e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2024; 16(2); 236-240

Original Research Article

Evaluation of PEC- I and PEC-II Block with or Without Clonidine for Post-Operative Analgesia in Benign Breast Lesions

Preeti Lakra[1], Vikas Kumar Gupta[2], Jyotsna Kubre[3], Aditi Mishra[4], RP Kaushal[5]

[1]Junior Resident, Department of Anaesthesiology, Gandhi Medical College, Bhopal, M.P
[2]Associate Professor, Department of Anaesthesiology, Gandhi Medical College, Bhopal, M.P
[3]Assistant Professor, Department of Anaesthesiology, Gandhi Medical College, Bhopal, M.P
[4]Junior Resident, Department of Anaesthesiology, Gandhi Medical College, Bhopal, M.P
[5]Professor and HOD, Department of Anaesthesiology, Gandhi Medical College, Bhopal, M.P

Received: 29-11-2023 / Revised: 05-01-2024 / Accepted: 29-01-2024
Corresponding Author: Dr. Aditi Mishra
Conflict of interest: Nil

Abstract:

Background: The PEC-I and PEC-II blocks entail the administration of a Local anaesthetic Solution into the space between the Pectoralis Major and Pectoralis Minor muscles, and the space between Pectoralis Minor and serratus anterior, with the purpose of blocking the medial and lateral Pectoral Nerves. Using only local anaesthetic results in a relatively brief duration of postoperative analgesia. Therefore, diverse adjuvants have been employed to enhance the quality and prolong the duration of analgesia. In our investigation, clonidine was utilized as an adjuvant.

Aims and Objectives: The primary objective of our study is to assess the efficacy of PEC-I and PEC-II blocks with or without clonidine for postoperative analgesia in cases of benign breast lesions and secondary objectives encompass the assessment of postoperative pain scores and the time until the administration of the initial analgesic.

Materials and Methods: The interventional type of study was carried out on 60 patients in the department of Anaesthesiology at Gandhi medical college Bhopal after the approval of institutional ethics committee of our hospital. Patients were assigned into 2 groups : Group C -30 Patients received 30ml of 0-25% Bupivacaine, 10 ml PEC- I and Bupivacaine 0-25% 20ml PECS-II with clonidine 0.2ml (30mcg) and Group P -30 patients received 30ml of 0.25% Bupivacaine, 10 ml PEC-I and Bupivacaine 0.25% 20ml PECS – II without Clonidine. Post operatively, pain was evaluated by NRS Scale for pain at 0,2,4,6,8,10,12 and 24 hours. Slow IV Tramadol 0.5mg/kg was used as the first Rescue analgesic whenever NRS Scale more than 3 or if the Patient demanded analgesia. Time of first rescue analgesia was noted down.

Result: In this study, we found that pec block with bupivacaine & clonidine has better post-operative pain relief and longer duration of pain relief. It has late requirement of first rescue analgesia. Evaluating postoperative pain was our primary outcome. In this study, we observed that first rescue analgesia or duration of analgesia was more in patients who received PEC block with bupivacaine & clonidine being (445.33 ± 22.2) than patients who received PEC block with bupivacaine (366.67 ± 50.3) which was statistically highly significant ($p< 0.001$). The NRS scores among the patients who received PEC block with Bupivacaine & Clonidine were significantly lower than that of patients who received PEC Block with Bupivacaine during all the intervals of time.($p<0.001$). PEC Block with bupivacaine and Clonidine (GROUP C) showed lower NRS scores at most of the time interval.

Conclusion: This study has clarified that employing an ultrasound-guided PEC block, combined with Clonidine as an adjuvant alongside 0.25% bupivacaine, results in superior postoperative analgesia compared to using 0.25% bupivacaine alone. The inclusion of clonidine (30 mcg) in the PEC block with 0.25% bupivacaine demonstrates effective postoperative pain control, as evidenced by lower Numeric Rating Scale (NRS) scores, in contrast to utilizing 0.25% bupivacaine alone for pectoral nerve block in patients undergoing excision of benign breast lesions. Furthermore, the addition of Clonidine (30 mcg) significantly extends the duration of postoperative analgesia.

