

Effect of Combined Epidural Anaesthesia Using 0.125% Inj Levobupivacaine Hydrochloride with General Anaesthesia for Hemodynamic Stability Intraoperatively and Post-Operative Analgesia in Emergency Exploratory Laparotomy Patients

Nikhath Parkar¹, Ritika Negi²

Abstract: **Background:** The aim of the study was to evaluate the efficacy of combined General Anesthesia - Epidural Anesthesia (CEGA) for hemodynamic stability in the intraoperative period and post-operative analgesia **Method:** Authors conducted a prospective study, in which 40 patients undergoing exploratory laparotomy received combined GA and Epidural Anesthesia (CEGA). Authors analyzed the effect of combined epidural general anesthesia with regards to hemodynamic parameters (heart rate, systolic and diastolic blood pressure), post-operative analgesic requirement (intraoperative requirement of fentanyl) and postoperative analgesia (VAS score). **Results:** Authors found significant decrease in the heart rate, systolic and diastolic blood pressure in response to intraoperative surgical stress response in these patients. No rescue analgesia was required in post-operative period. Pain score (VAS- Visual Analogue Scale) score was also evaluated which was remarkable. There were no significant intraoperative and postoperative complications noted in these patients. **Conclusion:** Authors concluded that the use of epidural along with general anesthesia helps in attenuating hemodynamic changes due to surgical stress response in exploratory laparotomy, which results in maintaining stable intraoperative and postoperative hemodynamics. Combining epidural with general anesthesia results in rapid recovery and also helps in providing good postoperative analgesia.

Keywords: Combined GA-epidural anesthesia, Postoperative analgesia

1. Introduction

Epidural analgesia is commonly being used for major open abdominal procedures^{1,2,3}. The incidence of postoperative pain, especially in upper abdominal surgeries, has effects like reduced pulmonary compliance, leading to retention of secretions, atelectasis, and pneumonia⁴. Epidural analgesia is used nowadays to promote early mobilization, reduction of post-operative pain, and reduction of the length of hospital stay.^{5,6}

Levobupivacaine is the S enantiomer of bupivacaine. It is gaining popularity in regional anaesthesia techniques and is highly efficacious and safe with a good pharmacokinetic profile. Its decreased toxicity is related to its higher protein binding property. It is highly effective for post-operative analgesia.

We aimed to assess the quality of analgesia, intra operative hemodynamic variations, side-effect profile, and the need for rescue analgesia in these patients in the early postoperative period of first 48 hours after surgery.

2. Materials and Methods

After obtaining Institutional Ethics Committee approval and written informed consent from the patients, this prospective study was conducted in MGM Medical College Navi Mumbai from January 2019 to September 2019. 40 patients of American Society of Anaesthesiologists (ASA) Class I E and II E, between 20 to 50 years of age undergoing emergency laparotomy for intestinal perforation were enrolled. Exclusion criteria included any contraindications to

epidural anaesthesia, allergy to local anaesthetic, cardiac disease, neurological disease, respiratory distress, hemodynamic instability. Preoperatively, two intravenous (i.v) access using wide bore cannulas were secured in all patients. Premedication was done with intravenous injection glycopyrrolate 0.004 mg/kg and injection midazolam 1mg. All non-invasive monitoring devices (non-invasive blood pressure, electrocardiograph [ECG] leads, pulse oximetry [SpO₂]) were attached, and the baseline parameters were noted. All cases of exploratory laparotomy were given general anaesthesia with standard protocol. After induction of anaesthesia and intubation the patient was positioned laterally, and epidural catheterization was done with 16G Touhy's needle at L2-L3 interspinous space using loss of air resistance technique. The epidural catheter was fixed at appropriate level. Then patients were given 8ml of 0.125% inj levobupivacaine slowly through the epidural catheter after negative aspiration of blood and cerebrospinal fluid.

Intraoperatively, patient's hemodynamic parameters like heart rate, mean arterial pressure (MAP), SpO₂, ECG, end-tidal CO₂ were monitored. Patients were then given test dose of 3ml 2% inj lignocaine with adrenaline through the epidural catheter. Intraoperatively the need for any additional analgesia like inj fentanyl was recorded. After the end of surgery patient was extubated and shifted to the post-operative recovery room.

Epidural top up was repeated 6 hourly for 48 hrs. During the study period, patient's heart rate, mean arterial pressure and VAS score were recorded at 1 hour interval after the drug administration. Side-effects such as nausea, vomiting, respiratory depression, motor blockade (Bromage scale >1),

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shivering were noted. All patients were assessed for the need of any post-operative rescue analgesia. The epidural catheter was removed after 48 hours.

3. Observations and Results

Intraoperatively patient was hemodynamically stable with no episodes of hypotension or bradycardia or tachycardia. The hemodynamic parameters were around the baseline readings.

The heart rate was maintained 100+/-20 beats per min with p value= >0.05 which was not significant.

MAP was also maintained around the baseline i.e 65+/-2mm hg with p value= >0.05.

None of the patients needed doses of intraoperative analgesia like inj Fentanyl.

