International Journal of Medical Research Professionals

Original Article

Analysis of Epidural Clonidine as an Adjuvant to Local Anaesthetic in Lower Abdominal and Lower Limb Surgeries at a Tertiary Care Hospital

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Article History
Received: 17 Oct 2015
Revised: 01 Nov 2015
Accepted: 19 Nov 2015

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ABSTRACT

Background: The addition of an adjuvant extends and reinforces the sensory blockade produced by local anaesthetics with reduction in dose of the later, thus dipping the side-effects. The present study was conducted to evaluate epidural clonidine as an adjuvant to local anaesthetic in lower abdominal and lower limb surgeries at a tertiary care hospital.

Materials & Methods: In the present study 50 patients were included in the studies that were undergoing elective lower abdominal and lower limb surgeries under epidural anesthesia at a tertiary care Hospital. Patients were randomly divided into 2 groups of 25 patients each; Group I: 0.5% bupivacaine + 0.9% normal saline, 1 ml and Group II: 0.5% bupivacaine + Inj. Clonidine 2µg/kg (1 ml). Analgesic Duration, Motor Block and sedation score was noted for both groups. SPSS 11.5 software was used to perform statistical analysis. *P*-value < 0.05 was considered statistically significant.

Results: Duration of motor blockade (in mins) was 110 ± 12.34 and 231 ± 45.46 in the group I and group II respectively. The clonidine group had a significant prolongation of the motor block (p-value < 0.001). Duration of analgesia (in mins) was 138 ± 12.54 and 382 ± 65.12 in group I and group II, respectively. The analgesic duration was significantly prolonged in the clonidine group (p-value < 0.001). The group II had patients with a sedation score of 3 and above, which was statistically significant.

Conclusion: The present study concluded that the clonidine group had a significant prolongation of the motor block, the analgesic duration was significantly prolonged in the clonidine group and sedation score of 3 and above.

KEYWORDS: Bupivacaine, Clonidine, Epidural Anesthesia.

INTRODUCTION

Anesthetic Postoperative pain may give rise to various physiological and psychological phenomena and hence postoperative pain treatment should be an integral component of the routine surgical and anaesthetic management because it can help to reduce morbidity and complications as well as accelerate rehabilitation.[1] Epidural anesthesia is the most commonly used technique for providing not only peri-operative surgical anesthesia but post-operative analgesia in lower abdominal and limb surgeries.[2]

Epidural anesthesia with local anesthetics, reduces physiologic responses to surgery and also provides superior pain relief.[3] Various adjuvants like opioids, epinephrine, clonidine, ketamine, neostigmine, adenosine, midazolam, magnesium, verapamil, ketorolac, *etc*. have been tried with local anesthetics in the epidural space, to enhance analgesia while minimizing side effects.[4] Clonidine, an alpha2-adrenergic agonist produces analgesia without causing significant respiratory depression after caudal administration in children.[5]

Using clonidine as an adjuvant enables us to use a lower concentration of the local anaesthetic to achieve the same level of analgesia with the advantages of prolonged duration of analgesia, reduced residual motor blockade and increased margin of safety.[6]

However, clonidine can cause hypotension and bradycardia.[7] The present study was conducted to

evaluate epidural clonidine as an adjuvant to local anaesthetic in lower abdominal and lower limb surgeries at a tertiary care hospital.

MATERIAL & METHODS

The present study was conducted in Department of Anaesthesia, Goldfield Institute of Medical Sciences & Research, Chhainsa, Faridabad, Haryana (India) for evaluating the efficacy of epidural Clonidine as an Adjuvant to Local Anaesthetic in Lower Abdominal and Lower Limb surgeries.

