Original Article

Use of intrathecal morphine for analgesia in a surgical camp set up in Nepal

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Background: Pain management is often inadequately addressed, especially in a mobile surgical camp set up. We try to look at an easier and effective method, i.e. intrathecal morphine for pain relief and it's practicability in a camp set up.
Method: 89 patients under going vaginal hysterectomy under spinal anesthesia were studied. They were randomly allocated to those receiving bupivacaine and intrathecal morphine (n=61) and another group receiving bupivacaine only (n=28). Their need for post operative analgesia and untoward effects like nausea/ vomiting, pruritis and respiratory depression were compared.
Results: Significant pain relief was seen with the added intrathecal morphine but it also caused increased incidence of vomiting. Other serious effects were not seen.
Conclusion: Intrathecal morphine is an effective method of post operative analgesia in operations under sub arachnoid block but an effective antiemetic cover is also required and vigilance to tackle any untoward effects is needed.

Introduction

This is a study conducted in mobile surgical camp at a district hospital set up. The surgeries were all vaginal hysterectomies, performed under subaracnold block (SAB). The study was conducted with the aim of providing a reliable method of post operative analgesia in a camp setup. The routine method of pethidine and phenargan for analgesia is often administered inadequately in these setups and the patients have inadequate pain relief

For these reasons, the intrathecal administration of morphine along with bupivacaine at the time of the Sub arachnoid block, is a good choice for postoperative analgesia. It avoids the frequent administration of the analgesic drugs in the post op period.

Intrathecal morphine is widely used for analgesia following operations under spinal anesthesia. Because of the low lipid solubility of morphine, it is retained in the cerebro spinal fluid, prolonging the duration of action as well as promoting its cephalad spread. It not only acts on the opioid receptors in the substantia gelatinosa of the dorsal horn of the spinal cord but also exerts a supraspinal effect to provide analgesia[2]. When given intrathecally, it has been shown to provide analgesia for upto 24hour.[1]

Morphine has the advantage of selectivity of analgesia in the absence of motor and sympathetic blockade, which facilitates ambulation while minimizing the risk of hypotension. Intrathecal morphine requires 45 to 60min to achieve peak effect. Intrathencal bupivacaine provides analgesia till that period.[3]

Morphine has got annoying and occasionally serious side effects and complications including pruritus, nausea and vomiting, urinary retention, somnolence and respiratory depression.[4]

The nausea and vomiting may result either from rostral spread of the drug in CSF to the chemoreceptor trigger zone or the vascular uptake and delivery to the vomiting center and CTZ.[4]

Intrathecal morphine causes urinary retention by inhibiting sacral parasympathetic outflow, which results in relaxation of the bladder detrusor muscle and inability to relax the sphincters. It is not a troublesome problem in CS and gynecological procedures as urinary catheters are left in situ for at least 24hrs.

The most serious side effect of intrathecal morphine is respiratory depression. The incidence of ventilatory depression requiring intervention after conventional dose of neuraxial opoids is about 1%, which is the same as that

after the conventional doses of IV or IM opioids.[4]
Although intrathecal morphine has been used worldwide in different doses and different combinations all over the world safely, we haven't been able to use it in our setup because of lack of experience with it.

Materials and methods

All the patients coming for operation in the camp were recorded in the study. The randomization was done in empirical basis: the patients coming in the first 4 days of the camp were given intrathecal morphine along with bupivacaine during the sub arachnoid blockade and the rest were given bupivacame alone as per the regular practice. A total of 89 patients were recorded and followed. Among them, 6 1 were given intrathecal morphine and the rest were given plain bupivacaine only.
All the patients were screened in the out patient clinic for fitness for anesthesia. Some also had blood workups and ECGs done, as felt necessary. After bringing the patients to the operating theatre, intravenous access was opened with 18G cannula and 500ml 1000ml of ringer lactate was preloaded. They were attached to the monitors, which included ECG, blood pressure monitor and pulse oximeter. SAB was performed with patient in sitting position with 25G Quinke needle.
Drug used 3.2 to 3.5ml of 0. 5% bupivacaine in the control group, and the same drug with 150microgram morphine (morphine diluted in normal saline to 150 microgram/ml) in the study group.
Then the patients were put supine immediately. All the patients were assessed for the level of sensory blockade and most of the patients had a block upto T7, T6. The monitor readings were periodically recorded. Surgery was commenced after satisfactory effect of the SAB. Any significant fall in systolic blood pressure was treated will bolus crystalloid or Mephentermine IV as required. Other interventions like antiemetics and sedation was given as per discretion of the anesthesiologist during the operative period.
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 2 to 4 hourly and at any time of pain complain. It was graded subjectively and rescue analgesics were given as required. (Pethidine/ Phenargan and/ or dictofenac)
Sedation Scores were recorded 2 to 4 hourly for 24 hours.

