alone for spinal anaesthesia, opioids are commonly added. When the

lipophilic opioids fentanyl and sufentanil were added to local anaesthetic solution, early post operative analgesia was prolonged compared with local anaesthetic solution alone¹⁻³.

In these studies, the reported time to first post operative analgesia ranged from 4–13 hours⁴. For morphine, which is more lipophilic, post operative analgesia may extend upto 24 hours⁵⁻⁷.

Pethidine is an opioid of intermediate lipid solubility and

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is unique in having significant local anesthesia properties. It has been used as sole agent for caesarean section⁸. Tanscickuk and his colleagues⁹ described a particular technique of spinal anaesthesia in patient receiving one limb orthopaedic surgery, which they named spinal hemi analgesia.

PATIENTS AND METHODS

A total number of 90 patients age between 60-75 years ASA class II, III scheduled for hip surgery (Dynamic hip screw and Austun Moore) under spinal anesthesia were included in this study. These patients were divided in two equal groups. Each group consisted of 45 patients.

INCLUSION CRITERIA

- ▶ American society of Anaesthesiologist's physical status class II & III.¹⁰
- ▶ New York heart association grading for dyspnoea grade I & II.¹¹
- ▶ Patient without any significant systemic disease.

EXCLUSION

- ▶ American society of Anaesthesiologist's physical status class IV and above.¹⁰
- ▶ New York heart association grading for dyspnoea III and above.¹¹
- ▶ Patients with diseases/ Injuries of vertebral column.
- ▶ Patients with Coagulopathy
- ▶ Patients with Neurological deficits.

Patients were operated for dynamic hip screw (DHS) and Austun Moore. Blood loss in all patients was comparable. Average duration of surgery was 40 minutes (min). Pre-anaesthetic evaluation and counselling was done a day prior to surgical procedure. Diazepam 5 mg orally HS and 300mg Ranitidine in the morning on the day of operation was prescribed. Patients were kept NPO from midnight onward.

A written consent of the procedure was obtained from all the patients of either group. An 18G peripheral intravenous (I/V) canula was inserted and 400 ml of

Ringer Solution was administered as pre-load to all the patients of Group A and Group B.

Solution for spinal anaesthesia were prepared under strict sterile conditions by anaesthetist. 01 ml of 0.75% Bupivacaine mixed with 0.2 ml of Normal Saline solution for group A. 01 ml of 0.75% Bupivacaine mixed with 0.2 ml Inj. Pethidine 10 mg for group B. The dose of pethidine 10 mg was chosen because this dose has previously been used intrathecally^{14,15}.

The skin was prepared with Pyodine solution, a local Anaesthetic, 1% Lignocaine plain was infiltrated at the site of Lumber puncture (LP). LP was performed in midline with 23G pencil point spinal needle at L4-5 intervertebral space while patients were placed in lateral decubitus position with operative side down. After confirming free flow of cerebrospinal fluid (CSF), solution prepared for spinal anaesthesia was administered over 10 seconds according to the group. All the patients were kept in lateral decubitus position for 10 minutes to achieve unilateral spinal block.

Continuous monitoring was performed including Electrocardiography (ECG), pulse oximetry and non-invasive blood pressure (NIBP) monitoring at 3 min. interval throughout the procedure. Nausea and vomiting was treated with metoclopramide 10 mg I/V after excluding hypotension.

Postoperative monitoring was extended to 24 hours and included ECG, pulse oximetry, NIBP. Time for first analgesia requirement was recorded in each patient. Side effects like nausea, vomiting, hypotension, pruritis and delayed respiratory depression were documented.

RESULTS

90 patients in total were included in this study and 45 patients were placed in each group. In-group "A" time to first analgesia requirement ranged between 100-135 min with mean 121.35 min (SD 9.25) and in group B the time for first analgesia dose was 190-287 min with mean 230.75 min (SD 35.64), and these means are statistically significant as p-value is 0.000 (Table-I). Four (9%)

patients complained of nausea and vomiting in group A as compared to 09 (20%) patients in group B (p-value 0.129). Table-II.