In the present study 50 patients were included in the studies that were undergoing elective lower abdominal and lower limb surgeries under epidural anesthesia at a tertiary care Hospital. Before the initiation of the study, ethical approval was taken from the Ethics committee and written informed consent from patients aged between 18 to 60 years of ASA physical status 1 or 2 were obtained. Patients with absolute or relative contraindications for epidural, ASA grade 3 or 4, with an adverse reaction to local anesthetics, on alpha-adrenergic receptor blockers, calcium channel blockers, ACE inhibitors were excluded from the study. Patients were randomly divided into 2 groups of 25 patients each; Group I: 0.5% bupivacaine + 0.9% normal saline, 1 ml and Group II: 0.5% bupivacaine + Inj. Clonidine 2µg/kg (1 ml). A pre-anesthetic evaluation was done for all patients on the day prior to surgery regarding history, general physical examination and relevant investigations. Baseline vital signs were recorded. Pre-operative preparation included a period of overnight fasting. Patients were introduced to the Visual Analogue Scale (VAS) and were taught how to use it. Zero end of the scale was taken as no pain and 10 as maximum possible pain imaginable. After patients were transferred to the operating room, an Intravenous (IV) access was secured in the non-dominant upper limb using an 18G IV cannula. 10-15 ml/kg of IV crystalloid solution was given over 15 minutes just before administering epidural anesthesia. Minimum mandatory monitors like a pulse oximeter, non-invasive blood pressure and electrocardiogram were used and baseline oxygen saturation (SpO_2), Blood Pressure (BP) and pulse were noted. The patients were positioned in the lateral decubitus/ sitting position. Under absolute asepsis, L2-L3 interspace was punctured with an 18G Tuohy needle after infiltration of the skin and interspinous space with 2% plain lignocaine. Epidural space was identified with loss of resistance technique with saline. An 18G epidural catheter was then passed through the Tuohy needle and was left 4-5 cm into the epidural space in cephalad direction. A test dose of 3cc of 2% lignocaine with adrenaline 1:200,000 was given. BP, Pulse Rate (PR), Electrocardiograph (ECG) and SpO_2 were monitored intraoperatively. PR, BP and SpO_2 were measured at an interval of every 5 min up to 30 min, then at 15 min interval upto 60 min and thereafter at 30 min interval till the end of surgery. After confirming that there was no catheter misplacement, the control group(I) received 0.5% bupivacaine and 1 ml of 0.9% normal saline whereas the clonidine group (II) received 0.5% bupivacaine and 1ml of 2ug/kg of clonidine. During surgery, crystalloid intravenous fluids were administered at a rate of 150 ml/hr. Depending on perioperative blood loss and hemodynamic instability, additional IV fluids (crystalloids, colloids and blood) were administered. Analgesic Duration, Motor Block and sedation score was noted for both groups. SPSS 11.5 software was used to perform statistical analysis. *P*-value < 0.05 was considered statistically significant.

Table 1: Duration of motor blockade (in minutes).

Time in Minutes	Group I	Group II
Minimum time	92	182
Maximum time	132	317
Mean ± SD	110±12.34	231±45.46

Table 2: Duration of analgesia (in minutes).

Time in Minutes	Group I	Group II
Minimum time	122	252
Maximum time	167	457
Mean ± SD	138 ± 12.54	382 ± 65.12

Table 3: Sedation score in both groups

Sedation score	Group I	Group II
1	11	0
2	14	2
3	0	7
4	0	11
5	0	5

RESULTS

Patients were randomly divided into 2 groups of 25 patients each; Group I: 0.5% bupivacaine + 0.9% normal saline, 1 ml and Group II: 0.5% bupivacaine + Inj. Clonidine 2µg/kg (1 ml). Duration of motor blockade (in mins) was 110 ± 12.34 and 231 ± 45.46 in the group I and group II respectively. The clonidine group had a significant prolongation of the motor block (p-value < 0.001). Duration of analgesia (in mins) was 138 ± 12.54 and 382 ± 65.12 in group I and group II, respectively. The analgesic duration was significantly prolonged in the clonidine group (p-value < 0.001). The group II had patients with a sedation score of 3 and above, which was statistically significant.

DISCUSSION

Pain is perhaps the most feared symptom of disease, which a human being has always trying to alleviate and conquer since ages. Epidural anesthesia is considered as a gold standard technique as it provides complete and dynamic anesthesia. The benefits include suppression of stress response by sympatholysis, stable hemodynamics with reduction in cardiac morbidity, reduction in pulmonary complications due to active physiotherapy and early mobilization, reduced blood loss and decrease in thromboembolic complications following surgery.[8-10] Duration of motor blockade (in mins) was 110 ± 12.34 and 231 ± 45.46 in the group I and group II respectively. The clonidine group had a significant prolongation of the motor block (p-value < 0.001). Duration of analgesia (in mins) was 138 ± 12.54 and 382 ± 65.12 in group I and group II, respectively. The analgesic duration was significantly prolonged in the clonidine group (p-value < 0.001). The group II had patients with a sedation score of 3 and above, which was statistically significant.

Krishnamoorthy K et al found that addition of clonidine to bupivacaine definitely improves the quality of analgesia by reducing the overall pain score, prolonging the duration of the time of first rescue analgesia and causing reduction of total analgesic consumption in the postoperative period without any hemodynamic instability. Sedation may be beneficial during the intraoperative period.[11]

CONCLUSION

The present study concluded that clonidine is promising in prolonging the duration of motor block, analgesia as well as able to keep patient sedated for that duration. Hence increases the patient comfort level during and after the surgery if it is used as an adjuvant.

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How to cite the article: Nirupma Bansal, Aarti Jain. Analysis of Epidural Clonidine as an Adjuvant to Local Anaesthetic in Lower Abdominal and Lower Limb Surgeries at a Tertiary Care Hospital. Int J Med Res Prof. 2015; 1(3); 266-68.