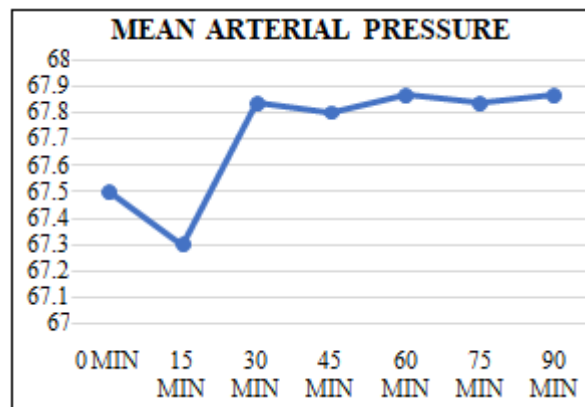


Figure 2: Intra operative

MAP monitoring)

Postop VAS

0 min	1
6th hour	2
12th hour	1
18th hour	2
24th hour	2
28th hour	1
34th hour	1
42nd hour	2
48th hour	1

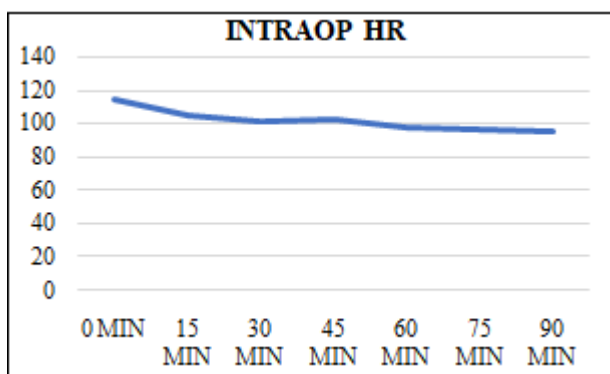


Figure 1: Intra operative HR Monitoring

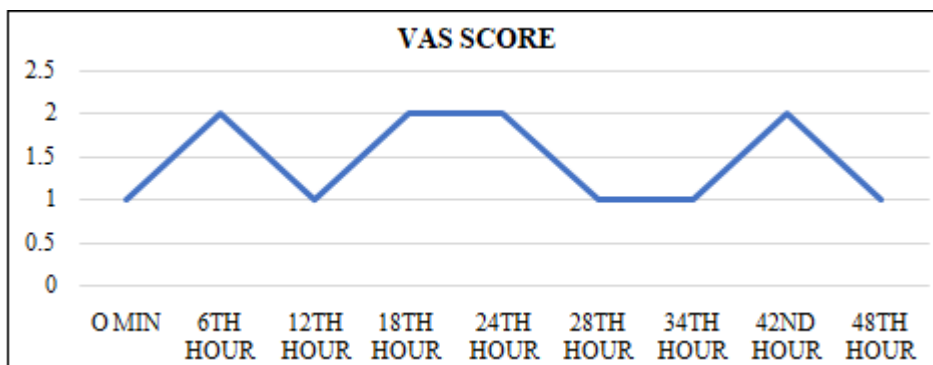


Figure 3: Graph showing postop Vas score monitoring

Post operatively patients had adequate pain relief and had lower VAS score up to 48 hours post-surgery. No requirement of any rescue analgesia was recorded throughout the post-operative period. No post-operative side effects like nausea, vomiting, pruritis, hypotension or respiratory depression were noted.

4. Discussion

Pain is often not treated effectively in many emergency laparotomies. Acute postoperative pain can cause various adverse effects on multiple organ systems such as cardiovascular stress, autonomic hyperactivity, increased metabolic rate, pulmonary dysfunction, fluid retention, dysfunction of the immune system, delayed return of bowel function, and further resulting in chronic pain syndromes^{1,4,5}.

Epidural analgesia can help in improving the quality of analgesia and provide opioid sparing effect. In our study we chose to investigate the analgesic efficacy of levobupivacaine 0.125% for intraoperative and postoperative analgesia.

HEMODYNAMICS

Heart Rate:

In this study, intraoperative heart rate was maintained around the baseline with no major fluctuations. There were no episodes of bradycardia/tachycardia or no hypotension noted in any of the patients. This is in agreement with the study done by Outta E Etta et al⁷, which recorded that patients with epidural anaesthesia had a stable intraoperative course.

Mean Arterial Pressure:

In our study the intraoperative MAP of the patients showed no significant difference. There were no episodes of hypo/hypertension recorded in any of the patients. A study done by Saravana Babu et al ⁸, showed the same result where the intraoperative MAP was maintained +/-20% around the baseline values.

VAS Score:

In our study, postoperative pain was assessed using VAS scoring. Epidural top up was given 6hourly using 0.125% inj levobupivacaine hydrochloride. We recorded lower VAS scores in all the patients upto 48 hours.

Complications

No complications such as hypotension/hypertension, brady/tachycardia, nausea/vomiting were noted in any of our patients. Intraoperative and post-operative period was uneventful. Outta E Etta et al ⁷ did a study in which 20% patients had hypotension. This was in regards with inj Lignocaine which was not seen in our study with levobupivacaine.

5. Conclusion

It can be concluded from the study, that epidural injection of levobupivacaine hydrochloride 0.125% is effective for hemodynamic stability and for postoperative analgesia during the immediate postoperative period up to 48 hours with no complications.

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