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Original Research Article

A comparative study on post-operative pain relief by intrathecal buprenorphine hydrocholoride with control group

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ABSTRACT

Background: Surgical trauma is a real and severe tissue damage resulting in surgical pain which is a universal phenomenon. Post-surgical pain experienced by patient is often significantly greater than anticipated by the patient. Recognition that inadequate analgesics adversely affect the patient's cardiovascular, pulmonary and emotional status has spurred development of new and highly effective methods of controlling pain. The benefits of postoperative analgesia are speedy recovery, reduction in physical and mental stress, improvement in pulmonary function (by allowing the patient to cough, breath and move more easily), less stress on cardiac function, decreased incidence of thromboembolic complications. Buprenorphine is a highly lipid soluble narcotic of antagonist agonist type which is 40-50 times more potent than morphine. As per available previous researches, low dose of intrathecal buprenorphine produces prolonged postoperative analgesia with lesser side effects.

Methods: The present study was carried out in the department of anaesthesiology, CCM medical college, Durg, Chhattisgarh, India during study period August 2015 to July 2016. The study comprised of 80 patients undergoing surgery of lower abdomen below umbilicus (T10) and lower limbs. Patients of age Group between 20-60 years of age of either sex of ASA group I and II were included in the study. Pre-anesthetic evaluation was done prior to surgery. The patients were randomly divided into 2 groups [group-I (control), group II (Buprenorphine hydrochloride 0.06 mg intrathecally)] of 40 patients each. All the patients were informed about visual analogue scale preoperatively. After the surgical process, observations were recorded. The assessment of results of both groups were done. The results were analysed by unpaired' test and p value.

Results: Mean age in both the groups were comparable and statistically insignificant ($p>0.05$). Mean age in group I was 39.3±1.5 years and group II was 38.5±12.2. In group II, there was male predominance i.e. M: F was 3: 2, whereas in group I sex ratio was equal (M: F was1:1). Mean weight in both groups were comparable and statistically insignificant ($p>0.05$). In group I mean weight was 49.5±2.5 kg and 45% pts. Were between 40-50 kg weights. In Group II mean weight was 50.9±8.2 kg and 40% patients were between 40-50 kg weights. Patients receiving study drug has significantly rapid onset of sensory block as compared to control Group ($p<0.05$). Patients of group II had significantly rapid onset of motor block ($p<0.05$). The mean duration of surgery in group I was 90.8±44.0, and group II 115.0±40.0 min. The mean duration of motor block in Group I was 190.5±57.2 min and group II was 186.5±30.1 min (3.12+ 0.52 hours). Duration of absolute and effective analgesia is significantly higher in Group II. VAS score is significantly lower in group II patients. There was no statistically significant change in systolic blood pressure, diastolic blood pressure and pulse rate attributable to intrathecal buprenorphine.

Conclusions: On the basis of observation and results of our study we conclude that buprenorphine has been found to be superior for postoperative analgesia as compared to control group.

Keywords: Buprenorphine, Post operation, Pain

INTRODUCTION

Pain is perceived to be a multidimensional and subjective experience, its subjectivity influenced by behavioral, psychological, sensory, cognitive and cultural factors.[1]

Surgical trauma is a real and severe tissue damage resulting in surgical pain which is a universal phenomenon. Post-surgical pain experienced by patient is often significantly greater than anticipated by the patient. Recognition that inadequate analgesics adversely affect the patient's cardiovascular, pulmonary and emotional status has spurred development of new and highly effective methods of controlling pain.

