



## Original Research Article

# EFFICACY OF INTRAVENOUS PARACETAMOL AND DEXMEDETOMIDINE ON PREOPERATIVE HEMODYNAMICS AND POST OPERATIVE ANALGESIA FOR PATIENT UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY

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## ABSTRACT

**Background:** Multimodal analgesia regimes remain the best way to treat the post-laparoscopic pain. Two actively used compounds in multimodal analgesia are Paracetamol and dexmedetomidine alongside opioids. Phenacetin is a derivative of paracetamol, increasing the pain threshold by COXs inhibition within the CNS, but not inhibiting in peripheral tissues due to which is devoid anti-inflammatory. Hence, the present study was conducted for assessing the effectiveness of Intravenous Paracetamol on Preoperative Hemodynamics and Post Operative Analgesia for Patient Undergoing Laparoscopic Cholecystectomy.

**Materials & Methods:** A total of 50 patients belonging to either sex with American Society of Anesthesiologists (ASA) physical status I/ II and scheduled for elective laparoscopic cholecystectomy were enrolled. The intensity of the pain was assessed using visual analogue scale (VAS) at 0.5 h, 1 h, 4 h, 6 h. Where zero score corresponds to 'no pain' and 10 corresponds to the 'maximum' or 'worst pain'. Rescue analgesia was given in the form of inj. diclofenac sodium 75 mg i.v. at VAS >3. Total analgesic consumption in the first 24 h postoperatively and occurrence of nausea, vomiting and sedation were also recorded. Data were presented as frequency, percentages, mean, or standard deviation wherever applicable. Chi square test was used to assess categorical variables between the groups.

**Results:** Mean duration of surgery of the patients in Group P 40.00±11.43min. Heart rate started decreasing significantly in comparison to baseline. Systolic BP started decreasing significantly in comparison to baseline. Diastolic BP started decreasing in comparison to baseline. VAS score significantly improved over postoperative time.

**Conclusion:** Paracetamol showed hemodynamic maintenance and significant reduction in pain score. Hence, Paracetamol can be safely used.

**Key words:** Paracetamol, Laparoscopic cholecystectomy, Dexmedetomidine.

## INTRODUCTION

Laparoscopic surgical procedure is a way provide numerous merits; being much less intrusive permitting short recuperation period with a lesser morbidity and mortality rate. but, the usage of the pneumoperitoneum poses anaesthetic challenges, forcing the anaesthesiologist to apply optimal

anaesthetic strategies Which can give, fine surgical field and comprehensive patient care and ought to limit the chance of high blood pressure or hypotension, arrhythmias, hypoxia, hypercapnia pulmonary embolism, failure of heart, aspiration and pneumothorax; and attempt to keep away from the side outcomes of medication used, lowering the requirements thereof, to offer the patient a faster and

satisfactory recovery, and better postoperative analgesia with minimum consequences.<sup>[1-3]</sup>

Various opinions have been given for a technique-based evaluation of the analgesia post laparoscopic cholecystectomy. post-operative pain has been diminished in comparison with open conventional cholecystectomy, yet adequate analgesia post laparoscopic cholecystectomy still persists to be an anaesthetic challenge. 17–41% of the operated patients, primary purpose of stay in the ward being having pain, 4–8% patient has dominating complaint being pain and it has been number one cause of delayed recuperation after surgery. it has been presumed that extreme pain post LC can also forecast the initiation of consistent pain post laparoscopic cholecystectomy pain syndrome, but yet to be assessed.<sup>[4-9]</sup>

Rationality of post-operative quantitative estimates from non-procedure-unique assessment has currently been wondered due to the fact data are derived from various methods, which may avert the interpretation of the quantity had to deal with for specific surgery. Though substantial pain reduction is obtained by LC., pain may persist because of irritation of diaphragm by CO<sub>2</sub> gases retained inside the abdominal cavity.<sup>[8]</sup> Prophylactic analgesia can drastically decrease the onset and degree of pain and reduce the VAS score drastically thereby patient can remain pain free post-surgery. Multimodal analgesia regimes remain the best way to treat the post-laparoscopic pain. Two actively used compounds in multimodal analgesia are Paracetamol and dexmedetomidine alongside opioids. Phenacetin is a derivative of paracetamol, increasing the pain threshold by COXs inhibition within the CNS, but not inhibiting in peripheral tissues due to which is devoid anti-inflammatory.<sup>[9-11]</sup> Hence; the present study was conducted for assessing the effectiveness of Intravenous Paracetamol on Preoperative Hemodynamics and Post Operative Analgesia for Patient Undergoing Laparoscopic Cholecystectomy.

