Original Research Article

Epidural Butorphanol : Comparison of two different doses in Lower abdominal surgery

Vikas Laxmanrao Chaudhari[1], Amol B. Thakare[2*], Yogesh N Zanwar[3]

[1]Assistant Professor, Department of Anaesthesiology,Indira Gandhi Government Medical College & Hospital, Nagpur, India
[2]Associate Professor, Department of Anaesthesiology,Government Medical College, Chandrapur, India
[3] Assistant Professor, Department of Anaesthesiology,GMC & SSH, Nagpur, India

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Abstract

Background: For lower abdominal surgeries, nowadays epidural anaesthesia is preferred. To cover the pain after surgery is the anaesthesiologist work. Butarphanol is synthetic opioid which has better effect on post-operative analgesia. The study participants were divided into Control group, Group A receiving 1mg of butarphanol& Group B receiving 2mg of butarphanol. **Objectives:** The study was conducted to compare two doses 1mg & 2mg of butarphanol for quality of anaesthesia, quality of motor blockade, duration of post-operative analgesia etc. **Methods –** It was cross sectional studywas conducted at Department of Anaesthesiology, Government Medical College, over a period extending from January 2007 to November 2008. **Results:**The onset of sensory blockade was found to occur in less than 1 minutes in group B receiving 2mg of butarphanol. In group B, complete motor blockade in about 10.15±0.86 minutes followed by in group A in 13.27±1.67 minutes. Group B patients had maximum sensory blockade for 3.8±0.40 hours & motor blockade for 2.72±0.32 hours. About 82.5% & 77% patients in Group B & A respectively has excellent quality of anaesthesia. Somnolence was the commonest adverse effect seen in about 70% of group B & 40% of group A patients. **Conclusion:**Butarphanol through epidural route in different doses can provide you better sensory & motor blockade, better quality of anaesthesia, maximum duration of post-operative analgesia.

Keywords: Butarphanol, Epidural anaesthesia, Sensory blockade, Motor blockade, post-operative analgesia.

Introduction

For the lower abdominal surgery, nowadays spinal & epidural anaesthesia is commonly preferredi.e. Central neuraxial blockade. the advantages of these newer method of the anaesthesia are that they decreases surgery stress, reduce incidence of post-operative nausea & vomiting, reduce surgery bleeding &can be easily converted to post-operative analgesia.[1] Butorphanol, synthetic opioid is a strong k receptor agonist, a weak μ receptor agonist-antagonist and is relatively lipid soluble. For this reason it should produce less respiratory depression and a reduced incidence of pruritus and nausea and vomiting which is common phenomenon with morphine.[2]Pain after surgery is inevitable. Hence, relieving pain is one of the fundamental responsibilities of anaesthesiologists and is frequently a primary goal for which patients are seeking care.[3] The epidural route is more popular for postoperative pain management as the technique can be used alone or in combination with general anaesthesia. Epidural technique has been found to provide better pain relief than systemic opioids and also decreased incidence of postoperative complications.[4]Epidural administration of narcotic analgesics is the standard therapy for postoperative analgesia in EP anaesthesia. [5] However, they are associated with troublesome effects like respiratory depression, urinary retention, pruritus, nausea, and vomiting.[6,7]The purpose of this

**Correspondence*
Dr. Amol B. Thakare
Associate Professor, Department of Anaesthesiology, Government Medical College, Chandrapur,India.
E-mail: amolnew81@gmail.com

study was to compare epidural butorphanol in two different doses in a patients undergoing lower abdominal surgeries.

Aim & Objectives

1.To Study the onset and peak effect of sensory and motor blockade.
2.To study the duration of post-operative analgesia.
3.To study the incidence and nature of adverse effect.

Methodology

The present study was conducted at Department of Anaesthesiology, Government Medical College, over a period extending from January 2007 to November 2008.

Study Design: Prospective cross sectional study.

Study Population: The study population included 120 female patients, belonging to ASA grade I & II, posted for planned (Elective) surgery on lower abdomen and pelvis under epidural block.