Table-I. Minimum (min) and maximum (max) duration of effective analgesia in min with mean and SD				
	Min. Time for first analgesia in min	Max. Time for first analgesia in min.	Mean and SD in min.	P-Value
Group A	100	135	121.35 (9.25)	0.000
Group B	180	287	230.75 (35.64)	

There was minimal effect on Blood Pressure in both the groups and results were similar. Similarly no patient in both groups showed delayed respiratory depression and pruritis. Table-I: Minimum (min) and maximum (max) duration of effective analgesia in min with mean and SD.

Table-II. Incident of adverse intra operative events			
Adverse events	Group A (n=45)	Group B (n=45)	P-Value
Hypotension	No significant effects	No significant effects	0.129
Nausea, Vomiting	4 (9%)	9 (20%)	
Delayed respiratory depression	Nil	Nil	
Pruritus	Nil	Nil	

DISCUSSION

Haemodynamic side effects of spinal anaesthesia are well known and similarly pain relief is major challenging problem in immediate postoperative period. An effort was made to provide postoperative pain relief to the patients undergoing hip surgery by adding inj. pethidine 10mg to local anaesthetic solution. (hyperbaric bupivacaine).

It was observed that addition of pethidine to intrathecal hyperbaric bupivacaine significantly increased the mean duration of effective postoperative analgesia from 121 minutes to 231 on the average. Although postoperative pain relief after caesarean section with intrathecal pethidine and bupivacaine mixture has been described previously, but there was no comparison with placebo¹⁶.

Studies of addition of other opioids to intrathecal bupivacaine showed that fentanyl 15ug increased the mean duration of effective analgesia¹⁷. Nausea and vomiting are troublesome side effects encountered during spinal anaesthesia because of hypotension but a direct opioids effects can also be a problem.

There was increased incidence of intra operative nausea, vomiting in pethidine group. Intrathecal pethidine 10 mg is otherwise associated with higher incidence of nausea, vomiting when compared with other narcotic analgesics used intrathecally for continuous spinal analgesia. Large doses of intrathecal pethidine alone used for spinal anaesthesia have been associated with increase incidence of nausea and vomiting. This study indicates that intrathecal pethidine in doses as 10mg can increase the incidence of nausea and vomiting.

Pruritis has been associated with intrathecal narcotic analgesic like morphine and fentanyl^{18,19}. In this study no patients of either group complained of pruritis and similarly no case of delayed respiratory depression was observed. Respiratory depression is only associated with higher doses of intrathecal pethidine or concurrent use of sedative.

Hypotension is a common complication of spinal anaesthesia occurring upto 33% of patients when larger doses of local anaesthetics have been used²⁰. Unilateral spinal anaesthesia with smaller dose of hyperbaric bupivacaine solution is very effective in restricting the sympathetic block when used in lateral position with operating side down in old age patients coming for lower limb surgery²¹.

In one study when haemodynamic changes were compared between bilateral and unilateral spinal blockage with the same dose of hyperbaric bupivacaine the incidence of hypotension was 22.4% and 5% respectively²².

In this study no significant changes in blood pressure were observed in both the groups and the results were comparable in both groups.

CONCLUSIONS

Addition of inj. pethidine 10 mg to hyperbaric bupivacaine for spinal anaesthesia prolonged postoperative analgesia after hip surgery from 100-135 min (mean 121 min.) to 180-287 min (mean 231 min). Unilateral spinal anaesthesia with lower doses of hyperbaric bupivacaine mixed with inj. pethidine 10mg was associated with min side effects like hypotension, pruritis and delayed respiratory depression. However higher incidence of nausea and vomiting may be limiting factor for the use of pethidine intrathecally.