Awake	1
Dozing intermittently	2
Mostly sleeping	3
Only awakens when aroused	4

Time for first administration of supplemental analgesic from the time of administration of intrathecal morphine and total analgesic requirement was noted. Any postoperative complications (e.g. surgical bleeding or anaesthetic post dural puncture headache) was noted and managed accordingly. .
Statistical analysis was done with the help of SPSS computer program with chi square and Wests wherever appropriate. Help was also taken with the statistician for the same.

Plan for rescue therapies

1. For rescue analgesia 50mg pethidine IM +/ diclofenac 75 mg IM
2. For mild itching Chlorpheniramme maleate (Avil) 25mg IM and for severe itching Naloxone (0. 1 0.2mg IV or by titration).
3. For nausea and vomiting, 25mg promethazine (Phenargan) IM +/ metoclopramide 10mg
4. Respiratory depression (sedation score of 3 or 4 and respiratory rate below 8 per minute) Naloxone 0.1 0.2mg IV or by titration.

Results

The patients ranged from 35yrs to 80yrs.
The randomization was done according to the serial order of the patients presenting for surgery. Those presenting in the first four days were given intrathecal morphine but the rest were not *(Fig. 1).*

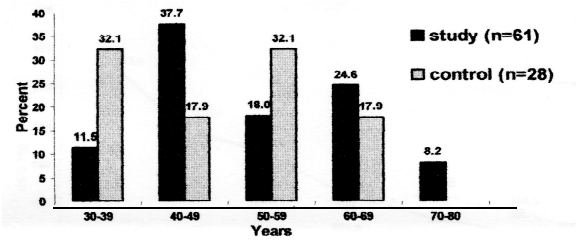

Fig. 1 Age distribution

There was no significant change in the hemodynamics of the two groups, regarding the FIR and BP. It was as expected because the dose of bupivacaine given were not different between the groups *(Fig. 2)*.

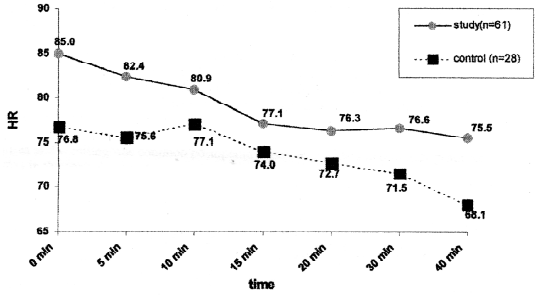

Fig. 2 Change in mean heart rate intraoperatively

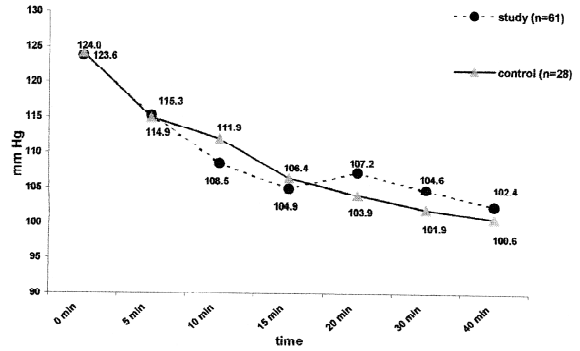

Fig. 3 Change in mean systolic BP intraoperatively

Comparing the HR and systolic BP in each time interval between the groups, there was no significant difference *(Fig. 3)*.

The use of mephentermine to maintain BP was not significantly different between the groups. 26.2% in the study group and 7. 1% in the control group needed mephentermine (P value of 0.072) with the mean dose of 8.3mg and 9mg respectively. So, the I ml of morphine in normal saline (150microgram) didn't significantly alter the autonomic blockade as compared to the control group.

