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# COMPARATIVE STUDY OF HIGH DOSE VITAMIN C AND PARACETAMOL IN PAIN RELIEF IN PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY

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**ABSTRACT** **Background and Aims:** As laparoscopic surgeries are becoming most common now a days,pain management in laparoscopic surgeries plays very important role. NSAIDS and opioids have its own side effects. Injection Vitamin C has less adverse effect and better intra operative and post operative pain control. **Methods:** Fourty patients aged 18 to 65 years ,with ASA 1 and 2,undergoing laparoscopic cholecystectomy were chosen for the study and randomised into 2 groups.Group A(n=20) received injection vitamin c 2gm iv over 20 minutes soon after induction and Group B (n=20) received injection paracetamol 15 mg/kg body weight soon after induction .pre operative ,intra operative and post operative haemodynamic parameters are noted in both cases.Post operative visual analog scale(VAS) score and rescue analgesic(InjTramdol) is assessed in both the groups. **Results:** Post operative VAS score in Group A is (4±1.2) is significantly less compared to Group B(6±1.4).Rescue analgesic consumption was significantly lower in GroupA [50 (25)] mg vs Group B[100 (50)]mg.Intraoperativelyhaemodynamics were more stable in Group A compared to Group B. **Conclusion:** Patients who received injection vitamin c have better pain relief and less rescue analgesic requirement post operatively.

**KEYWORDS :** Injection Vitamin C , Injection Paracetamol , Laparoscopic Cholecystectomy, Injection Tramadol.

## INRODUCTION

Though laparoscopic surgeries are less painful,postoperative pain relief still a challenge to anaesthesiologist.

Inadequate postoperative analgesia can lead to adverse events such as pneumonia, myocardial infarction, insomnia, and depression, thereby increasing morbidity and mortality and diminishing quality of life and patient satisfaction[1].

Opioids, which are still the most widely used class of analgesics in postoperative pain management, can increase the risk of postoperative nausea and vomiting (PONV) and can delay postsurgical recovery of gastrointestinal mobility. Recently, nonopioidanalgesic alternatives have been introduced with the aim of improving pain management and limiting opioid-related side effects [2]

Non Opiod analgesic Vitamin C (ascorbic acid) is used which is water soluble,anti-oxidant, neuroprotective, neuromodulatory[3,4] (specifically Dopamine and Glutamate mediate) effects and it causes inhibition of the N-methyl-D-aspartate (NMDA) whichis responsible for chemical induced pain model. Recent studies have shown its usefulness in adequate for pain management without much side effect[5-7]

There are not much studies are available on high dose Vitamin c as a substitute for opiod in pain relief in patients undergoing laparoscopic cholecystectomy.

## AIM AND OBJECTIVES

- Compare VAS score in both groups
- Requirment of rescue analgesic(InjTramadol) in first 24 hours
- Haemodynamic parameters

### Criteria

### Inclusion Criteria:

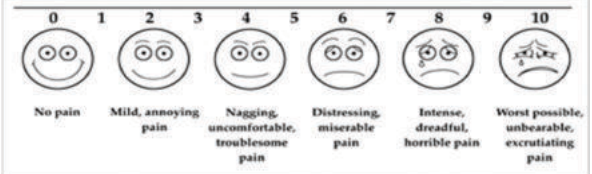
- Patient willing to give informed written consent
- Age between 18-65 years
- Patients with ASA grade I & II

### Exclusion Criteria:

- Patients not willing to give informed written consent for the procedure
- Uncontrolled diabetes mellitus, hypertension, cardiac disorders, neuropathies, patients with chronic analgesic use, psychiatric medications
- Pregnancy.
- Patients who are allergic to injection tramadol

## MATERIALS AND METHODS

- After obtaining ethical committee clearance and informed consent, Fourty patients aged18 to 65 years with ASA 1and 2 undergoing laparoscopic cholecystectomy were chosen for the study and randamised into 2 groups.All patients were premedicated with injection midazolam 0.004 mg/kg
- Induction was achieved in sequence using lidocaine 1.5mg/kg,fentanyl 2mcq/kg and propfol 2mg/kg
- Rocuronium 0.6 mg/kg was used facilitates tracheal intubation.
- Sevoflurane (2-4%) in a mixture of oxygen and air was used for maintainance.
- Group A (n=20) received injection Vitamin C 2gm intravenously over 20 minutes soon after induction
- Group B (n=20)received injection paracetamol 15mg/kg body weight soon after induction
- Pre-operative ,intra-operative and post-operative haemodynamic parameters were noted in both cases.
- Post operative visual analogue score(VAS) and rescue analgesic (injection Tramadol) requirement were assessed in both the cases.
- VAS score is depicted as fallows