The benefits of postoperative analgesia are speedy recovery, reduction in physical and mental stress, improvement in pulmonary function (by allowing the patient to cough, breath and move more easily), less stress on cardiac function, decreased incidence of thromboembolic complications.[2-4]

Demonstration and localization of various receptors that play role in nociception and antinociception in spinal cord, have made possible introduction of concept of intrathecal (subarachnoid) and epidural analgesia. The advantage of intrathecal lies mainly in fact that they are effective relatively in lesser doses and therefore less, likely to be associated with undesirable systemic effects of these drugs. Discovery of opioid receptors in early 70's has changed the concepts of pain relief. Numerous studies have demonstrated the efficacy of intrathecal opioid in producing a selective, profound, long lasting analgesia, without motor or sympatheticblockade while intrathecal morphine has been in use since long. There has been continuous need for other opioids, which may be associated with lesser side effects, while retaining the analgesic efficacy of morphine. It is desirable that narcotics to be given by intrathecal route should be lipophilic to avoid side effects by rostral spread. Buprenorphine is a highly lipid soluble narcotic of antagonist agonist type which is 40-50 times more potent than morphine. Low dose of intrathecal buprenorphine produces prolonged postoperative analgesia with lesser side effects.[5-9]

The present study was undertaken in order to evaluate analgesic effects of intrathecal buprenorphine.

METHODS

The present study was carried out in the department of anaesthesiology, CCM medical college, Durg Chhattisgarh, India during study period August 2015 to July 2016. The study comprised of 80 patients undergoing surgery of lower abdomen below umbilicus (T10) and lower limbs.

Patients of age Group between 20-60 years of age of either sex of ASA group I and II were included in the study.

Exclusion criteria

- Patients refusal
- Patients having haemorrhagic disorders
- Any sepsis at the site of lumbar puncture or any spinal deformity
- Severe hypotensive or hypertensive states
- Patients with raised intracranial tension, chronic headache and chronic backache
- Known hypersensitivity to local anaesthetic drug
- Patients having systemic diseases like neurological, cardiac, respiratory, renal, hepatic or endocrinal.

Pre anesthetic evaluation was done prior to surgery. Thorough physical and systemic examination was performed to rule out any disorder the cardiovascular, respiratory, renal, hepatic endocrinal and neurological systems.

The routine investigation done like Hb, TLC, DLC, blood sugar, blood urea, urine biochemical and microscopic examination, serum creatinine, serum bilirubin, ECG chest X-ray and other specific investigation if required according to their relevance.

The patients were randomly divided into 2 groups of 40 patients each.

Group I: [control group]:- Patients received only injection Bupivacaine 15 mg intrathecally.

Group II: Patients received injection Bupivacaine 15 mg with inj. Buprenorphine hydrochloride 0.06 mg intrathecally.

All the patients were informed about visual analogue scale preoperatively. Autoclaved spinal set and anaesthetic drugs were arranged as appropriate. All the study drugs used intrathecally were preservative free.

Before starting anesthesia, all relevant things were kept ready for any emergency during the intraoperative period.

The technique was explained to every patient. A written consent was obtained priorly. All patients received oral Alprazolam 0.25 mg night before surgery. After shifting the patient on operating table preoperative vital parameters were recorded. 20G IV canula was secured. All patients were given 1000 ml of compound sodium lactate solution as a circulatory preload followed by an infusion of 6-10 ml/Kg/hr. Monitors were attached before performing procedure

Patient was positioned in lateral or sitting position as per patients comfort on operation table. Under all aseptic

precautions lumbar puncture was done with 26G quinckes spinal needle at L3-L4 inter vertebral space by using a midline technique. When the free flow of cerebrospinal fluid occurred, syringe containing the injection drug was attached to spinal needle hub tightly; a volume of cerebrospinal fluid aspirated and then the study solution was injected at a slow rate (0.25 ml/s). Immediately after injection, the patients were placed supine; a pillow was kept under shoulder and eyes of patient covered. Time of injection was noted. Other supportive management was also done during the procedures if needed.

