

COMPARATIVE ANALYSIS BETWEEN ERAS AND CONVENTIONAL CARE IN ELECTIVE LAPAROSCOPIC CHOLECYSTECTOMY

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Abstract

Background: Enhanced recovery after surgery is a combined effort of care, applied perioperatively to reduce surgical stress. Length of hospital stay has been reported to be reduced in multiple studies in all surgical specialities. Purpose of this study is to compare effect of ERAS and conventional care in hospital setting in rural area. **Materials and Methods:** This RCT was conducted in Department of General Surgery in TMU Moradabad and GMC Miraj from July 2021 to June 2022. Random allocation in two groups of 150 was done. Length of hospital stay was calculated, frequency of SSI, mortality and readmissions were recorded. **Result:** Patients in ERAS group showed significant reduction in length of hospital stay -30.2 hours in ERAS group Vs. 42.5 hours in conventional group. **Conclusion:** ERAS protocols demonstrated a reduction in length of perioperative hospital stay and no increase in readmissions.

INTRODUCTION

Cholecystectomy is one the most commonly performed surgery in India. Previously, open Cholecystectomy was the surgery of choice in these cases which is still considered one of the major surgeries.

Lap. Cholecystectomy is a minimally invasive surgical procedure for removal of gall bladder. Lap. Cholecystectomy has completely replaced open cholecystectomy since 1990s. It is now essentially seen as a modality of choice to reduce the disease burden in Rural India.

ERAS is a multi-modal perioperative care protocol designed to decrease major morbidity and promote accelerated post operative recovery due to increased understanding of Neurohormonal Processes involved in response to stress induced by surgery itself and evaluating methods to tackle stress in an effective way.^[1]

It was pioneered by Henrik Kehlet in colorectal surgery and since has been steadily applied in other branches of surgery for reducing surgical stress and associated organ dysfunction.^[2]

One aspect of ERAS is that it reduces length of hospital stay without any increase in complications, readmissions or delay in recovery.^[3,4,5,6,7,8,9,10,11]

MATERIALS AND METHODS

Following the approval by ethical committee of the hospital. Total of 300 patients were selected by consecutive sampling after meeting inclusion and exclusion criteria. Patients were randomly allocated into two groups after taking informed consent. Randomisation was done by chit method into two groups designating one group as ERAS group and another group as Conventional Group. Patient age, sex and ASA Score were recorded. Appropriate perioperative parameters were applied in perioperative period to each group. Outcomes like length of hospital stay, readmissions, frequency of SSI were recorded for each patient. Total opioid dose was recorded in form of morphine equivalent units. Difference of score from baseline for all patients was calculated and their mean compared in each group. Kolmogorov Smirnov Test was used to assess the distribution of data. Data were reported as Mean \pm SD or frequencies (%) where applicable. Mean difference within the groups were compared by student t test. P value less than 0.05 was considered statistically significant. Categorical variables were analysed by chi-squared test.

RESULTS

Total of 300 patients include in the study. Out of 300 patients 150 patients were divided in each of the two group. However, 3 patients from ERAS group and 2 patients in conventional group dropped out due to conversion of laparoscopic cholecystectomy to open cholecystectomy for various reasons. There was no statistically significant differences in age, gender, ASA status between these groups. ERAS Group showed statistically significant reduction in mean

length of hospital stay 30.2 hours± 9.95 hours in comparison to conventional group 42.5 hours ± 11.6 hours.

Results also demonstrated reduction in total opioid use in ERAS group 12.6±4.2 morphine equivalent units Vs, 18.9±7.1 in conventional group. Rate of readmission; 4.5 % in ERAS Vs. 8.4 % in conventional care group, where p=0.341

SSI- 3.2% in ERAS Vs. 6.2% in conventional care group where p= 0.484

These differences were not statistically significant. No mortality was noted in each group.