Keywords: PEC block, ultrasound, Fibroadenoma, bupivacaine, clonidine

Introduction

A fibroadenoma is a painless, one-sided, non-malignant (non-cancerous) mass in the breast, characterized by a solid structure rather than being filled with fluid. This type of tumour is most frequently encountered in females aged 14 to 35, although it can manifest at any point in a person's life. Among women, benign breast lesions such as fibroadenomas are prevalent. When these lesions

display symptoms, both patients and healthcare providers often choose definitive surgical intervention. Despite the adoption of minimally invasive techniques in breast surgery, acute postoperative pain remains a significant factor contributing to prolonged hospital stays and potential dissatisfaction among patients. [1] Various investigations indicate a wide-ranging occurrence of postoperative pain, with rates ranging from 12% to 57% following breast cancer surgery, and 21% to 50% following noncancerous breast surgeries. [2] As a result, there is a distinct inclination toward a straightforward yet efficient analgesic approach to mitigate postoperative discomfort.

Numerous medical facilities choose general anaesthesia or sedation along with local anaesthetic (LA) infiltration for superficial breast surgeries. Unfortunately, these methods provide only limited pain relief for a short duration following the surgical procedure.

Regional anaesthesia techniques, including thoracic epidural block, thoracic paravertebral block (TPVB), and intercostal nerve block, have been employed for anaesthesia and/or analgesia in breast surgery. Nevertheless, these invasive regional approaches come with certain complications during the perioperative period, rendering them unsuitable for day-stay procedures. Additionally, the hesitancy among many anaesthesiologists to utilize invasive techniques in breast surgery further limits the widespread adoption of these methods. [3]

A viable alternative in this context is the pectoral nerve (PEC) block, a secure peripheral nerve block technique capable of delivering sustained analgesia both throughout and subsequent to breast surgery. [4] The Pecs block is a newer regional anaesthetic that can provide analgesia for chest wall surgery, potentially avoiding more invasive procedures such as paravertebral blockade. Pecs blocks have been used by anaesthesiologists to provide analgesia for many procedures ranging from port placement to radical mastectomies since analgesics enter deeper planes. [5]

Senapathi TG et al concluded through their study that the combination of ultrasound-guided Pecs II block and general anaesthesia proves effective in mitigating both intra- and postoperative pain in individuals undergoing modified radical mastectomy. The ultrasound-guided Pecs II block is a peripheral nerve block that was relatively safer option in its application. [6] Unadorned local anaesthetics offer only transient postoperative pain relief, and catheter insertion may not be a practical solution, particularly given that most of these surgeries are conducted on a day-care basis. Consequently, there has been significant interest in augmenting local anaesthetics with adjuncts like clonidine, epinephrine, dexamethasone, tramadol, and midazolam. This aims to extend the duration and enhance the quality of analgesia, ultimately leading to improved postoperative pain relief. [7] However, in this study, Clonidine has been evaluated as an adjuvant for postoperative pain relief in pecs block.

Clonidine prolongs the action of local anaesthetics in peripheral nerve blocks. This effect of clonidine could be mediated directly at the peripheral nerve because the drug inhibits impulse conduction in primary afferents and especially in C fibres. [8,9]

Clonidine improves the duration of analgesia and anaesthesia when used as an adjunct to intermediate-acting (but not long-acting) local anaesthetics for single injection peripheral nerve block techniques. Additionally, side effects such as sedation and hypotension appear to be limited at doses up to 150 µg. [10] Present study was performed to evaluate PEC-I and PEC -II block with or without clonidine for postoperative analgesia in benign breast lesions and to evaluate pain score post-operatively, time of requirement for first analgesia and occurrence of side effects and complications related to use of clonidine.