Nausea and vomiting was common postoperative problem. 63.9% in the study group and 78.6% in the control group had vomiting.

Among the patients with vomiting, we tried to categorize the episodes as two or less and multiple episodes.

Table 1 Vomiting episodes among the groups

Vomiting episodes	Study No	Percentage	control No.	total Percentage	P value
≤2	26	66.7	22	100.0	48(78.7%)
>2	13	33.3	0	-	13(21.3%
0.002					
Total	39		22		61 **Significant**

Among those with vomiting, there were significant no. of patients with multiple episodes of vomiting in the morphine group compared with the control.

Looking at the need of analgesic, 78.6% in the control group needed pain rescue within 24hours compared.to only 24.6% in the morphine group; P value of .000002.

For those in need of rescue analgesics, the mean duration for the need of first rescue analgesic after the initiation of the SAB was 10.71irs in the morphine group and 4.61irs in the control group. Time (in hours) of pain rescue *(Table 2)*.

Table 2 Need of rescue analgesics

						95% Confidence Interval of mean time (hrs)		
	n	Mini.	Maxi.	Mean	SD	Lower limit	Upper limit	p value
Study	61	3	22	10.7	7.0	6.9	14.6	
	28	2	10	4.6	1.7	3.9	5.4	0.005 (Significant)

Intra thecal morphine

Time for rescue analgesia in the control and the study group shown within 95% Confidence Interval *(Fig. 4)*.

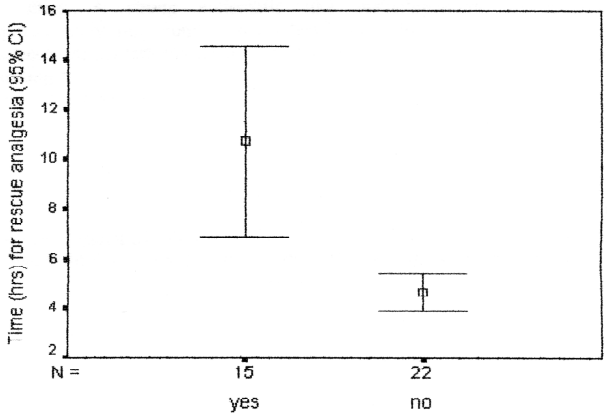

Fig. 4 Time for rescue analgesia

Discussion

This was only a small scale study in the rural camp set up in Nepal. It was an effort to try to see the effects of intrathecal morphine for better pain management of patients postoperatively.

Initial studies used more than 1mg of morphine from the intrathecal route and had many side effects. Later, many clinicians looked at lower doses of intrathecal morphine. Abboud et al' reported that 0.25 and 0. 1 mg doses of intrathecal morphine reduced VAS pain sores after cesarean section by 50% or more for a mean of 27.7 and 18.6 hours respectively. Abouleish et a19 found a mean of 27hours to first request for additional analgesia after a 0.2mg dose of intrathecal morphine.

Our study also utilizes the mini dose of intrathecal morphine. The study does show a better pain control in the study subjects. Only 24.6% of the study patients asked for additional pain relief within 24hours; with the mean duration of 10.7hours for the first pain rescue. It is very helpful in the camp set ups where the pain relief is not often of prime concern. This avoids repeated Lm. injections of Pethidine and Phenargan.

The repeated i.m. injections is not a good method of pain relief as the level of analgesia peaks and drops. It can be a potential source of infection. it is costlier method compared to the intrathecal morphine when the cost of the drugs and syringes are added up.

Regarding the untoward effects of intrathecal morphine; the patients were on urinary catheters for >24hours, so there was no question of urinary retention.

We did not come across any respiratory depression and only a single case of pruritis was seen, which was managed accordingly.

But there was significant more problem of vomiting in the study group and needed antiemetics. A strong antiemetic like metoclopramide or ondansetron given prophylactically may control this effect. Some have also shown good results with intrathecal midazolam and dextromethorphan in controlling morphine induced nausea and vomitting.[6-7]

Among the other concern, the hemodynamic effects of the intrathecal morphine was not significant in terms of the change in HR, BP and the use of mephentermine. This shows that the intrathecal route of morphine administration does not cause autonomic effects.

The limitation of the study is the small size and lack of blinding. The randomization is not even between the groups in terms of the number of patients.

Acknowledgements

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