

Preincision Vs Postincision Ropivacaine Wound Infiltration in Patients Undergoing Elective Laparotomy

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Abstract: Postoperative pain control is an important aspect of perioperative care. The aim of our study was to compare the efficacy of preincision and postincision wound infiltration with ropivacaine in reducing postoperative pain and analgesic requirement in patients undergoing elective laparotomy. Hundred patients of ASA I and II scheduled for elective laparotomy were divided into two groups A and B. Group A received 0.25-0.5ml/kgwt of 0.25% of ropivacaine 15 minutes before giving incision and group B received same drug and dose at the wound site after completion of surgery. VAS scores and analgesic requirement for 24 hours was recorded in both the groups. It was observed that patients in group A had significantly lower VAS scores (p value of 0.003) and tramadol consumption (p value of 0.001) as compared to group B patients. Hence it can be concluded from our study that local infiltration with ropivacaine before incision is better than given postincision in terms of pain relief and total analgesic requirement.

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I. Introduction

Preemptive analgesia is defined as an antinociceptive treatment that prevents the establishment of altered central processing of afferent input which amplifies postoperative pain¹. Several drugs have been used for preemptive analgesia like paracetamol, gabapentin, morphine, local anaesthetics like bupivacaine, ropivacaine, etc. Several studies have concluded that preemptive analgesia is effective as such^{2,3}. Management of postoperative pain is a major concern for anaesthetists in patients undergoing laparotomies. Besides parenteral drugs that are being used for postoperative analgesia local infiltration is an effective way of relieving postoperative pain in patients undergoing laparotomies. Our present study aims to compare the analgesic efficacy of preincisional with postincisional ropivacaine in patients undergoing elective laparotomies.

II. Material And Methods

This study was conducted in the department of Anaesthesiology and critical care GMC Srinagar. 100 patients of ASA I and II in the age group of 18-60 years of both sexes, who were scheduled for elective laparotomy were randomly assigned in two groups A and B. On the evening before surgery patients were clinically evaluated and instructed about the evaluation of pain using visual analogue scale (VAS) of 0-10cm (0-no pain and 10-worse pain). No pre-emptive analgesia was given to the patients. The anaesthesia technique was standardised. Patients were induced with inj. propofol 2mg/kgwt and inj. fentanyl 2µg/kgwt. Tracheal intubation was facilitated using inj. atropium 0.5g/kgwt. Anaesthesia was maintained with 1% isoflurane and 60% nitrous oxide in oxygen. Patients were monitored using ECG, BP, SPO2 and ETCO2 monitors. Total duration of surgery was also recorded. After induction of anaesthesia patients were properly draped and inj. ropivacaine 0.25% in a dose of 0.25-0.5ml/kgwt was infiltrated prior to skin incision in group A and in group B same dose of ropivacaine was given at the end of surgery. After extubation patients were shifted to postanaesthesia care unit. Pain assessment was done using VAS scores postoperatively at 1, 2, 6, 12, 18 and 24 hours. Total tramadol consumption/24hrs was also recorded in both the groups.

III. Results

In our study, there was no statistically significant difference regarding the demographic profile of patients.

| Demographic characteristics | Group A (n=50) | Group B (n=50) | P-Value |
|-----------------------------|----------------|----------------|---------|
| Age (Years, mean±SD) | 43.12±11.9 | 40.12±10.07 | 0.190 |
| Gender (M/F) | 35/15 | 30/20 | 0.980 |
| Weight (Kg, mean±SD) | 64.58±6.97 | 63.12±7.34 | 0.582 |
| ASA I:ASA II | 28:22 | 29:21 | 0.794 |

Table 1: Sociodemographic profile of patients

ASA - American Society of Anaesthesiologists. VAS scores recorded at different time intervals were compared and are demonstrated in table 2.

| Time in hours | Group A | Group B | P value |
|---------------|----------|----------|---------|
| 1 | 2.0±0.04 | 2.3±0.65 | 0.043# |
| 2 | 2.2±0.91 | 2.8±0.64 | 0.061# |
| 6 | 2.9±1.01 | 4.1±1.02 | 0.001* |
| 12 | 2.8±0.87 | 3.4±0.93 | 0.036# |
| 18 | 2.8±0.32 | 3.3±0.57 | 0.050* |
| 24 | 2.9±0.65 | 3.4±0.76 | 0.067# |

Table 2:- Shows VAS scores at different time intervals (*significant #not significant)

Table 3 depicts the post-operative analgesic requirement with significant decrease in analgesic requirement in Group A (p value of <0.001).

| | Group A (n=50) | Group B (n=50) | P-value |
|---|----------------|----------------|---------|
| Analgesic Consumption (tramadol mg) | 58.0±37.96 | 106.5±45.29 | <0.001* |
| Patients requiring supplemental analgesic in first 6 hours, n (%) | 15(30%) | 32(64%) | 0.018# |
| Patients requiring supplemental analgesic in 6-12 hours | 4 (8%) | 12 (24%) | 0.041# |
| Patients requiring supplemental analgesic in 12-24 hours | 0(0%) | 1(2%) | 1.000# |

IV. Discussion

An effective postoperative pain management regimen can prevent pain related clinical complications and improve the patients quality of life^{4,5,6}. As compared to the laparoscopic procedures laparotomies result in much more pain that demands a better postoperative pain management. Besides the conventional analgesia that is being used intravenous or intramuscular local wound infiltration is also used for postoperative pain management. When used during general anaesthesia, additive local anaesthesia can reduce the need for systemic medication and intraoperative bleeding and postoperative pain management can be better controlled^{7,8}. Incision site local anaesthetic infiltration has been found to be effective for the management of postoperative pain (SAG). Ropivacaine is one such drug that is being popularly used for local infiltration. It is a new amino amide local anaesthetic. It is the monohydrate of hydrochloride salt of 1-propyl 2,6-pipecoloxylidide and is prepared as the pure S-enantiomer. The sensory block provided by Ropivacaine is similar to that produced by an equivalent dose of bupivacaine in intradermal and peripheral nerve block^{9,10,11}. The lower toxicity on the cardiac system and CNS when compared with that of bupivacaine enabled ropivacaine to be used for local infiltration in concentration of upto 1%^{12,13,14,15,16}. In our study we compared the efficacy of preincisional with postincisional ropivacaine in patients undergoing elective laparotomy. It was observed that preincisional ropivacaine wound infiltration given 10 mins before surgical incision resulted in decreased VAS score and tramadol consumption in post-operative period as compared to postincisional ropivacaine. The possibility that pain after surgery might be amplified by the noxious events induced by surgical incision was initially put forward by Crile¹⁷ and more recently by Wall¹⁸ who coined the term pre-emptive preoperative analgesia. Several studies have shown that preincisional treatment is more effective than the identical treatment administered after incision. Same results were observed in our study in terms of decreased VAS score in group A (preincisional ropivacaine) as compared to group B (postincisional ropivacaine). Furthermore, it has been shown that total analgesic consumption is

perhaps the most adequate outcome measure for showing a true pre-emptive effect¹⁹. In our study patients in group A required less analgesia in postoperative period as compared to group B patients. [Table 3]

V. Conclusion

It can be well concluded from our study that preincisional ropivacaine wound infiltration results in significantly decreased VAS scores and total analgesia consumption in the postoperative period as compared to postincisional ropivacaine wound infiltration.

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