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REFERENCE

- Hunt CO, Nautry JS, Bader AM, etal. **Perioperative analgesia with subarachnoid fentanyl-bupivacaine for cesarean delivery.** Anaesthesiology 1989: 71:535-40.
- Belzarena SD, **Clinical effects of intrathecally administered fentanyl in patients undergoing cesarean section.** Anesth Analg 1992: 74: 653-7.
- Dahlgren G, Hustrand C, Jakobsson J, Norman M, Eriksson EW, Martin H interthecak suffentanil, **fentanyl, or placebo added to bupivacaine for caesarean section.** Anesth Analg 1997:85:1288-93.
- Dahlgren G, Hustrand C, Jakobsson J, Norman M, Eriksson EW, Martin H **Intraoperative and postoperative analgesic efficacy and adverse effects of intrathecal opioids in patients undergoing cesarean section with spinal anaesthesia.** Anaesthesiology 1999:91:1919-27.
- Abouleish E, Rawal N Fallon K, Hernandez D. **Combined intrathecal morphine and bupivacaine for cesarean section.** Anesth Analg 1988:67:370-4.
- Swart M, Sewell J, Thomas D, **Intrathecal morphine for cesarean section: an assessment of pain relief satisfaction and side effects.** Anaesthesia 1997:52:373-7.
- Palmer CM, Emerson S, Volgoropolous D, Alves D **dose-response relationship of intrathecal morphine for post cesarean analgesia,** Anaes 1990:90:437-44.
- Ngan kee WD intratheca pethidine **Pharmacology and clinically applications.** Anaesth Intensive Care 1998:26:137-46.
- Tansichuk MA, Schultz EA, Mathews JH, Van Bergen FH. **Spinal hemianalgesia: an evaluation of a method, its applicability, and influence on the incidence of hypotension.** Anaes 1961:22:74-85.
- Aitkenhead A.R, Smith G, Textbook of Anaes 1994:333-347.
- Kumar P, Clark M, Clinical Medicine; 1994:3:521-528.
- Chung JH Sinatra RS, Sevarino FB Fermo L, **Subarachnoid meperidine-morphine combination, An effective pre operative analgesic adjust for cesarean delivery** Reg Anaesth 1997:22:119:24.
- Shende D, Cooper GM Bowden MI **The Influence of intrathecal fentanyl on the characteristics of subarachnoid block for cesarean section** Anaesth 1998:53:706-10.
- Norris MC. Boreen S, Leighton BL Minge D. Kent H **intrathecal meperidine for labor anaesthesia.** Anaesth 1990:73:A983.
- Swayze CR Skerman JH Walker EB Shotle FG **Efficacy of subarachnoid meperidine for labor analgesia** Reg Anaesth 1991:16:309-13.
- Naugyen Thi TV Orliaguest G, Ngu TH Bonnet F **Spinal anaesthesia with meperidine as the sole agent for cesarean delivery.** Reg Anaes 1994:19:386-9.
- S.C. Yu, W.D. Ngan kee and A.S.K Kwan **addition of meperidine to bupivacaine for spinal anaesthesia for cesarean section.** British Journal of Anaesth 2002:88:379:83.
- Lin BC Lin PC Lai YY Huang SJ Yeh FC. **The maternal and fetal effects of the addition of sufentanil to 0.5% spinal bupivacaine for cesarean delivery a Prospective study of 856 cases.** Reg Anaesth 1991:16:137-40.

19. Ong B, Segstro R, **Respiratory depression associated with meperidine spinal anaesthesia**, Can. Anaesth 1994;41:72.
20. Carpenter RI, Caplan RA, Brown DL, et al. **Incidence and risk factors for side effects of spinal anaesthesia in high-risk patients**. Anaes 1992;76:906-916.
21. Chohan, U; Hoda, M.Q; Afshan, G (AKU Karachi). **Haemodynamic effects of unilateral spinal anaesthesia in high risk patients**. Reg Anaes and Pain Medicine Supple 2001;26(2):55.
22. Casati A, Faneli G, Alegheri G, et al. **Frequency of hypotension during conventional of asymmetric hyperbaric spinal block**. Reg Anaes 1999;24:214-219.

PREVIOUS RELATED STUDIES

- Muhammad Aslam, Maj Arslan Sharif Malik. Lower abdominal & pelvic surgery; Addition of pethidine to bupivacaine for spinal anaesthesia. Professional Med J Mar 2004;11(1):79-82.

CORRECTION

The amendment of the Professional Vol:16, No.04 (Prof-1408) titled: "Agricultural machines injuries" page no. 485-488 is as under;

INCORRECT

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