Following observations were recorded

- Time of onset of sensory anaesthesia
- Time of onset of motor block
- Level of sensory block
- Duration of surgery
- Duration of motor block
- Duration of sensory block
- Assessment of pain relief
- Duration of absolute analgesia
- Duration of effective analgesia
- Vital parameters
- Any adverse effects

The assessment of results of both groups was done according to the following parameter

- Duration of absolute and effective analgesia
- Degree of analgesia (in terms of onset and trends of VAS till rescue analgesia)
- Effects of spinal anesthesia (in terms of onset and duration of sensory and motor block and complication intra operatively)
- Vigilant monitoring was done to notice any deviation from base line values of pulse rate, respiratory rate and blood pressure (both systolic and diastolic)
- Incidence of complications.

The results were analyzed by unpaired' test and p value.

$$t = \frac{\overline{X_1} - \overline{X_2}}{SE}$$

$\overline{X_1}$ = Mean of firs set of observation

$\overline{X_2}$ = Mean of second set of observation

SE = Standard error

- If p value is < 0.05 then difference between the two set of observation will be considered significant
- If p value is <0.001 then it is considered as highly significant
- If p value is >0.05 then it is considered as non-significant.

RESULTS

Table 1: Age wise distribution of patients.

Age in yeas	Group I (Bupivacaine 15 mg)		Group II (Bupivacaine 15 mg + Buprenorphine hydrochloride 0.06 mg)	
	No	%	No	%
20-30	12	30%	16	40%
30-40	10	25%	12	30%
40-50	16	40%	6	15%
50-60	2	5%	6	15%
Mean±SD	39.3±1.5		38.5±12.2	
Significance test between group				**I and II**
t value				0.203
p value				>0.05

Table 1 shows age wise distribution of cases. Mean age in both the groupswere comparable and statistically insignificant (p>0.05). Mean age in group I was 39.3±1.5 years and group II was 38.5±12.2.

Table 2: Sex wise distribution of patients.

Sex	Group I		Group II	
	No	%	No	%
Male	20	50%	24	60%
Female	20	50%	16	40%

In group II, there was male predominance i.e. M: F was 3: 2, whereas in group I sex ratio was equal (M: F was1:1) (Table 2).

Table 3: Weight wise distribution of patients.

Weight (in kg)	Group I		Group II	
	No	%	No	%
30-40	4	10%	6	15%
40-50	18	45%	16	40%
50-60	14	35%	**12**	**30%**
60-70	4	10%	6	15%
Mean ±SD	49.5±2.5		50.9±8.2	
Significance test between group				**I and II**
t value				0.792
p value				>0.05

Mean weight in both groups were comparable and statistically insignificant (p>0.05). In group I mean weight was 49.5-2.5 kg and 45% pts. Were between 40-50 kg weights. In group II mean weight was 50.9-8.2 kg and 40% patients were between 40-50 kg weights (Table 3).

Maximum number of cases had hysterectomy, 8 each in both groups and herniorraphy 8 in group I, and 10 in group II (Table 4).

Table 4: Distribution of patients according to nature of surgery.

Type if surgery	Group I		Group II	
	No	%	No	%
Gynecological				
Hysterectomy	8	20%	8	20%
Sling operation	2	5%	2	5%
Laparotomy	0	0%	0	0%
Total	**10**	**25%**	**10**	**25%**
Orthopedics				
Amputation	2	5%	2	5%
Patellectomy	2	5%	2	5%
Tibial inter locking	2	5%	2	5%
IMK Nailing	2	5%	2	5%
Miscellaneous	8	20%	6	15%
Total	**16**	**40%**	**14**	**35%**
Surgery				
Appendectomy	2	5%	2	5%
Herniorrhaphy	8	20%	10	25%
Haemorrhoidectomy	2	5%	0	0%
Cystolithotomy	2	5%	2	5%
TURP	0	0%	2	5%
Total	**14**	**35%**	**16**	**40%**
Total	**40**		**40**	

Table 5: Onset of sensory block.

