Effect of Intrathecal Morphine in Post Operative Analgesia

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ABSTRACT:

INTRODUCTION: Analgesic technique used for effective pain control with minimum side effects will decrease complications and facilitate early recovery during immediate postoperative period. Use of intrathecal morhine as adjunt has been recommended for good postoperative analgesia. The objective of this study is to assess duration of post operative analgesia with different doses of intrathecal morphine and side effects in postoperative period after vaginal hysterectomy done under subarachnoid block.

METHOD: This is an observational study done in 77 patients undergoing vaginal hysterectomy under spinal anesthesia in surgical camp organized by District Hospital, Ilam. A subarachnoid block was given using intrathecal 0.5% heavy bupivacaine with and without morphine using different dose OF 0.1 milligram, 0.2 milligram and 0.3 milligram(mg) intrathecally as an adjunt. Duration of analgesia and side effect profile of morphine was analysed postoperatively.

RESULT: Duration of postoperative analgesia using only bupivaicaine was 5.313 ± 0.352 hour. With 0.1mg, 0.2 mg and 0.3 mg of intrathecal morphine with bupivaicaine, the duration of postoperative analgesia was 23.46 ± 1.29 hours , 62.17±1.43 AND 66.8± 2.86 hours respectively. All Patients with 0.3 mg of intrathecal morphitne developed itching. SIX patients (12.5%) with 0.2 mg of morphine developed itching. No itching was noted in 0.1 mg group.

CONCLUSION: Intrathecal 0.5% heavy bupivacaine mixed with 0.2 mg of morphine as adjunt provides 62.17±1.43 hours of postoperative analgesia with minimum side effects.

KEY WORDS: Intrathecal; Postoperative Analgesia; Spinal Anaesthesia; Vaginal Hysterectomy;

INTRODUCTION

Post-operative pain is a complex physiological reaction to tissue injury or disease. Various combinations of intrathecal drugs have been tried to provide effective post-operative analgesia like clonidine ketamine dexmeditomedine, neostigmine, midazolam. The intrathecal administration of local anaesthetics and opioids is an excellent technique for managing postoperative pain.[1-3] Morphine is one of the commonly used drug recommended for the treatment of postoperative pain.[1] They exert their effect by mimicking the action of endogenous opioid receptors that are found in location throughout the central nervous system, including the periaquaductal and periventricular gray matter and the dorsal horn of the spinal cord.[1,2] The patients often have better pulmonary function, are able to ambulate early and benefit from physical therapy. Moreover, the patients are at lower risk for postoperative thrombosis[1,3]. Intrathecal morphine, naturally occurring of opium alkaloid 0.2-0.4mg alone can provide excellent analgesia but many patients experienced dose dependent side effects.[3,4]

Intrathecal morphine is more hydrophilic than other opioids, has a longer residence time in the Cerebrospinal Fluid and therefore may reach rostral sites over a longer period than other opioids. The basis of this is related to the location of opioids receptors in the substantia gelatinosa of the spinal cord. Opioid receptor activation inhibits the presynaptic release and postsynaptic response to excitatory neurotransmitters from nociceptive neurons Transmission of pain impulses are interrupted at the spinal cord level[4].

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The side effects associated with intrathecal morphine are pruritus, sedation, nausea, vomiting and delayed respiratory depression which warrants close monitoring of the patients for the first 24 hours.[4,] Postoperative pain is one of the problems of surgical treatment for lower abdominal particularly vaginal hysterectomy. The utilization of opioids is widely accepted and effective for postoperative pain control.[5,6]

Intrathecal morphine is an established usage in the management of postoperative pain[7.8] Side effects are rare if morphine is used at a low dose.[9.10] The purpose of this study was to analyse the duration of postoperatice analgesia after using intrathecal morphine with hyperbaric bupivacaine in vaginal hysterectomy undergoing subarachnoid block. Side effect profile with different doses was also analysed.

METHOD

A observational study was performed in seventy seven patients undergoing vaginal hysterectomy under spinal anesthesia in 7 days of surgical camp organized in June 2009 by District Hospital, Ilam. subarchanoid block was given and in the effect of different dose of morphine mixed with 0.5% bupivacaine in spinal anaesthesia was studied.

