



A STUDY TO COMPARE THE EFFECT OF RECTAL AND INTRAVENOUS INFUSION OF PARACETAMOL FOR POSTOPERATIVE ANALGESIA IN PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Background: Adequate and effective pain management after laparoscopic cholecystectomy is essential for patient comfort and early return to activity. Paracetamol is a widely used and cheap nonopioid analgesic with an excellent safety profile. **Aim:** To assess and evaluate the effect of rectal and intravenous infusion of paracetamol for post operative analgesia in patients undergoing laparoscopic cholecystectomy under general anesthesia. **Settings and Design:** We conducted a prospective, randomized controlled study (18-50 years of age) of the ASA- I and II patients scheduled for laparoscopic cholecystectomy. **Methods and Materials:** They were randomly allocated to 2 groups of 50 each. Group A received rectal paracetamol suppository 35-45 mg/kg immediately after intubation and group B received intravenous paracetamol infusion of 10-15mg/kg over 15min duration 20-25 min before finishing the surgery. Duration of analgesia was evaluated as primary outcome and other parameters as secondary outcome. **Statistical Tests:** Results were analyzed using Chi Square test for non-parametric data and ANOVA for parametric data. P value of less than 0.05 was considered significant. All statistical analyses were performed using the SPSS (17.0). **Results:** Duration of postoperative analgesia was significantly longer in group A as compared to group B. The requirement of supplemental rescue analgesia was also lower in group A compared to group B. No significant adverse effects were noted in both the groups. **Conclusion:** Paracetamol when given rectally has a better effect than intravenous paracetamol on the quality and duration of postoperative analgesia in laparoscopic cholecystectomy.

KEYWORDS

Laparoscopic cholecystectomy, rectal paracetamol, postoperative pain

INTRODUCTION

Laparoscopic cholecystectomy is one of the most commonly performed elective general surgical procedures. Effective and adequate postoperative pain relief is necessary for faster recovery, early ambulation and early return to normal activity. Paracetamol is considered a first line treatment for pain as per the WHO as it is safe and has minimal side effects as compared to opioid analgesics.

We have planned this study to compare the effectiveness of rectal and intravenous (IV) paracetamol for postoperative analgesia in laparoscopic cholecystectomy patients and the analgesic requirement in the first 24 h in postoperative period in the two groups.

MATERIALS AND METHODS

A prospective, randomized controlled study was conducted on 100 patients with ASA I or II physical status undergoing elective laparoscopic cholecystectomy under general anesthesia in a zonal level military hospital. Prior written informed consent was taken from all the patients and approval from the institutional ethics committee was taken for the study.

100 patients were randomized and included in 2 groups of 50 each. Rectal paracetamol suppository 40 mg/kg was given immediately after intubation to patients in Group A, whereas IV paracetamol infusion was given 20-25 mins before the end of surgery in Group B. patients in the age group 18-50 belonging to ASA class I and II, scheduled for elective laparoscopic cholecystectomy were included in the study. Exclusion criteria were known hypersensitivity or allergy to paracetamol, patients on treatment with analgesics for chronic conditions, hepatic, renal, CVS or lung disorders, psychiatric disorders or alcohol and drug abuse patients.

Details pertaining to clinical history, general and systemic examination and routine pre operative investigations such as CBC, LFT, RFT, Blood sugar fasting and post prandial, serum ALP were noted. All patients were premedicated on the night before surgery with Tab Ranitidine 150 mg and Tab Alprazolam 0.25mg, which were also repeated at 0600 hrs on the day of surgery.

General anesthesia was given prior to the surgery with premedication with Glycopyrrolate 0.2 mg, Ondansetron 4 mg, Midazolam 1 mg and Fentanyl 1.5-2 mcg/kg, propofol 2mg/kg, Atracurium 0.5 mg/kg, oxygen, and nitrous oxide (50-50 ratio) and 1% Sevoflurane were given for GA. Reversal was done with Neostigmine 50 mcg/kg and

Glycopyrrolate 10 mcg/kg. ECG, SpO₂, NIBP, heart rate and respiratory rate were monitored intra operatively.

Duration of analgesia was defined as the time interval between administration of the study drug and visual analog scale (VAS) ≥ 4 , i.e., time to administer rescue analgesia. Pain intensity was measured using VAS immediately in post op recovery room then 2 hourly till 24 h postoperative in the ward.