Onset time (in Minutes)	Group I		Group II	
	No	%	No	%
0-1	2	5%	8	20%
1-2	4	10%	14	35%
2-3	2	5%	10	25%
3-4	12	30%	6	15%
4-5	18	45%	0	0%
5-6	0	0%	2	5%
6-7	0	0%	0	0%
7-8	2	5%	0	0%
Mean±SD	4.02±1.23 Min.		2.28±1.31Min.	
Significance test between group			**I and II**	
t value			3.687	
p value			<0.05	

Patients receiving study drug has significantly rapid onset of sensory block as compared to control group ($p<0.05$) (Table 5).

Table 6: Onset of motor block.

Onset time (in Minutes)	Group I		Group II	
	No	%	No	%
0-1	2	5%	2	5%
1-2	2	5%	12	30%
2-3	2	5%	8	20%
3-4	2	5%	14	35%
4-5	20	50%	2	5%
5-6	8	20%	0	0%
6-7	2	5%	0	0%
7-8	2	5%	2	5%
8-9	2	5%	0	5%
Mean±SD	5.07±1.32 Min.		3.03±1.56 Min.	
Significance test between group			**I and II**	
t value			4.135	
p value			<0.05	

Patients of group II had significantly rapid onset of motor block ($p<0.05$) (Table 6).

Table 7: Level of sensory block.

Level	Group I		Group II	
	No	%	No	%
T6	6	15%	4	10%
T_8	18	45%	18	45%
T_{10}	12	30%	10	25%
T_{12}	4	10%	8	20%

The level of sensory block in both groups ranged from spinal segments T6 to T12 (Table 7).

Table 8: Distribution according to duration of surgery.

Duration (in min)	Group I		Group II	
	No	%	No	%
40-80	26	65%	12	30%
80-120	6	15%	12	30%
120-160	4	10%	10	25%
160-200	4	10%	6	15%
Mean±SD	90.8±44.0		115.0±40.0	

The mean duration of surgery in group I was 90.8±44.0, and group II 115.0±40.0 min (Table 8).

Table 9: Duration of motor block.

Onset time (in min.)	Group I		Group II	
	No	%	No	%
90-120	6	15%	0	0%
120-150	10	25%	6	15%
150-180	4	10%	16	40%
180-210	8	20%	14	35%
210-240	4	10%	4	10%
240-270	2	5%	0	0%
270-300	6	15%	0	q
>300	0	05%	0	0%
Mean±SD	190.5±57.2 Min.		186.5±30.1 Min.	
Significance test between group			**I and II**	
t value			0.269	
p value			>0.05	

The mean duration of motor block in group I was 190.5±57.2 min and group II was 186.5±30.1 min (3.12±0.52 hours) (Table 9).

Table 10: Duration of sensory block.

Duration (in min)	Group I		Group II	
	No	%	No	%
90-120	0	0%	0	0%
120-150	10	25%	2	5%
150-180	6	15%	4	10%
180-210	8	20%	18	45%
210-240	8	20%	12	30%
240-270	2	5%	4	10%
270-300	2	5%	0	0%
>300	4	10%	0	0%
Mean±SD	208.8±58.0 Min		211.3±28.8 Min.	
Significance test between group			**I and II**	
t value			0.168	
p value			>0.05	

There was insignificant association in both groups in relation to distribution sensory block (Table 10).

Table 11: Duration of absolute analgesia.

Duration (in hrs.)	Group I		Group II	
	No	%	No	%
0-4	28	70%	0	0%
4-8	12	25%	2	5%
8-12	0	0%	14	35%
12-16	0	0%	14	35%
16-20	0	0%	0	0%
20-24	0	0%	0	0%
>24	0	0%	10	25%
Mean±SD	3.73±0.87 Hrs.		16.2±6.66 Hrs.	
Significance test between group			**I and II**	
t value			8.099	
p value			<0.001	

Table 12: Duration of effective analgesia.