Materials and Methods:

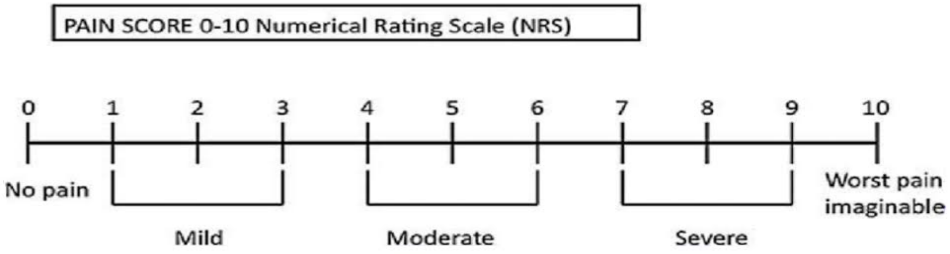
Inclusion Criteria	**Exclusion Criteria**
ASA Grade I and II	Patients Refusal
Age between 18 – 60 years	ASA Grade III and more
Patient undergoing excision of Benign Breast Lesions under GA	Cardiac disease, Respiratory distress, Psychiatric disorders, Uncontrolled Hypertension or diabetes mellitus
	Pregnancy
	Drug allergy
	Coagulation disorders

An observational type of study was carried out on 60 patients in the Department of Anaesthesiology at Gandhi medical college Bhopal Madhya Pradesh. After the approval of institutional ethics committee of our hospital, Patients were assigned into 2 groups : Group C consisted of 30 Patients who received 30 ml of 0.25% Bupivacaine, 10 ml for PEC- I block and Bupivacaine 0.25% 20 ml for PECS-II with clonidine 0.2ml (30mcg) and Group P consisted of 30 patients who received 30ml of 0.25% Bupivacaine, 10 ml in PEC-I and Bupivacaine 0.25% 20ml in PECS – II without Clonidine. Post operatively,

pain was evaluated by NRS Scale for pain at 0, 2, 4, 6, 8, 10, 12 and 24 hours. Slow IV Tramadol 0.5mg/kg was used as the first Rescue analgesic whenever NRS Scale was more than 3 or if the Patient demanded analgesia. Time of first rescue analgesia was noted down. Furthermore, side effects and its complications related to use of clonidine were also noted.

Pain Assessment Tool: Numerical Rating Scale

The Numerical Rating Scale has shown a high correlation as compared to other pain-assessment tools. The patients were asked to circle the number between 0 and 10, zero representing "no pain at all" whereas the upper limit represents "the worst pain possible"



Statistical Analysis

Data was entered in Microsoft excel software SPSS version 27 was used for performing the statistical analysis. In both groups the continues variables Such as age, SBP, DBP, HR, NRS Scores, First rescue analgesia are expressed as mean and standard division. Continues variable were compared among both groups Using independent T- Test While category variables were compared using Chi-square test or Fischer's Test depending on the distribution. All statistical tests were performed with the confidence level of 95% and power off 80% for all the statistical interpretations p value less than 0.05 was considered as significant.

Results

Table 1: Comparing mean age between groups

	Group	N	Mean and SD
Age (years)	Group P	30	50.10 ± 4.856
	Group C	30	50.63 ±4.694

Unpaired T-Test applied. P value<0.05 was taken statistically significant.

Table 2: ASA grade distribution

ASA Grade	Frequency	Percent
ASA Grade I	33	55%
ASA Grade II	28	45%

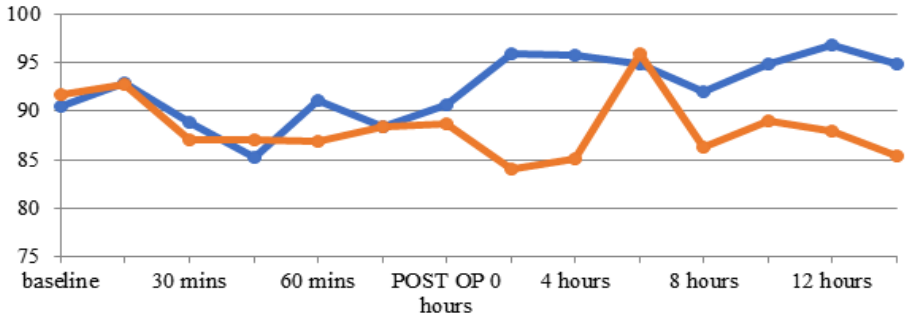


Figure 1: Showing Mean Heart Rate of both Group P and Group C.