## MATERIAL AND METHODS

The present study was conducted for evaluating the effectiveness of Intravenous Paracetamol and Dexmedetomidine on Preoperative Hemodynamics and Post Operative Analgesia for Patient Undergoing Laparoscopic Cholecystectomy. A total

of 50 patients belonging to either sex with American Society of Anesthesiologists (ASA) physical status I/ II and scheduled for elective laparoscopic cholecystectomy were enrolled. Complete demographic and clinical details of all the patients were obtained. The study was conducted for a period of 18 months including data collection, data organization, presentation, data analysis and data interpretation. In the preoperative assessment, the patients were educated about visual analogue scale and communicate regarding the need for rescue analgesics in the postoperative period. Patients were kept nil orally for solid food for eight hours and for clear fluid was allowed till 2 hours prior to surgery. Iv line was secured in preoperative room preferably 18 g cannula before scheduled time iv infusion ringer lactate @ 8 -10 ml /kg. After instituting routine monitoring i.e., 3 lead Electrocardiogram (ECG), saturation of oxygen (SpO<sub>2</sub>) and non-invasive blood pressure (NIBP), the baseline parameters were recorded. Patients received intravenous paracetamol 1 gm, 15 min prior to induction. 100ml of drug were infused over 15 min. The intensity of the pain was assessed using visual analogue scale (VAS) at 0.5 h, 1 h, 4 h, 6 h. Where zero score corresponds to 'no pain' and 10 corresponds to the 'maximum' or 'worst pain'. Rescue analgesia was given in the form of inj. diclofenac sodium 75 mg i.v. at VAS >3. Total analgesic consumption in the first 24 h postoperatively and occurrence of nausea, vomiting and sedation were also recorded. Data were presented as frequency, percentages, mean, or standard deviation wherever applicable. Chi square test was used to assess categorical variables between the groups.

## RESULTS

Mean age of the patients was 42.86±11.28 years. Females predominated males with a ratio of 3:1. Mean BMI of the patients in Group P was 21.63±1.80kg/m<sup>2</sup>. Mean duration of surgery of the patients in Group P 40.00±11.43min. Heart rate started decreasing significantly in comparison to baseline. Systolic BP started decreasing significantly in comparison to baseline. Diastolic BP started decreasing in comparison to baseline. VAS score significantly improved over postoperative time.

**Table 1: Comparison of mean heart rate at different intervals**

Time interval	Group P (n=50)
Baseline	73.50 ± 4.43
Induction	70.94 ± 4.62
Post Inflation	68.82 ± 5.06
5 Min	66.42 ± 5.66
10 Min	65.78 ± 4.52
15 Min	65.04 ± 2.23
30 Min	63.60 ± 1.94
45 Min	62.62 ± 1.44
1 Hour	65.04 ± 2.23
2 Hour	63.60 ± 1.94

4 Hour	68.62 ± 1.44
6 Hour	69.62 ± 1.44

**Table 2: Comparison of mean systolic BP at different intervals**

Time interval	Group P (n=50)
Baseline	123.00 ± 5.94
Induction	120.04 ± 5.92
Post Inflation	115.30 ± 6.12
5 Min	109.02 ± 12.17
10 Min	107.38 ± 4.88
15 Min	103.08 ± 8.00
30 Min	99.88 ± 4.62
45 Min	95.74 ± 4.28
1 Hour	107.38 ± 4.88
2 Hour	113.08 ± 8.00
4 Hour	118.88 ± 4.62
6 Hour	118.74 ± 4.28

**Table 3: Comparison of mean diastolic BP at different intervals**

Time interval	Group P (n=50)
Baseline	78.14 ± 5.26
Induction	75.02 ± 5.15
Post Inflation	70.62 ± 5.02
5 Min	65.92 ± 7.55
10 Min	64.70 ± 4.26
15 Min	60.48 ± 5.79
30 Min	59.20 ± 3.94
45 Min	61.04 ± 3.93
1 Hour	64.60 ± 4.30
2 Hour	66.48 ± 5.79
4 Hour	59.20 ± 3.95
6 Hour	72.04 ± 3.93