Table 1: Inclusion and Exclusion Criteria

| Inclusion Criteria | Exclusion Criteria | Drop out criteria |
|---|---|------------------------------------|
| Age 18 to 60 years Indications: Uncomplicated Gall Bladder Stone Disease | Age than 18 years Complicated Gall Bladder Stone disease ASA 3 or greater OP complications Biliary Tract Injury | Conversion to open cholecystectomy |

Table 2: Eras group vs. Conventional group

| Eras group | Conventional group |
|---|--|
| PRE-OP Eras specific counselling Normal meal at night +Carbohydrate drinksX2 Antibiotics at time of Induction INTRA OP TIME OF OPERATION Pre-emptive nausea vomiting prophylaxis No NG or Drain Placement Pre-emptive multimodal analgesia POST OP Early feeding Early mobilisation Opioid sparing multimodal analgesia | PRE-OP Normal counselling Overnight fast Antibiotics at time of induction INTRA OP TIME OF OPERATION Drain/NG by surgeon's preference Analgesia as decided by care team Post op Opioid analgesia when required POST OP Feeding, mobilisation and discharge as per conventional care. |

Table 3: Demographics

| | ERAS (n=147) | Conventional group(n=148) |
|------------|--------------|---------------------------|
| Sex | | |
| Male | 68 | 70 |
| Female | 79 | 78 |
| Age | 43.68±12.81 | 44.02±13.08 |
| ASA Status | | |
| I | 132 | 134 |
| II | 7 | 8 |
| III | 8 | 6 |

Table 4: Outcomes

| | ERAS (n=147) | Conventional group(n=148) |
|--|------------------------|---------------------------|
| Length of Hospital Stay | 30.2 hours± 9.95 hours | 42.5 hours ± 11.6 hours |
| Total Opioid Use (morphine equivalent units) | 12.6±4.2 | 18.9±7.1 |
| Readmissions | 7 | 12 |
| Surgical Site Infection | 5 | 9 |

DISCUSSION

Elective laparoscopic Cholecystectomy is now widely being accepted as day case management. Major complaints reported after laparoscopic cholecystectomy were post-operative nausea, vomiting and pain. Faster discharge doesn't impede quality of care, recovery and patient's satisfaction. Outpatient basis laparoscopic cholecystectomy is associated with faster discharge. For the ever-

growing population of patients against limited resources efficient use of healthcare resources is the need of the hour.

ERAS bundle essentially incorporates decreased length of hospital stay of 30.2 ±9.95 hours in comparison to 42.5±11.6 hours in conventional care group. Similar trend is reflected in other studies as well. In some studies after implementation of the protocols same day discharges have also increased significantly embracing patient's compliance. Reduction of total opioid use in form of morphine

equivalent units in ERAS to 12.6 ± 4.2 from 18.9 ± 7.1 in conventional group has also been observed. Additionally, readmissions rates post operatively have been reduced from 12 in conventional group to 7 in ERAS group.

Significant cause of morbidity and mortality post operatively is Surgical Site Infections. Reduction of Surgical site infections from 9 in conventional group to 5 in ERAS has also been recorded. Various studies have also pointed towards reduced post-operative nausea, vomiting, hematoma and analgesia. The above observations makes ERAS highly preferential. Addedly, more vacant hospital beds and same limited resources can be accounted for better resource management. Reduced burden on hospital resources makes them available for the deprived. Benefitting the long waiting patients for Elective Surgery. Introspectively, faster discharges will lead to burdening of Out Patients Department.

However, documentation of experience their local adaptations and necessary feedbacks are essential for augmenting ERAS protocols. Underlying challenges include cultural and practical challenges in decreasing duration of stay. Laparoscopic cholecystectomy still, is only available at limited tertiary care centres in India. Major rural population still lacks access to basic Health resources in India. Due to lack of knowledge and no nearby health facility in case of major complication most patients prefer to prolong their stay in hospital even after essential recovery has been attained for discharge. Broadening the inclusion criteria and restricting the exclusion criteria in further studies can help to strengthen the ERAS protocols for comorbid conditions as well. Synchronisation with combined care involving multiple departments is need of the hour for the implementations of these guidelines.

CONCLUSION

Compared to conventional care, Enhanced recovery after surgery protocols showed significant reduction in length of hospital stay, without increasing readmissions or changing patient reported outcome scores despite early discharge.

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