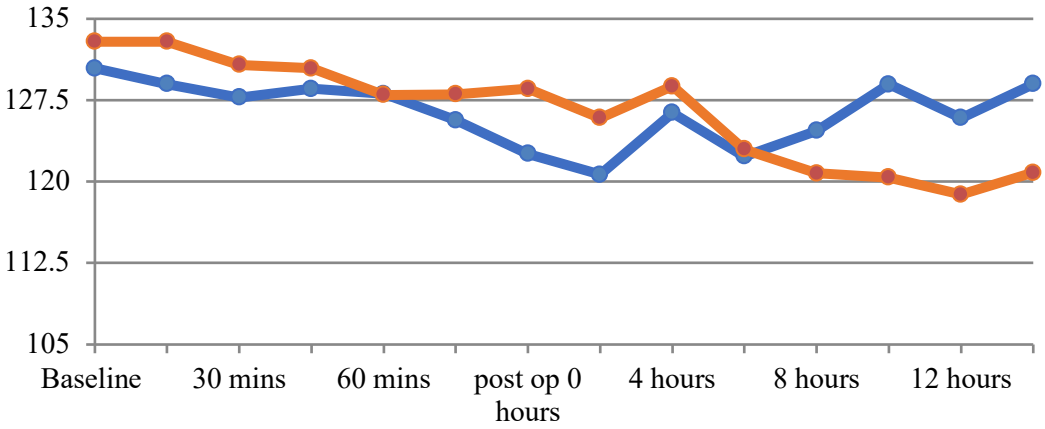


Figure 2: Showing Mean systolic Blood Pressure of both Groups P and C. Unpaired T-test was used. P value was statistically insignificant.

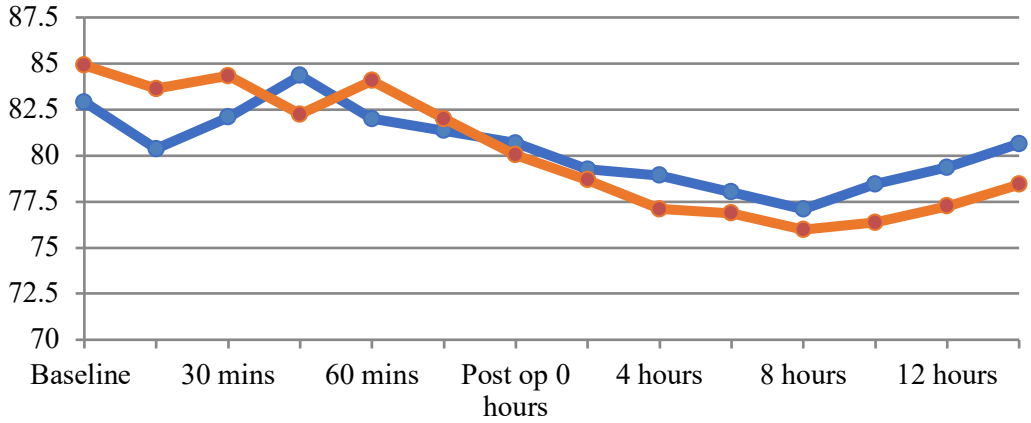


Figure 3: Showing Mean Diastolic Blood Pressure in Both Groups P and C.

Table 3: Comparison of NRS scores at different time intervals

Time Points	Group P	Group C	P-Value
0 Hours	0	0	0
2 Hours	0	0	0
4 Hours	4.50±0.682	0	<0.001
6 Hours	1.60±0.621	4.57±0.817	<0.001
8 Hours	1.83±0.699	0.70±0.877	<0.001
10 Hours	1.40±1.223	1.20±0.665	<0.001
12 Hours	4.70±1.149	1.70±0.523	<0.001
24 Hours	4.67±0.987	1.13±1.223	<0.001

Data is expressed as mean and SD

Table 4: Mean time required for first rescue analgesia

Group	N	Mean And SD	P-Value
Group P	30	366.67± 50.3 (6 Hours)	<0.001
Group C	30	445.33±22.2 (7.5 Hours)	

Discussion and Conclusion

There was no difference in age distribution in both the groups and was statistically insignificant. Comparison of Mean Heart Rate, mean systolic and diastolic blood pressure of both Group P and Group C was statistically insignificant as well. The NRS scores among the GROUP C were significantly lower than that of GROUP P during all the intervals of time ($p<0.001$). PEC Block with bupivacaine and Clonidine (GROUP C) showed lower NRS scores at most of the time interval. Total analgesic consumption in the PEC BLOCK with Group C was lower compared to that of Group P which was significant statistically ($p<0.001$). No significant side effects or complications occurred while using clonidine in Group C patients at any point of time.