Duration (in hrs.)	Group I		Group II	
	No	%	No	%
0-4	22	55%	0	0%
4-8	18	45%	0	0%
8-12	0	0%	8	20%
12-16	0	0%	10	25%
16-20	0	0%	12	30%
20-24	0	0%	0	0%
>24	0	0%	10	25%
Mean±SD	3.91±0.88Hrs.		18.38±6.57Hrs.	
Significance test between group			**I and II**	
t value			9.515	
p value			<0.001	

In group II maximum 28 patients (70%) had analgesia between 8 to 16 hours. The mean duration of analgesia was 16.2±6.66 hours. Duration of absolute analgesia is significantly higher in group II (Table 11).

In group I maximum 22 patients (55%) had analgesia less than 4 hours, mean duration was 3.91±0.88 hours. In group II maximum 22 patients (55%) had analgesia of 12 to 20 hrs. 10 Patients (25%) had analgesia of more than 24 hours. Maximum duration of analgesia was 36.67 hours in one patient of group II. The mean duration of analgesia was 18.38±6.57 hours. Duration of effective analgesia is significantly higher in group II (Table 12).

Table 13: VAS score.

Mean VAS score	Group I	Group II
At Ist complaint of pain	7.62±2.12	2.98±1.65
At Ist rescue of analgesia	8.46±2.31	5.89±1.02
Over all 24 hours.	6.95±4.52	3.42±2.01
Significance test between group		**I and II**
t value		4.308
p value		<0.05

VAS score is significantly lower in group II patients (Table 13).

There was no statistically significant change in systolic blood pressure attributable to intrathecal buprenorphine (p>0.05) (Table 14). Changes in diastolic blood pressure are statistically insignificant (p>0.05) in group II when compared to group I (Table 15).

Table 14: Changes in systolic blood pressure.

Time	Group I	Group II	t test group I and II
(SBP in mm of Hg)	Mean±SD	Mean±SD	
Pre-operative	124.60±7.51	124.50±7.48	>0.05
5 min after SAB	120.60±4.82	120.90±4.84	>0.05
15 min after SAB	107.90±2.79	108.70±2.22	>0.05
30 min after SAB	108.70±7.68	108.40±8.11	>0.05
1 hours after SAB	113.60±4.18	113.70±4.35	>0.05
6 hours after SAB	117.10±4.17	116.70±4.66	>0.05
12 hours after SAB	121.20±3.12	121.30±3.42	>0.05
18 hours after SAB	123.90±0.00	123.70±3.76	>0.05
24 hours after SAB	122.10±3.43	122.20±3.46	>0.05

Table 15: Changes in diastolic blood pressure.

Time	Group I	Group II	t test group I and II
(SBP in mm of Hg)	Mean±SD	Mean±SD	
Pre-operative	80.40±4.59	80.20±4.19	>0.05
5 min after SAB	79.30±2.92	79.60 3.07	>0.05
15 min after SAB	68.60±1.43	68.90±1.48	>0.05
30 min after SAB	71.80±2.82	71.80±2.96	>0.05
1 hour after SAB	74.30±3.48	74.20±3.79	>0.05
6 hours after SAB	74.40±2.91	77.60±3.14	>0.05
12 hours after SAB	79.80±2.18	80.00±2.28	>0.05
18 hours after SAB	79.80±1.90	80.10±2.14	>0.05
24 hours after SAB	80.10±2.41	80.10±2.14	>0.05

Table 16: Changes is pulse rate.

Time	Group I	Group II	t test group I and II
(SBP in mm of Hg)	Mean±SD	Mean±SD	
Pre-operative	79.40±5.87	77.80±5.44	>0.05
5 min after SAB	81.10±2.57	80.60±2.54	>0.05
15 min after SAB	74.60±2.46	74.20±2.27	>0.05
30 min after SAB	75.20±5.64	74.20±5.29	>0.05
1 hour after SAB	75.90±4.61	75.00±4.49	>0.05
6 hours after SAB	80.60±2.01	8.30±2.12	>0.05
12 hours after SAB	79.00±2.24	79.00±2.65	>0.05
18 hours after SAB	80.00±3.52	79.00±3.87	>0.05
24 hours after SAB	80.10±3.30	79.20±3.54	>0.05

There was no statistically significant change in pulse rate of group II patients as compared to base line and as compared to control group (group I) ($p>0.05$) (Table 16).