Sampling Method – Duration method sampling were used. During the total study duration about 120 patients were enrolled in the present study.

The selected patients were divided into the following group randomly one after one

I.**Control:** receiving 16-18 ml of solution containing local anaesthetic mixture of lignocaine with adrenaline and bupivacaine.

II.**Group A:** receiving 16-18 ml of solution containing local anaesthetic mixture of lignocaine with adrenaline and bupivacaine and 1 mg Butorphanol.

III.**Group B:** receiving 16-18 ml of solution containing local anaesthetic mixture of lignocaine with adrenaline and bupivacaine and 2 mg Butorphanol.

No premedication were given to the patients.The positioning to the patient was properly given& the skin was infiltrated with local anaesthetic 1% lignocaine in midpoint. The patient is then inserted with the Epidural needle and after that epidural catheter were introduced to provide the medication as the group allotted. Patients were observed for time required for onset (dull sensation to pin prick) and peak effect (no sensation felt) of sensory and motor blockade. The patients were observed for the onset & quality of surgical anesthesia, sedation, intraop pulse rate, systolic &Diastolic blood pressure etc

Results

Table 1:Characteristics of Sensory & Motor blockade

Characteristics	Control(n = 40)	Group A(n=40)	GroupB(n=40)	p-value
Time for Sensory onset (Secs)	144.25± 24.71	81.62±18.02	41.25±16.20	< 0.05
Time for complete sensory Blockade (Min)	9.13±0.65	6.06±0.64	4.30±0.40	< 0.05
Time for Motor Onset (Min)	7.67±0.52	5.15±0.63	3.80±0.33	< 0.05
Time for Complete Motor Blockade (Min)	17.15±1.29	13.27±1.67	10.15±0.86	< 0.05
Dermatomal level T6 Achieved at(Min)	13.75±1.19	11.15±1.07	8.50±0.78	< 0.05

From the above table we come to know that maximum time for the onset of the sensory blockade was 144.25± 24.71 seconds in control group, while group A & B were having sensory blockade onset in 81.62±18.02&41.25±16.20 in seconds respectively. Also, time for complete sensory blockade was maximum9.13±0.65 for control group and minimum 4.30±0.40 in group B. when looked for motor blockade control group had onset in 7.67±0.52& complete motor blockade in 17.15±1.29 minutes. While, group A & B motor blockade onset in 5.15±0.63&3.80±0.33 minutes respectively and complete motor blockade in 13.27±1.67&10.15±0.86 minutes respectively. Also, group B achieved dermatomal T6 level in minimum 8.50±0.78 minutes. The difference between the groups in all above factors were found to be statistically significant. Thus, this indicate that group B receiving 2mg of burtarphanol achieved sensory & motor blockade in minimum time.

Table 2:Duration of Sensory & motor blockade & post op analgesia

Characteristics	Control(n = 40)	Group A(n=40)	Group B (n=40)	p-value
Duration of Sensory & Motor Blockade				
Duration of Sensory Blockade(hrs)	2.63±0.27	3.23±0.22	3.8±0.40	P < 0.05
Duration of Motor Blockade (hrs)	2.11±0.22	2.46±0.26	2.72±0.32	P < 0.05
Duration of Post Operative Analgesia				
Upto 4hrs	37 (92.5%)	4 (10%)	0 (0.0%)	P < 0.05
4-6 hrs	3(7.5%)	34 (85%)	19 (47.5%)	
>6 hrs	0 (0.0%)	2 (5%)	21 (52.5%)	
Mean ± SD	3.02±0.57	4.93±0.67	6.43±0.81	

The above table showed that total duration of sensory blockade was found to be 2.63±0.27, 3.23±0.22 &3.8±0.40 in control, group A & group B respectively. The difference between the duration of sensory blockade among the groups were found to be statistically significant (p-value < 0.05). While, total duration of motor blockade was maximum 2.72±0.32 group B followed by 2.46±0.26 in group A. this difference among the groups were found to be statistically significant (p-value < 0.05). Also, when compared for duration of post operativeanalegesia, maximum 52.5% of group B patients had analgesia for > 6 hours. While, in group A maximum 85% were having analgesia for 4-6 hours and in control group about 95% patients had post operative analgesia < 4 hours. The diference between post operative analgesia duration was found to be statistically significant (p-value < 0.05) indicating the group B patients receiving 2mg of butarphanol had maximum duration of sensory blockade, motor blockade & post-operative analgesia.