This study elucidated that PEC block performed by USG-guidance using Clonidine as an adjuvant with 0.25% bupivacaine could account for better analgesia postoperatively than 0.25% bupivacaine alone. PEC block with 0.25% bupivacaine + clonidine 30 mcg good post- operative pain control in terms of low NRS scores as compared to 0.25% bupivacaine alone in pectoral nerve block in patients undergoing Benign Breast Lesions excision. Clonidine 30mcg also significantly prolongs the duration of postoperative analgesia. Side effects due to usage of local anaesthetics and adjuvants were nil.

Our results were similar to study conducted by Colin J.L McCartney et al. [11] Dose of Clonidine varied from 30-300mcg. Overall 15 studies supported use of adjuvants for peripheral nerve blocks.

Another study conducted by Ajay Prasad Hrishi et al. [**12]** Based on this study, inclusion of 100mcg clonidine with bupivacaine in USG supraclavicular block prolongs both sensory and motor blockade providing significant postoperative analgesia and mild sedation.

References

1. Ramala SR Jr, Chandak S, Chandak MS, Annareddy S. A Comprehensive Review of Breast Fibroadenoma: Correlating Clinical and Pathological Findings. Cureus. 2023 Dec 5;15 (12):e49948.
2. J. Ghadimi, D., Looha, M.A., Akbari, M.E. et al. Predictors of postoperative pain six months after breast surgery. Sci Rep. 2023; 13: 8302.
3. Moon EJ, Kim SB, Chung JY, Song JY, Yi JW. Pectoral nerve block (Pecs block) with sedation for breast conserving surgery without general anesthesia. Ann Surg Treat Res. 2017 Sep;93(3):166-169.
4. Moon EJ, Kim SB, Chung JY, Song JY, Yi JW. Pectoral nerve block (Pecs block) with sedation for breast conserving surgery without general anesthesia. Ann Surg Treat Res. 2017 Sep;93(3):166-169.
5. Battista C, Krishnan S. Pectoralis Nerve Block. [Updated 2023 Jul 25]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https:// www.ncbi.nlm.nih.gov/books/NBK547691/
6. Senapathi TGA, Widnyana IMG, Aribawa IGNM, Jaya AAGPS, Junaedi IMD. Combined ultrasound-guided Pecs II block and general anesthesia are effective for reducing pain from modified radical mastectomy. J Pain Res. 2019 Apr 26; 12:1353-1358.
7. Brummett CM, Williams BA. Additives to local anesthetics for peripheral nerve blockade. Int Anesthesiol Clin. 2011 Fall;49(4):104-16.
8. Butterworth JF, Strichartz GR. The 2-adrenergic agonist clonidine and guanfacine produce tonic and phasic block of conduction in rat sciatic nerve fibers. Anesth Analg 1993; 76: 295–301.
9. Gaumann DM, Brunet PC, Jirounek P. Clonidine enhances the effects of lidocaine on C-fiber action potential. Anesth Analg 1992; 74:719–25.
10. Hrishi AP, Rao G, Lionel KR. Efficacy of Clonidine as an Additive on the Duration of Action of Brachial Plexus Block Performed Under Ultrasound and Nerve Locator Guidance: A Prospective Randomized Study. Anesth Essays Res. 2019 Jan-Mar;13(1):105-110.
11. McCartney CJ, Duggan E, Apatu E. Should we add clonidine to local anesthetic for peripheral nerve blockade? A qualitative systematic review of the literature. Reg Anesth Pain Med. 2007 Jul-Aug;32(4):330-8.
12. Hrishi AP, Rao G, Lionel KR. Efficacy of Clonidine as an Additive on the Duration of Action of Brachial Plexus Block Performed Under Ultrasound and Nerve Locator Guidance: A Prospective Randomized Study. Anesth Essays Res. 2019 Jan-Mar;13(1):105-110.