**Table 4: Comparison of mean VAS at different intervals**

VAS	Group P (n=50)	P-Value
15 Min	2.44 ± 0.84	0.001 (Significant)
30 Min	2.24 ± 0.66	
45 Min	2.20 ± 0.61	
1 Hour	2.44 ± 0.84	
2 Hour	2.24 ± 0.66	
3 Hour	2.20 ± 0.61	
4 Hour	1.60 ± 0.99	
5 Hour	1.16 ± 0.99	
6 Hour	0.96 ± 1.00	

## DISCUSSION

Paracetamol is superior to other NSAIDs, like aspirin it has both analgesic and antipyretic effects, it has no main facet outcomes which includes no gastric ulceration, impaired platelet adhesion, and delirious cardiac and renal consequences. The mechanism of action is inhibition of cyclooxygenase (COX) 3 enzyme, prostaglandin production in CNS is decreased. Together with that, it causes modifications in descending inhibitory serotonergic pathway, and reacts on opioidergic system and NMDA receptors. Diclofenac pharmacodynamics was by means inhibiting COX-1 and COX-2 enzymes with relative equipotency and which in turn reduce PG synthesis at the same time in vivo results of paracetamol are similar to those of the selective COX-2 inhibitors.<sup>[17]</sup> Intramuscular .IM diclofenac has mounted function as an effective post-operative pain-reliever even for primary surgical procedures. Intravenous (IV) paracetamol (acetaminophen) is recently gaining global

popularity in acute post-operative pain comfort.<sup>12- 16</sup> Previous studies have concluded that iv paracetamol gives better quality of analgesia than iv diclofenac in post op period. Preemptive analgesia is the treatment initiated before and during operational during the surgical procedure in order to reduce the physiological consequences of nociceptive transmission provoked by the procedure alteration of central processing of afferent input from injuries.<sup>[15-17]</sup> Hence; the present study was conducted for assessing the effectiveness of Intravenous Paracetamol on Preoperative Hemodynamics and Post Operative Analgesia for Patient Undergoing Laparoscopic Cholecystectomy. The mean age of the patients was 42.86±11.28 years. Females predominated males with a ratio of 3:1. Mean BMI of the patients in Group P was 21.63±1.80kg/m<sup>2</sup>. Mean duration of surgery of the patients in Group P 40.00±11.43min. Heart rate started decreasing significantly in comparison to baseline. Systolic BP started decreasing significantly in comparison to baseline. Diastolic BP

started decreasing in comparison to baseline. VAS score significantly improved over postoperative time. Talke et al. in 1995 in their study showed that both HR and SBP reduced in response to the 1 h Dexmedetomidine infusion to the targeted plasma conc. of 0.45 ng/ml, which appears to benefit perioperative hemodynamic management in patients undergoing vascular surgery. In another study, Talke et al. administered Dexmedetomidine infusion for its ability to attenuate stress responses during emergence from anesthesia after major vascular operation and found that Dexmedetomidine attenuates increase in HR and plasma noradrenaline concentration during emergence from anesthesia.<sup>[17,18]</sup> Parween, J et al conducted a study on eighty American Society of Anesthesiologists (ASA) Grade I and Grade II physical status patients aged 18–65 years, of both genders, were selected for elective upper limb orthopedic surgical procedure under general anesthesia. Group P (paracetamol) patients were given 1 g paracetamol intravenously 30 min before surgery. Group D patients, 100 µg DMED/20 mL normal saline, was administered intravenously 30 min before surgery. Post-operative hemodynamic variables, post-operative pain scores (Visual Analogue Scale score), need for rescue analgesics and post-operative complication were recorded and treated accordingly. In both groups, females were in the majority with ASA grade I in the majority of the cases in both groups. Mean heart rate, mean arterial pressure, and Visual Analog Score for pain were comparable between the groups were compared at different time intervals (2, 4, 6, 12, 18, and 24 h) ( $p > 0.05$ ). Regarding complications Nausea, vomiting, itching and stomach irritation was in 17.5%, 15.0%, 7.5% and 20.0% for group D and for group P nausea and vomiting was in 15.0% and 10.0% and no other complication occurs in group D. Pre-emptive administration of paracetamol is a cost-effective and safe method of providing post-operative analgesia for patients undergoing upper limbs surgery.<sup>[19]</sup>

## CONCLUSION

Paracetamol showed hemodynamic maintenance and significant reduction in pain score. Hence; Paracetamol can be safely used.

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