Table 3 :Assessment of Quality of motor blockade, surgical anaesthesia & sedation score

Characteristics	Control(n = 40)	Group A(n=40)	Group B (n=40)	p-value
Quality of Motor Blockade by Bromage Scale				
0	0 (0.0%)	0 (0.0%)	0 (0.0%)	-
1	1(2.5%)	0 (0.0%)	0 (0.0%)	
2	9 (22.5%)	4 (10.%)	2 (5%)	
3	30 (75.%)	36 (90%)	38 (95%)	
Quality of Surgical Anaesthsia.				
Excellent	28 (70%)	31(77.5%)	33 (82.5%)	< 0.05
Fair	10 (25%)	8 (20%)	6 (15%)	
Poor	2 (5%)	1 (2.5%)	1 (2.5%)	
Sedation Score				
0	38(95%)	10(25%)	6(15%)	-
1	2(5%)	18(45%)	11(27.5%)	
2	0 (0.0%)	12(30%)	23(57.5%)	
3	0 (0.0%)	0 (0.0%)	0 (0.0%)	

When compared quality of motor blockade by bromage scale, it was found that about 95% of group B patients were on bromage scale of 3. While, about 90% of group A & 75% of control were on bromage scale 3. Thus, this indicate that 2mg of butarphanol provide better quality of motor blockade than 1mg of butarphanol& control. When compared quality of surgical anesthesia about 82.5% of group B, 77.5% of group A & 70% of control had achieved excellent anesthesia. While, about 2.5% of each group A & B and 5% of control were found to have poor quality of anesthesia. This difference among the group for quality of anesthesia was found to be statistically significant (p-value < 0.05). Also, about 57.5% of group B has achieved sedation score of 2 while, 95% of control patients were having sedation score of 0.

Table 4: Comparison between the groups for Adverse effects

Complications	Control	Group A	Group B
Somnolence	1(2.5%)	16(40%)	28(70%)
Pruritus	0	0	1(2.5%)
Nausea / Vomiting	2 (5%)	4(10%)	5(12.5%)

When compared for the adverse effects, it was found that about 70% of group B patients had somnolence as adverse effect, while about 40% group A somnolence as adverse effect. Also, maximum 12.5% of group B, 10% of group A & 5% of control found to have nausea/vomiting as the adverse effects. Besides these no other serious adverse effects were seen in all three groups indicating that both 1mg & 2mg of butarphanol doses did not have serious adverse effect after epidural effusion.

Discussion

In our present study, out of all 3 groups, Group B receiving 2mg of butarphanol achieved fastest onset of sensory analgesia in 41.25±16.20 secs (p-value < 0.05) & complete sensory blockade in 4.30±0.40 mins (p-value < 0.05). While, patients receiving 1mg of butarphanol in group A had onset of sensory blockade in 81.62±18.02 secs& complete sensory blockade in 6.06±0.64 mins. Mean time Required for onset of Motor Block was 7.67±0.52 mins in control group, 5.15±0.63 mins in group A, while 3.80±0.33 mins in

