

Evaluation of Pre Incision Infiltration of A Local Anesthetics Regimen Prior to Modified Radical Mastectomy: A Randomized Single Blinded Study

Anshu Priyanka Lakra¹, Ranjita Aske²

¹Senior Resident, Department of Anesthesia, Gandhi Medical College, Bhopal, Madhya Pradesh 462001, India, ²Associate Professor, Department of Anesthesia, Government Medical College, Ratlam, Madhya Pradesh 457001, India.

Abstract

Introduction: Breast surgery can be emotionally distressing and physically painful. Although regional anesthesia and nerve block techniques are widely used in many situations, many anesthetists are still minded by the simplest way of wound infiltration. Preemptive analgesia is the concept of providing analgesia before surgical incision. Suggested advantages of this technique include a reduction in postoperative pain, analgesic consumption and an improvement in patient satisfaction. In addition adverse effect of opioids consumption such as postoperative nausea and vomiting, drowsiness and risk of respiratory depression can be minimized. **Aims & Objective:** To evaluate the efficacy of preincision mastectomy flap infiltration with a cocktail of bupivacaine 0.5% and lignocaine with adrenaline over intraoperative and postoperative analgesic requirement compared with patients receiving placebo. To investigate the efficacy of preincision local anesthetic regimen infiltration in postoperative pain score in modified radical mastectomy compared with patients receiving placebo. To study their effect on hemodynamic parameters, any side effects and complication. **Material and method:** In this randomized single blinded study, 60 patients of ASA grade I and II posted for modified radical mastectomy were randomized into group I and group II. Group I receive pre incision infiltration of mastectomy flap with cocktail of 10 ml bupivacaine (0.5%)+10 ml of lignocaine 2% with adrenaline, Group II receive pre incision infiltration with 20 ml normal saline. All patients undergo standardized general anaesthesia. We assessed intraoperative requirement of analgesic drugs, haemodynamic parameters, postoperative supplementary analgesia, VAS score and side effects. **Results:** There was no statistical difference between both groups regarding the demographic data. The mean blood pressure, pulse rate was less in group I which was statically significant. The mean supplementary analgesic requirement was significantly less in group I. The postoperative VAS score was significantly less in study group. **Conclusion:** Preemptive local anaesthetic infiltration at the incision site is safe and effective method for reducing postoperative pain and stress response with a significant reduction of analgesic requirement.

Keywords: preemptive analgesia; mastectomy; bupivacaine; lignocaine; preincision infiltration

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Corresponding Author: Ranjita Aske, Associate Professor, Department of Anesthesia, Government Medical College, Ratlam, Madhya Pradesh 457001, India.

E-mail: dr.ranjitaaske1980@gmail.com

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Introduction

Breast surgery can be emotionally distressing and physically painful. Most patients may further evolve into post mastectomy chronic pain syndrome [1,2]. Tissue damage resulting from surgery causes in the first phase, a nociceptive stimulation in the CNS and in the second phase, a transient inflammatory reaction [3,4].

Preemptive analgesia is one of the method of pain management used in the perioperative period. The preemptive analgesia strategy originated in early 1980 [5]. Preemptive analgesia has been shown to have a beneficial analgesic effect in a large number of surgical procedures including laparoscopy, hernia, amputation, spinal and orthopedics surgeries [6,7].

It is very important to mention that wound infiltration with long standing local anesthetics decreases the anesthetic and analgesic doses during surgery. The addition of adrenaline to the local anesthetic prolongs its duration of action. It decrease its systemic absorption thus decreasing its toxicity [8].

The aim of this study is evaluating the efficacy of preincision infiltration in the area of planned surgical incision in the patient undergoing modified radical mastectomy with a cocktail of bupivacaine 0.5% and lignocaine with adrenaline over intraoperative and postoperative analgesic requirement and pain score compared with patients receiving placebo.

Materials and Methods

The study was designed as a prospective, randomized, single blinded study. After taking approval from ethics committee 60 patients of age group 20 to 60 years with ASA grade I and II posted for modified radical mastectomy under general anesthesia were assigned with informed consent into two groups (n=30).

Group I (n=30) received preincision infiltration with mixture of 10 ml of bupivacaine (0.5%)+ 10 ml of lignocaine with adrenaline and group II (n=30) received 20 ml of normal saline. Patients with history of any associated systemic disease, patient refusal, local anesthetic sensitivity were excluded from this study. All patient underwent thorough pre anesthetic checkup and were explained about the visual analogue scale. (0-10) scoring system for pain. The multichannel monitor were applied to the patient on arrival to the operating room. A suitable peripheral vein was cannulated and IV ringer lactate solution was started to all patients before the procedure.