There was no statistically significant change in respiratory rate of group II patients as compared to base line and as compared to control group (Table 17).

Table 17: Changes in respiratory rate.

Time	Group I	Group II	t test group I and II
(SBP in mm of Hg)	Mean±SD	Mean±SD	
Pre-operative	15.20±1.12	15.50±1.24	>0.05
5 min after SAB	16.70±1.14	17.10±1.48	>0.05
15 min after SAB	17.20±1.33	15.70±1.31	>0.05
30 min after SAB	15.50±1.07	16.30±1.45	>0.05
1 hour after SAB	15.70±1.45	16.15±1.39	>0.05
6 hours after SAB	15.90±1.30	16.25±1.09	>0.05
12 hours after SAB	16.10±0.94	17.40±1.50	>0.05
18 hours after SAB	15.90±1.34	16.45±1.32	>0.05
24 hours after SAB	15.55±1.02	15.85±1.24	>0.05

Table 18: Incidence of side effects.

Side Effect	Group I		Group II	
	No	%	No	%
Nausea and vomiting	2	5%	2	5%
Hypotension	0	0%	0	0%
Brady cardia	0	0%	0	0%
Shivering	4	10%	2	5%
Res. depression	0	0%	0	0%
dizziness	0	0%	0	0%
Pruritus	0	0%	4	10%
Urinary retention	2	5%	4	10%
Dryness of mouth	0	0%	0	0%
Headache	0	0%	0	0%
Backache	0	0%	0	0%
Significance test between group			**I and II**	
t value			9.515	
p value			<0.001	

Nausea and vomiting was seen in 2 patients (5%) of group I, and 2 patients (5%) of group II. Urinary retention was seen in 2 patients (5%) of both groups. Shivering was seen in 4 patients (10%) of group I and 2 patients (5%) of group II. Pruritus was seen only 4 cases (10%) in group II. No patient had headache or backache or dryness of mouth (Table 18).

DISCUSSION

In the current study, patients received intrathecal buprenorphine had significantly rapid onset of analgesia. ($p<0.05$).

Thomas W, Abraham V and Kaur B conducted a study on 60 patients of two Groups. One Group received 15 mg bupivacaine with 1 μg/kg (maximum 50 μg) buprenorphine intrathecally and other group received only bupivacaine 15 mg intrathecally (control group). They found that onset of analgesia in buprenorphine group varies from 0.5 to 5.6 min with a mean of 2.37 min. In control group onset of analgesia varied from 4 to 11 min, mean onset time was 6.73 min. Buprenorphine being a lipid soluble Opioid has faster onset of action. The results were comparable with our study.[10]

Mean duration of motor block in group I was 190.5±57.2 min, and group II 186.5±30.1. Mean duration of sensory block in group I was 208.8±58min and in group II it was 211.3±28.8. Intrathecal buprenorphine does not affect the duration of sensory and motor block of local anaesthetic (p>0-05). Another study found that intrathecal buprenorphine does not affect the sensory and motor block. The results of our study are similar to studies of Tan PH et al, Liu SS et al, Tan PH et al, and Batra YK et al.[11-14]

In group I mean duration of absolute analgesia was 3.73±0.87 hours and mean duration of effective analgesia was 3.91±0.88 hours. Most of the patients had analgesia < 4 hours.

In group II mean duration of absolute analgesia was 16.21±6.66 hours and mean duration of effective analgesia was 18.38±6.57 hours. Maximum patients had 12-20 hours of effective analgesia. The duration of analgesia is significantly prolonged in group II patients (p<0.05). The difference in mean duration of analgesia in both group swas significant. Intrathecal buprenorphine provides longer duration of analgesia (i.e.18.31±6.51 hours.).