Group B (P < 0.05).Mean Time needed for Peak effect of Motor Block was 17.15±1.29 mins in control group, 13.27±1.67 mins in group A, while 10.15±0.86 mins in Group B (P < 0.05).This indicate that better the dose of butarphanol, faster is the onset & complete blockade. **Aditi A. Dhimar, Mamta G. Patel et al** reported that , for Sensory effect onset was 25±7.07 sec and peak effect 312.5±12.4 sec in Group A (2 mg) patients as compare to Group B (3 mg) where is was 12.81±21.68 secs and 162.8±21.68 sec respectively which is statistically significant (P<0.05)For Motor effect onset was 3.5±1.01 min and peak effect 11.4±3.91 min in Group A patients as compare to Group B where is was 2.7+0.67 min and 6.09+0.97 mins respectively which is statistically significant (P<0.05).[8]Our study is comparable with AditiDhimar et al study as onset and peak effect of sensory block and motor block in 2mg butorphanol group are statistically significant in both studies . The difference in time duration in sensory and motor parameters in minimal. This is because different mean age of patients in both studies and small sample size in AditiDhimar's study.In our present study, it was found that near about all patients belonging to Group A receiving 1mg butarphanol& group B receiving 2mg of butarphanol were having quality of anesthesia by Bromage scale of 2 or 3. The study conducted by **Catherine O. Hunt, Naulty J. S. et al (1988)** in their study of epidural butorphanol-bupivacaine noted the degree of motor block. About 50% of patients given only bupivacaine and bupivacaine with 1 mg butorphanol group had a motor score of 1 or 2.[9] The difference between both study results might be due tmore amount of 0.25% Bupivacaine used in control and 1 mg group and small sample size in Catherine O Hunt study.Also, in our study, more than half of group B & about 30% of group A were having sedation score of 2. While, AditiDhimar et al in their study noted the sedation score of 2 in 80% of patient with 2 mg butorphanol and 85% of patient with 3 mg butorphanol. [8] The difference might be due to different methodology, different set of patients or small sample size. Again in our present study, that total duration of sensory blockade was found to be 2.63±0.27, 3.23±0.22&3.8±0.40 in control, group A & group B respectively and total duration of motor blockade was maximum 2.72±0.32 group B followed by 2.46±0.26 in group A. This difference among the groups were found to be statistically significant (p-value < 0.05). Also, more than 90% of group A & B were found to have post operative analgesia while, about 95% of control group provide post operative analgesia for less than 4 hours. The similar results were shown by the study conducted **by Palacios QT et al** where they studied epidural butorphanol 1, 2 and 4 mg comparing with morphine 5 mg for postoperative analgesia in 92 healthy, term parturients and reported that the time to onset of epidural analgesia following butorphanol was more rapid than following morphine.14%, 22% and 17% of patients treated with butorphanol 1 mg, 2 mg and 4 mg respectively, had not requested supplemental medication at eight hours and that one patient in the later group had adequate analgesia for 24 hours.[10] In present study, about 70% of group B patients showed somnolence as adverse effect followed by 40% of group A patients. Also, only single patient in group B had pruritus. While, about 12.5% of patients of group B had nausea/vomiting. The similar results were shown by study conducted by Palacios QT and Colleagues (1991), in their study noted pruritus in 1.4% of the butorphanol group compared with 43% of morphine patients.[10]

Conclusion

The present study was conducted to compare the two doses of butarphanol through epidural anaesthesia. Group B receiving 2mg of butarphanol had onset of sensory blockade in less than minute and complete sensory blocked in 4-5 minutes. While, control group had onset of sensory blockade in 2 to 2.5 minutes and complete by 9-10 minutes. When compared for the motor blockade, group B required minimum time to have onset & complete blockade. It was found that group B patients had maximum of 3.5 to 4.5 hours of sensory blockade & 2.5 to 3 hours motor blockade. Upto 90% of patients in group A (1mg) & group B (2 mg) receiving butarphanol had duration of post-operative analgesia for more than 4 hours. More than 90% of groups receiving butarphanol had bromage scale of 3. Maximum patients in group A & B receiving butarphanol had excellent quality of anaesthesia& sedation score of 2 or 3. The most common adverse effects shown in patients receiving butarphanol was somnolence, but there was no other serious adverse effect. Thus, we can conclude that butarphanol through epidural route in different doses can provide you better sensory & motor blockade, better quality of anesthesia, maximum duration of post-operative analgesia.

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