Baseline blood pressure, pulse rate, oxygen saturation was recorded. A standard anesthetic technique was adopted. IV glycopyrolate 0.2 mg, IV midazolam 1mg, IV fentanyl 2 ug/kg were given for premedication. General anesthesia was induced with propofol 2 mg/kg and succinyl choline 2 mg/kg to facilitate tracheal intubation. After intubation the preparation of local anesthetic was infiltrate along the intended incision line then 15 minute later the operation began. Loading dose of IV atracurium 0.5 mg/kg was given then further bolus doses of 0.1 mg/kg was used as during intermittent positive pressure ventilation. Anesthesia was maintained with oxygen, nitrous oxide and sevoflurane. Fentanyl was used for analgesia. Neuromuscular block reversed with 0.5 mg glycopyrolate and 2.5 mg neostigmine. Extubation was done and then patient was shifted to recovery room.

Hemodynamic monitoring, requirement of anesthetic drugs were recorded intraoperatively every 15 min till extubation. In postoperative period hemodynamic monitoring, VAS score for pain assessment, requiremet of supplementary analgesia and side effects were recorded every hr till 6 hr. Any patient expressing VAS score >4 was given iv diclofenac.

Results

Sixty patients were taken up for the study, thirty in group I (receive preincision infiltration of 20 ml 0.5% bupivacaine + lignocaine with adrenaline) and thirty in group II (pre incision infiltration of 20 ml normal saline). demographic data such as age, weight and duration of surgery did not vary significantly between two groups [Table 1]. Regarding hemodynamic parameters the mean SpO₂ (group I =98.28) (group II=98.14) (p value=0.188) the difference in mean (\pm SD) was found to be statistically insignificant (p>0.05) between two Groups [Figure 1].

The mean pulse rate (group I = 88.10) (group II=88.50) (p value=0.045) which was statistically significantly less in group I [Figure 2].

The mean systolic (group I=127.79) (group II=132.12) (p value=0.0039) and mean diastolic blood pressure (group I=81.09) (group II=84.04) (p value=0.001) were significantly less in group I [Figure 3].

Post operatively, the pain experienced was evaluated by visual analogue scale (0-10) at different time interval following surgery. Pain score were significantly less (p=0.002) in group I

when compared with Group II [Figure 4]. The need of supplementary analgesia intraoperatively and postoperatively was significantly less in group I [Figure 2].

Discussion

Pain is inevitably associated with any surgical procedure, having first the form of acute & later chronic disturbances. Pain sensation depends on the degree of surgical trauma, previous pain experience of the patient. The concept of preemptive analgesia is the application of local anaesthetic drugs by regional nerve blockade, infiltration of surgical wound or by topical instillation into the operative bed before tissue trauma. Thus, preventing the noxious stimuli that result from the tissue damage. Many studies reported that the preemptive analgesia is more effective than post operative infiltration [12] & preincision mastectomy flap infiltration with bupivacaine adrenaline solution is a safe and effective for reduction of post mastectomy pain, stress response with a significant reduction of the analgesic requirement [13].

Many trial demonstrate a significant reduction of the opioid requirement in mastectomy after local bupivacaine infiltration [14]. However the intra operative and postoperative assessment of the stress response in the form of pulse rate, blood pressure and respiratory rate is an important parameter to be assessed in any painful surgical maneuver. A significant reduction of the VAS score and opioids consumption was reported by several studies [15].

As per the present study postoperative VAS score was significantly reduced [Figure 4]. All parameters of the stress response were reduced in the study group with a significant p value. The same was noticed in the dose of intraoperative and postoperative analgesic consumption.

In our study we concluded that Preemptive analgesia application in the form of skin infiltration in the area of planned surgical incisions with 10 ml 0.5% Bupivacaine and 10 ml lignocaine + adrenaline in patients undergoing modified radical mastectomy decreases postoperative pain, limits the amount of fentanyl used during surgery, reduces the demand for supplementary analgesia in post operative period and provide hemodynamic stability.

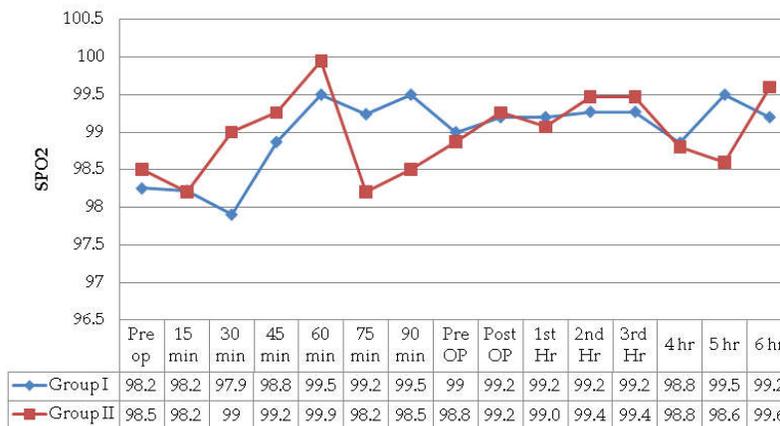


Fig. 1: Showing mean SpO₂ of patient in both the groups

Table 1: Requirement for supplemental analgesia in patients receiving pre emptive infiltration of local anesthetic regimen (group I) or saline (group II). Values are number (proportion). Group I require significantly less supplementary analgesia as compared to Group II

| Supplemental analgesia | Intraop | |
|------------------------|----------|----------|
| | Group I | Group II |
| None | 24 (80%) | 12 (40%) |
| 1 st Dose | 4 (13%) | 13 (43%) |
| 2 nd Dose | 2 (7%) | 5 (16%) |
| 3 rd Dose | 0 | 0 |
| | Post op | |
| None | 22 (73%) | 6 (20%) |
| 1 st Dose | 5 (16%) | 14 (46%) |
| 2 nd Dose | 2 (7%) | 7 (24%) |
| 3 rd Dose | 1 (3%) | 3 (10%) |