Preanesthetic check up was done a day before surgery of those patients which is previously attended by doctors of district hospital. American Society of Anesthesiologist Physical Status Grade I and II. patient was prepared using intravenous cannulation using 18/16 gauge cannula. Consent was taken from the patient party and the hospital administration. intraoperatively, heart rate, noninvasive blood pressure, electrocardiogram, oxygen saturation was monitored. Preloading was done with 500 ml of Ringer Lactate. Then patients were kept in sitting position. After all aseptic precaution routine spinal technique using intrathecal 0.5% heavy bupivacaine 3.5 mL (17.5 mg) was administered with a 26-gauge Quincke spinal needle at either L3-4 or L4-5 space. Patient sample was taken purposefully. On first day of camp 8 patients underwent surgery under spinal anesthesia with 3.5ML 0.5% heavy bupivacaine. On second day onward, morphine was prepared for intrathecal route. 1ml ampoule morphine contained 15 mg of morphine. 1ml of morphine (15mg) was mixed with 9ml of sterile water in a 10 ml syringe(1ml=1.5mg). 1ml from this 10ml syringe was taken out in 3ml syringe again and 0.5 ml of sterile water was mixed (1.5 ml equals to 1.5 mg of morphine). This 3 ml syringe has 10 small segments for 1 ml so 1.5 ml has 15 segments which meanS it was prepared 0.1 mg/0.1 ml. New morphine preparation was made every day. On second day 3.2 ml bupivacaine and 0.3ml (300 microgram) morphine was mixed and given to 10 patients intrathecally. Considering the side effect, on third day 11 patients were given 3.4 ml bupivacaine and 0.1 ml (100 microgram) morphine. Till, fourth day onward considering the duration of analgesia and side effects 3.3 ml bupivacaine and 0.2 ml (200 microgram) was given to 48 patients. Then the patients were put supine immediately. All patient were assesed for level of sensory blockade. Any significant fall in systolic blood pressure was treated will bolus crystalloid or Mephentermine IV as required. Patients were transferred to the postoperative area after the operation. This area was equipped with the emergency drugs and round the clock nursing staffs for observation of the patients. Postoperative pain was assessed at any time of pain complain. (Pethidine/ Phenargan and/ or dictofenac) was used as rescue analgesia. The duration analgesia was taken as time of first demand of analgesics either oral or intravenous. pruritus, respiratory depression regarding intrathecal morphine was also recorded postoperatively.

PLAN FOR RESCUE THERAPIES

1. For rescue analgesia 50mg pethidine IM+/ diclofenac75mg IM
2. For itching Phenirammemaleate (Avil) 25mg IM, naloxone not available
3. For nausea and vomiting metoclopramide 10mg SOS

RESULT

Table:1 Demography	
Age	55-78 yrs (mean 62.5 yrs ±3.35)
Sex	Female
ASA 1/ASA2	34/43
Weight in kg	47-63 kg (mean 50 ±2.5)
Duration of surgery	45- 100 min (mean 60±7.56 minutes)

Out of 77 patients included in present study, all were females.

The age group ranges from 55-78 years with mean of 62.5 yrs ±3.35.

The patient weighets bween 47 to 63 kgs with mean of 50±2.5 kgs.

The mean duration of surgery was 60±7.56 minutes. (Table 1)

Table 2. Duration of postopetative analgesia and side effect profile of different doses of morphine used intrathecally

Morhine dose used intrathecally	No. of patients	Duration of postoperative analgesia (Mean±SD)	Side effects
3.5 ml of heavy bupivacaine	8	5.313 ± 0.352 hours	None
3.4 ml of bupivacaine + 0.1 mg (0.1 ml) morphine	11	23.46 ±1.29 hours	None
3.3 ml of bupivacaine + 0.2mg (0.2 ml) morphine	48	62.17 ±1.43 hours	6(12.5%) patients developed facial itching
3.2 ml of bupivacaine + 0.3mg (0.3 ml) morphine	10	66.8± 2.86 hours	Severe generalized itching to all patients.