Rescue analgesia was given for pain score ≥ 4 in the form of intramuscular injection Diclofenac sodium 75 mg. Duration of analgesia, time required for first rescue analgesia, total dosage, and number of doses of rescue analgesia required in 24 h in each patient were noted. Hemodynamics were monitored both intraoperatively and postoperatively. In the postoperative period, patients were also monitored for adverse effects such as abdominal pain, nausea, vomiting.

RESULTS

The results were compiled and statistically analyzed using Chi-square test for non-parametric data and ANOVA for parametric data. Students paired t-test was applied wherever indicated using SPSS (17.0 version). We have used mean and standard deviation (SD) to represent the average and typical spread of value of variables. We have chosen the precision of our estimates of outcome statistics as 95% confidence interval. $P < 0.05$ was considered statistically significant. Duration of analgesia was taken as the primary outcome. Time to first rescue analgesia, total dosage and number of doses of rescue analgesia required in 24 hours and adverse effects were studied as the secondary outcomes.

Demographics including patient age, sex and ASA class distribution were comparable in both the groups [Table 1].

Table 1 : Demographic data

Variable	Group A	Group B
Age	40.22 $\pm$ 3.02	41.3 $\pm$ 2.87
GRADE I	43	44
GRADE II	7	6
MALE	6	4
FEMALE	44	46

Postoperatively, the duration of analgesia had been significantly longer in Group A as compared to Group B. [Table 2]. At 4 h postoperatively,

VAS scores were lower in Group A as compared to Group B. At 8 h postoperatively, VAS score was lower in Group B, because of rescue analgesia and more in Group A.

Table 2 : Postoperative outcome

Group	Mean±SD	(n=50)	Group A versus Group B
	Group A	Group B	
Duration of analgesia(min)	502.80±75054	316.20±85.75	0.000*
Total number of doses of rescue analgesia	1.48±0.54	2.4±0.65	0.000*
Total dosage of rescue analgesia	120.6±40.2	185.45±38.56	0.000*
Time to first rescue analgesia	505.20±78.7	324.8±86.02	0.000*

In other words, in Group A, duration of postoperative analgesia was prolonged as the requirement of rescue analgesia was after 8 h in this group. Total dose of rescue analgesia and number of analgesic dosages required was less in Group A, and time required to first rescue analgesia were longer in Group A. No significant adverse effects were noted in either of the groups.

DISCUSSION

A well formulated plan for post operative analgesia helps in early mobilization of the patients leading to early recovery, shorter stay in the hospital and early discharge from the hospital.^[1] This especially gains importance as laparoscopic cholecystectomy is being taken as a day care surgery in many hospitals.

Paracetamol is a widely used nonopioid drug for analgesia which is safe, cheap and is highly effective in managing post operative pain.^[2] It can be administered orally, rectally or intravenously to provide peri and postoperative analgesia.

The various advantages of administering it by rectal route are that it can easily be given in children, unconscious patients, and it avoids gastric irritation. The vascular supply in the rectum aids in good absorption of the drug.

The advantage of rectal paracetamol over IV could be due to slower rate of absorption lasting about 30-40 mins which leads to it reaching its peak plasma concentration after 2-3 hrs. as compared to this^[6], IV paracetamol reaches its maximum concentration in 15-20 mins. As a result, administration of Paracetamol by rectal route gives a longer duration of analgesia.

Various studies conducted by Marzban et al, Kulkarni et al, Capici et al, Mahajan et al show that rectal paracetamol leads to slower absorption and a longer time for the drug to achieve peak levels. It is recommended when a delayed and sustained effect is required, especially in view of its safety and opioid sparing effect.^[3,4,5,7,8,9]

Our study showed that the duration of analgesia was prolonged with rectal route of paracetamol administration as compared to IV, as effect site concentration is maintained for a longer period of time with rectal dose, in spite of lower bioavailability as compared to IV paracetamol.

CONCLUSION

We concluded that rectal paracetamol given after intubation improves postoperative analgesia in laparoscopic cholecystectomy cases as compared to IV paracetamol given intraoperatively, leading to early mobilization of the patient.

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Nil

Conflicts Of Interest

There are no conflicts of interest.

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