



Early Extubation is Enhanced in Patients Receiving Local Infiltration over the Opioid Based Anaesthesia in Cardiac Surgery Patients

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Abstract

Objective: To study the comparative effect of local anaesthetic infiltration and systemic opioid analgesia on the early extubation in cardiac surgeries.

Introduction: Sternotomy inflicts severe surgical trauma and affects the pulmonary functions and the subsequent recovery. Various modalities have been employed to alleviate the implications of pain. Local infiltration of anaesthetics has been documented with good results.

Material and Methods: Eighty (80) patients in the age group of 18 to 50 years planned for open heart surgeries were divided into two groups A and B of forty (40) patients each. Group A patients received infusion of fentanyl @ 1mcg/kg/hr while as in group B 20ml of 0.5% Ropivacaine was given subcutaneously at sternotomy site. In addition, in group A, 50 mcg bolus of fentanyl was given at the time of sternotomy while as group B patients received 10 ml bolus of 0.2% Ropivacaine.

After completion of surgery patients were shifted to Cardiac ICU and were observed for early awakening and extubation.

Results: 85% of group B patients were extubated within 2 hours after surgery. The mean time duration of post operative ventilation in group B patients was 1.7 hours. In contrast 32.5% of patients of the Group A could be extubated within 2 hours. The mean duration of postoperative ventilation in group B was 5.2 hours. Furthermore the group B patients had a better post operative pain control and breathing pattern than the group A patients.

None of the patients of the either group was re-intubated.

Conclusion: Infiltration of surgical wounds with local anaesthetics improves pain scores and reduces opioid consumption and facilitates early extubation and improvement of post extubation breathing and blood gas parameters.

Keywords: Cardiac Surgery, Local infiltration, systemic opioid anaesthesia, effects, recovery.

Introduction

Cardiac surgery induces considerable pain and impairment in pulmonary functions and increases morbidity and mortality. Standardisation of cardiac

anaesthesia has greatly evolved over the last decade; therefore, evaluation of the evidence is needed to assess the comparative benefits of different techniques of pain management, to guide clinical practice and to identify areas of further research.^[1]

Sternotomy inflicts severe surgical trauma and affects the pulmonary functions and the subsequent recovery. Various modalities have been employed to alleviate the implications of pain. Local infiltration of anaesthetics has been documented with good results.^[2]

Patients' pain relief by parasternal single injection of Bupivacaine in early postoperative period can facilitate earlier ventilator weaning and tracheal extubation after open heart surgery as well as achieving lower pain scores and narcotic requirements.^[3] The use of large doses of opioid analgesics to treat pain after cardiac surgery can prolong the time to tracheal extubation and interfere with recovery of bowel and bladder function in the postoperative period.^[4] Wound infusion and patient-controlled analgesia are superior to patient-controlled analgesia alone in reducing pain at 1, 3, and 90 days after cardiac surgeries.^[5]

We studied the comparative efficacy and applied practical benefits of local anaesthetic infiltration and systemic opioid administration in cardiac surgery patients and tried to find out the related outcomes.

Material and Methods

A total of eighty (80) patients were divided into two groups A and B of forty(40) patients each. Patients discussed and planned for open heart surgeries in the age group of 18 to 50 years of ASA 1-4 were included. Following patients were excluded;

Refusal to surgery

Allergic episodes to local anaesthetics or opioid

Opioid addiction and low mental capability

Previous cardiothoracic surgery

Respiratory diseases

All study patients were administered pre-anesthetic medication with Ranitidine and Domperidone and were kept NPO for 8 hours prior to surgery. Antibiotic was given half an hour before shifting to OR. After establishing IV access, induction was done by Midazolam (5 mg), Vecuronium (1 mg/kg) and Fentanyl (200 mcg).

In one group (group A) infusion of fentanyl was given@1mcg/kg/hr while as in group B 20ml of 0.5% Ropivacaine was given subcutaneously on

sternotomy site. In addition, in group A, 50 mcg bolus of fentanyl was given at the time of sternotomy while as group B patients received 10 ml bolus of 0.2% Ropivacaine.

After completion of surgery patients were shifted to Cardiac ICCU and were observed for early awakening and extubation.

Results

34 out of 40 (85%) group B patients were extubated within 2 hours in cardiac ICCU after surgery. 3 (7.5%) patients were extubated within 5 hours and remaining 1 patient needed overnight intubation and gradual weaning from mechanical ventilation. The mean time duration of post operative ventilation in group B patients was 1.7 hours. Compared to this, only 13 out of 40 (32.5%) patients of the Group A could be extubated within 2 hours while as the remaining 27 (67.5%) patients were extubated after 5 hours. The mean duration of postoperative ventilation in group B was 5.2 hours.

Furthermore the group B patients had a better post operative pain control and breathing pattern than the group A patients.

None of the patients of the either group was re-intubated.

Discussion

A parasternal intercostal block is a safe, simple, and effective adjunct for optimizing of pain control and reducing opioid analgesics after adult cardiac surgery. This practice helps clinicians with an effective treatment for sternal wound pain.^[6]

Early tracheal extubation after cardiac surgery has become more popular and it can be safe and result in decreased cost and improved outcome.^[7]

Median sternotomy incision and the mediastinal tube insertion site are main sources of pain in cardiac surgical patients^[8]

Therefore, infiltration of local anesthetic agents near the sternotomy wound is a possible way of diminishing early postoperative pain. This method may reduce opioid requirements, and subsequent opioid induced side effects such as sedation and respiratory depression.^[9] One of the most important

parameters in rapid weaning of cardiac surgery patients from ventilator is control and reduction of pain in early postoperative period. Reduction of pain can lead to reduction of intubation time and narcotic requirements and improvement of ABG parameters in early postoperative period.^[8,9]

Conclusions

Infiltration of the surgical wounds with local anaesthetics has been shown to improve pain scores or reduce opioid consumption after various types of major cardiac surgery. This has facilitated the early extubation and post-extubation improvement in breathing and blood gas parameters.

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