Those group with 0.1 mg morphine required analgesic after 23.46 ±1.29 hours. Duration of analgesia was 62.17 ±1.43 hours in 0.2mg of morphine group. Total 6 (12.5%) patients complain of facial itching in 0.2 mg morphine group. Those who were given 0.3mg intrathecal morphine had duration of analgesia for 66.8± 2.86 hours . In this group all patients developed severe itching (Table -2). No patient developed respiratory depression, nausea and vomiting.

DISCUSSION

Pain is typically associated with neuro- endocrine stress response that is proportional to pain intensity. Moderate to severe pain, regardless of site, can affect nearly every organ function and may adversely influence postoperative morbidity and mortality. The effective postoperative pain management is a very important aspect of postoperative care. The study demonstrates that an intrathecal morphine injection adds a further analgesic effect postoperatively.[1] SN Singh et al[1] did the comparative study of bupivacaine alone, and mixed with 0.2 mg morphine and butorphenol 0.2mg in vaginal hysterectomy showed VAS was 4 after 8hrs± 2hrs after intrathecal morphine which was the time first analgesic requirement but in this study 62.17±1.43 hours was the time. Trivedi et al[4] evaluated the efficacy of intrathecal morphine along with bupivacaine for post-operative analgesia in patients undergoing vaginal hysterectomy concluded that intrathecal administration of 0.1mg preservative free morphine along with 0.5% bupivacaine (17.5mg) significantly prolongs the duration of post-operative analgesia up to 14 hours. But this study showed analgesic requirement to whom 0.1mg morphine was used was only after 23.46±1.29hours. In both the studies, it may be due to the fact that vas was not assessed in this study and threshold for analgesic requirement in our population may vary. Palashevska, l,et al[11] in similar study showed that the mean duration of analgesia in 0.1 mg morphine group was 19.7 ± 1.7 hours ($p< 0.05$) which seems to be similar to this study.

Through a large range of doses, there is a lack of evidence of linear dose-responsiveness, for any of the beneficial or harmful effects. Late last century very large doses up to 4 mg were used while today the doses range from 0.1-0.5 mg, depending on the type of surgery.[11] In a meta-analysis based on studies on spinal anesthesia, with morphine as an adjuvant of an local anesthetics without general anesthesia, the rate of adverse effects of intrathecal morphine was analysed. And it was shown that the use of intrathecal morphine at doses < 0.3 mg, the rate of episodes of respiratory depression was not higher compared to the placebo group who received systemic opioids.[12] Gehling MH, et al[13] studied the application of patient-controlled analgesia devices could be avoided if intrathecal morphine is given in combination with spinal anaesthesia results showed that the patients with 0.1 or 0.2 mg morphine showed a significant reduction in opioid requests compared with placebo during 72 h after surgery (P = 0.0001). Forty per cent of patients with intrathecal morphine did not ask for systemic opioids and concluded that intrathecal morphine in a dose of 0.1 and 0.2 mg provides effective analgesia for up to 48 h without any need for systemic opioids at all in many patients which nearly match with the result

of this study. Intrathecal morphine was not associated with an increased frequency of respiratory depression. The utilization of opioids is widespread and effective or controlling postoperative pain. Since the discovery of morphine receptors in the brain by Pert et al[14]. in 1973 and the subsequent first report of clinical intrathecal administration of morphine chloride by Wang et al[15] in 1979, such administrations have become one of the most common analgesia methods used worldwide. Intrathecal use of morphine as adjunt is very helpful in the camp set ups where the pain relief is not often of prime concern. This helps avoiding repeated systemic administration of analgesics and decrease its requirements. Repeated systemic administration can increase the risk of infection at the side of delivery and increase the overall cost to the patient .[16]

Studies suggest more side effects in the morphine group when used in high dose above 300 microgram causing excessive itching[1], a finding similar to this study. Side effect like nausea and vomiting were not observed, this may be due to use of ondensetron from the time of completion of surgery and postoperative ward on regular basis for 48 hours. Urinary retention could not be assessed as all patients were catheterized before starting of surgery.

CONCLUSION

It was concluded in this study that 0.2 mg of intrathecal morphine provided prolong analgesia for more than about 60 hours in Vaginal hysterectomy with minimal side effects.

LIMITATIONS

1. Study was done in short duration with less human resources.
2. Pain scoring was not done and
3. Requirement of first analgesic was taken as duration of analgesia.

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