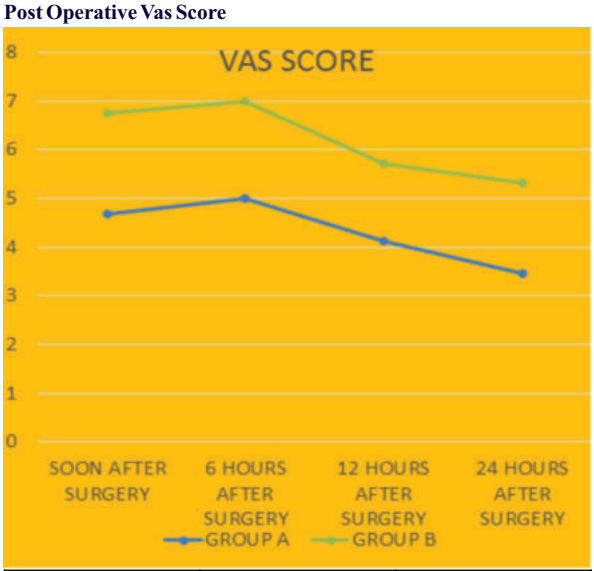

## RESULTS

### Demographic Parameters

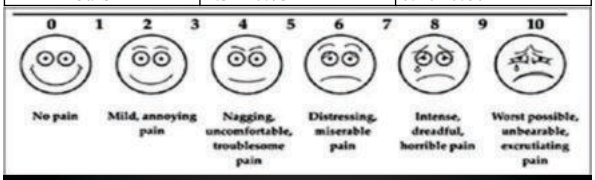
| Parameter | Group A | Group B |
|---|---|---|
| Age In Years | 48.95±9.1 | 42.67±9.4 |
| Gender Distribution | 10:6 | 9:7 |
| Duration Of Surgery | 63±17.21 | 72.40±36 |
| Type Of Surgery | Laparoscopic Cholecystectomy | Laparoscopic Cholecystectomy |

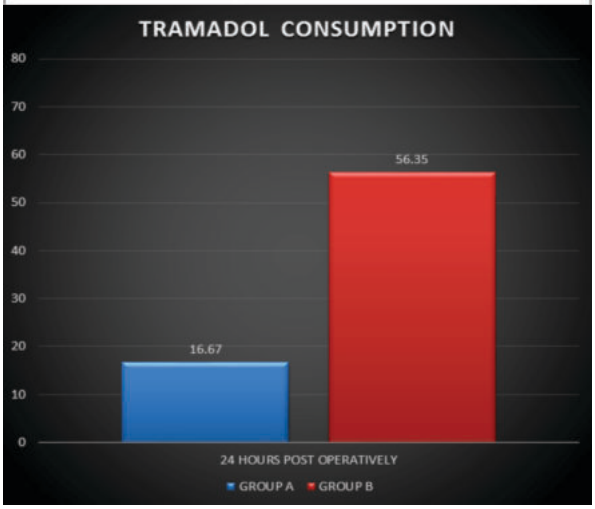
Demographic Parameters Were Comparable Between The Groups

**Post Operative Vas Score**

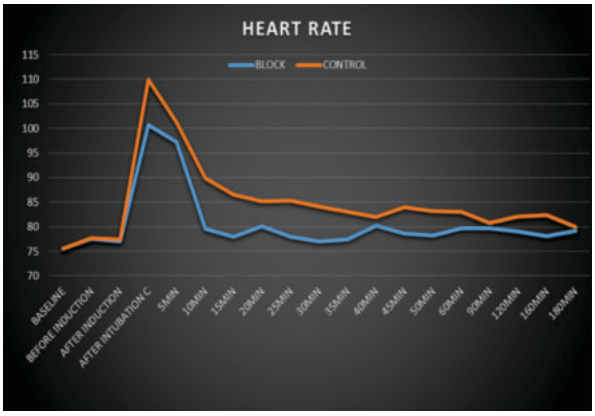



| Vas Score | Group A | Group B |
|---|---|---|
| Soon After Surgey | 4.68±0.749 | 6.76±0.831 |
| 6 Hours | 5.00±0.816 | 7.00±1.049 |
| 12 Hours | 4.11±0.737 | 5.71±0.956 |
| 24 Hours | 3.47±0.612 | 5.33±.658 |
| In 24 Hours | 4.32±0.73 | 6.20±0.87 |