Thomas W et al administered 1 μg/kg up to maximum 50 μg buprenorphine intrathecally for postoperative pain relief. They found that the duration of analgesia was longer with the addition of buprenorphine to bupivacaine 15.25 hours (mean) than bupivacaine 3.8 hours (mean) alone when administered intrathecally. Their observations are similar to our study.[10] Lalla RK used low dose of intrathecal buprenorphine along with lignocaine for postoperative analgesia. He observed that the mean duration of analgesia was 11 hours with 40 μg buprenorphine and 22 hours with 80 μg of buprenorphine, which is similar to our study.[15] Chansoriya KP et al used 0.03 mg and 0.06 mg intrathecal buprenorphine for postoperative pain relief and found the duration of analgesia 20 hours and 28 hours respectively. These results are similar to our study.[16]

Jagtap et al compared analgesic effect of intrathecal buprenorphine and pethidine. The duration of analgesia for buprenorphine was 19 hours and for pethidine was 11 hours. These findings are similar to our study.[17] Thomas W et al have evaluated patients for efficacy of analgesia using magills classification for degree of pain. They found that difference in intensity of analgesia in the study group (buprenorphine) was statistically significant when compared to control group.[10] The results of our study are similar to the results of studies of Kim MH et al, Batra YK, Tan PH et al, Lauretti GR et al, Thomas W et al and Jong C et al.[10,11,14,18-20]

There was no statistically significant change in pulse rate, blood pressure and respiratory rate attributable to intrathecal buprenorphine during intra operative and post-operative period. Chansoriya KP et al in their study on intrathecal buprenorphine for post-operative pain relief did not find any significant change in respiratory rate, pulse rate and blood pressure.[16] Thomos W et al found no statistically significant change in pulse rate, blood pressure and respiratory rate during intra-operative and post-operative period when intrathecal buprenorphine is administered for post-operative pain relief.[10]

Thomas W et al in their study on intrathecal buprenorphine for postoperative pain relief found nausea in 10 % patients, vomiting in 13.3% patients and urinary retention in 26.7% patients.[10] Chansoriya KP et al found urinary retention in 6% patients after intrathecal buprenorphine similar to our study.[16] Lalla RK, found urinary retention in 3 patients (out of 35) and nausea and vomiting in 3 patients after intrathecal administration of buprenorphine, which is similar to our study.[15]

Opioid receptors are present in throughout the nervous system. Buprenorphine a lipid soluble opioid has faster onset of action. When administered intrathecally it is rapidly soaked up in the lipid tissue of spinal cord and lesser concentration of drug remains in CSF so that less respiratory depression.

Buprenorphine forms a very avid drug receptor complex which tends to persists for longer periods without dissociation. The affinity of buprenorphine for opiate receptor is about 50 times more than that of morphine, hence produce a greater duration of analgesia.

Intrathecal buprenorphine 0.06 mg provided longer duration of analgesia. 25 % patients had analgesia of >24 hours. Maximum duration of analgesia was up to 36 hours. Intrathecal buprenorphine does not affect the characteristics of spinal anaesthesia and vital parameters. It provides rapid onset of analgesia due to its highly lipophilic property. Quality of analgesia is excellent. Side effects are minimal. The intrathecal route has also advantage of greater technical ease and single injection produces sufficient duration of analgesia. Intrathecal buprenorphine provided prolonged postoperative analgesia without any significant increase in side effects. The quality of surgical anaesthesia and postoperative analgesia were excellent. Other studies also showed that use of buprenorphine significantly increases the duration and better quality of postoperative analgesia. [21-23]

CONCLUSION

On the basis of observation and results of this study conclude that buprenorphine has been found to be superior for postoperative analgesia as compared to control group. Hence low dose intrathecal buprenorphine which offers convenient, simple, inexpensive, effective and safe means of excellent postoperative analgesia be the drug of choice for postoperative analgesia.

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