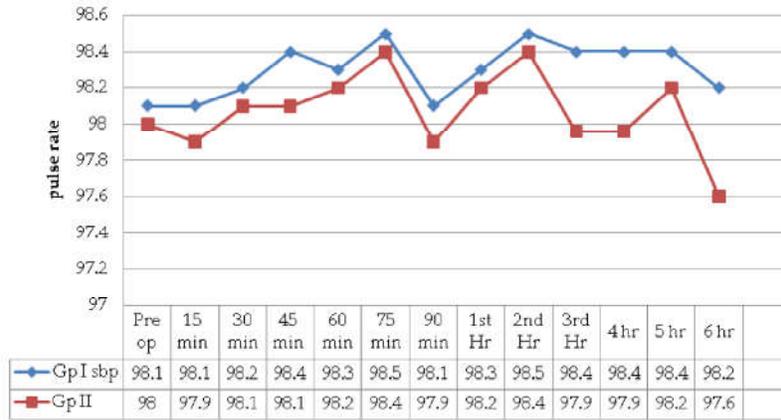


Fig. 2: Showing Comparison of heart rate (beat/min) of the two study group. There were no significant difference in the heart rate between group I and II

Comparison of mean systolic and diastolic blood pressure at different time interval

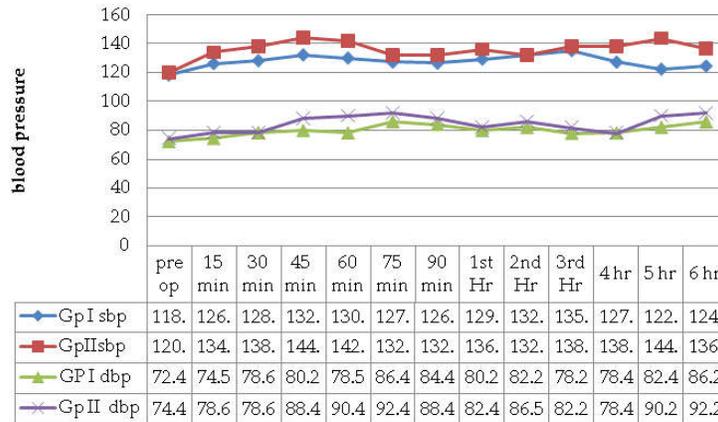


Fig. 3: Figure Showing Comparison of systolic and diastolic BP between two study groups

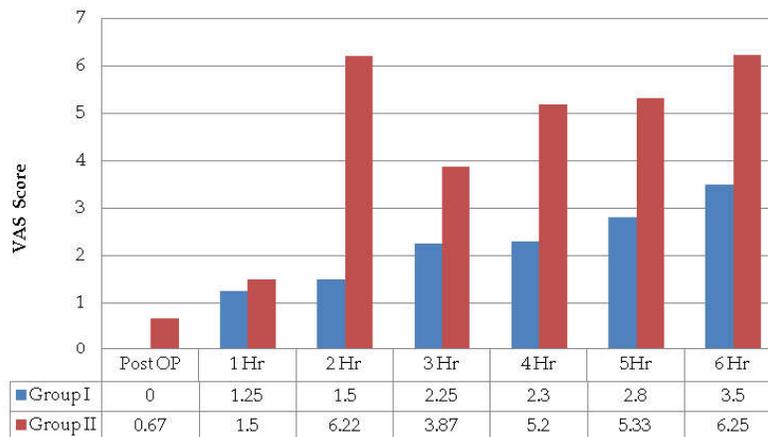


Fig. 4: The VAS score chart shows that group I (local anesthetic regimen) has lower VAS score than Group II (Placebo). This was statistically significant with p value of 0.042

Conclusion

In our study we concluded that Preemptive analgesia application in the form of skin infiltration in the area of planned surgical incisions with 10 ml 0.5% Bupivacaine and 10 ml lignocaine + adrenaline in patients undergoing modified radical mastectomy decreases postoperative pain, limits the amount of fentanyl used during surgery, reduces the demand for supplementary analgesia in post operative period and provide hemodynamic stability.

Key Messages

Preemptive local anesthetic infiltration at the incision site with 10 ml 0.5% bupivacaine and 10 ml lignocaine + adrenaline is safe and effective method for reducing postoperative pain and stress response, with a significant reduction of analgesic requirement during surgery and in the postoperative period.

Conflict of Interest: none

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