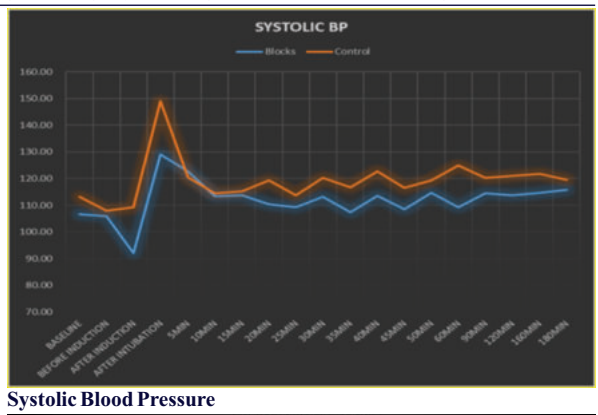


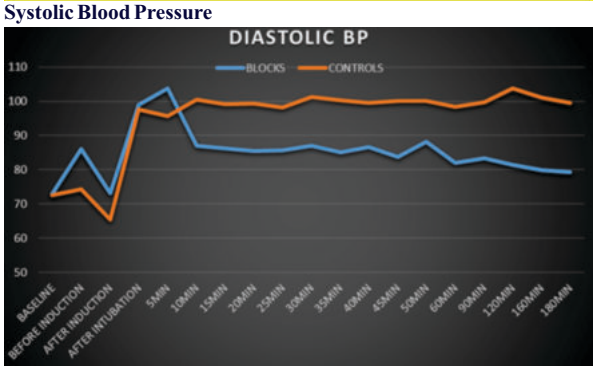

**Rescue Analgesia Requirement**




**Heartrate**




**Systolic Blood Pressure**




**Diastolic Blood Pressure**

## DISCUSSION

Intravenous supplementation with 50 mg/kg vitamin C decreased postoperative pain at rest during the first 24 h and postoperative Tramadol consumption during the first 2 h after laparoscopic colectomy. High dose vitamin C infusion also decreased the frequency of demand for rescue analgesics.

Vitamin C is an essential micronutrient that serves as a cofactor in a number of enzymatic and chemical pathways [8]. The exact mechanism of the analgesic effect of vitamin C is not well understood, and several of the functions of vitamin C may contribute. As an antioxidant, vitamin C inhibits the formation of reactive oxygen and nitrogen species. Reactive oxygen species (ROS) are a known factor in neuropathic pain, and ROS scavengers can ameliorate mechanical discomfort[9].A combination of antioxidants reduced levels of ROS and normalized tail flick latency in a mechanically induced animal pain model [10].Vitamin C also has a neuromodulating function [11], specifically of dopamine- and glutamate-mediated neurotransmission [12]. Inhibition of the NMDA receptor by vitamin C decreases pain in chemically induced pain models [13]. Vitamin C is a key cofactor of dopamine b-monooxygenase and it is essential for norepinephrine biosynthesis. The conversion of dopamine to norepinephrine by dopamine b-monooxygenase is maximally efficient only in environments replete with extracellular ascorbic acid [14]. Finally, vitamin C is required for the release of noradrenaline and acetylcholine from synaptic vesicles [15]. These neurotransmitters are known to be the main components of the inhibitory pain pathway [16].The plasma vitamin C concentration increases rapidly after the start of an infusion and rapidly decreases once the infusion is finished. Peak plasma vitamin C concentrations occur immediately upon completion of a vitamin C infusion [17]. In our study, the vitamin C group had a higher plasma vitamin C concentration after surgery compared to the paracetamol group. The patients who received high dose (50 mg/ kg) intravenous vitamin C at the start of surgery were apparently able to maintain higher plasma vitamin C concentrations throughout the surgery and in the early postoperative period, which may have been associated with decreased tramadol consumption during the first 2 h after surgery and with the decreased pain scores at rest during first 24 h.

In conclusion, this study reports the effect of high dose intravenous supplementation of vitamin C on postoperative pain control. We found that infusion of vitamin C (50 mg/kg over 30 min) immediately after induction of anesthesia resulted in higher plasma concentrations of vitamin C at the completion of surgery and that it was associated with significantly reduced tramadol consumption in the early postoperative

period, along with significantly lower pain scores at rest during the first 24 h after surgery. Further research is warranted to examine whether higher doses and longer infusion times would amplify this effect.

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