"COMPARISION OF MODIFIED ALDRETE SCORE VERSUS FAST TRACK CRITERIA FOR EVALUATING POSTOPERATIVE RECOVERY IN PATIENTS UNDERGOING LAPAROSCOPIC SURGERY"

By

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ABBREVIATIONS

ASA- American society of anaesthesiologists

VAS- Visual analogue score

MAS- Modified Aldrete Score

FTC- Fast Track Criteria

SPEEDS-saturation, pain, extremity movement, emesis, dialogue, stable vital signs

PACU-Post Anaesthesia Care Unit

HDU-High Dependency Unit

TBD-Time based discharge

ERAS-Enhanced Recovery After Surgery

PONV-Postoperative Nausea and Vomiting

GA-General Anaesthesia

OR-Operating Room

RR-Recovery Room

LMIC-Low to Middle Income Country

LC-Laparoscopic Cholecystectomy

LT-Laparoscopic Tubal Ligation

HR-Heart Rate

SBP-Systolic Blood Pressure

DBP-Diastolic Blood Pressure

Spo2-Oxygen Saturation

Hr- Hour

Mg- milligrams

Mins- minutes

Kg-kilograms

NSAIDS- Nonsteroidal anti- inflammatory drugs

Vs- Versus

Inj- Injection

TENS-Transcutaneous electrical nerve stimulation

5-HT- 5-Hydroxy Tryptamine

NMDA-N-methyl D-Aspartate

GABA- Gamma amino butyric acid

α – Alpha

β – Beta

MAC-Minimum Alveolar Concentration

GI – Gastrointestinal

HTN-Hypertension

DM-Diabetes Mellitus

Etc- et cetera

ABSTRACT

BACKGROUND

With the advent of minimally invasive laparoscopic surgeries, more patients with comorbidities are accepted for surgery. Early recovery after surgery is marked by regular and spontaneous respiration, awake patient, haemodynamic stability, appropriate oxygen saturation and adequate motor activity, patient is moved to a step down unit for Phase II recovery where he/she is followed up and readied to go home [1].

Modified Aldrete score and fast-track criteria [2-5] are the two commonly used scoring systems to assess recovery from general anaesthesia. With increasing number of laparoscopic surgeries where patients are discharged early, a recovery assessment tool with inbuilt assessment of the pain and nausea was deemed necessary so that health care providers are fairly confident in their decision to discharge a patient safely.

AIM

The aim of the study is to compare modified aldrete score with fasttrack criteria for evaluating post operative recovery in patients undergoing Laparoscopic surgery

OBJECTIVES

Recovery for all enrolled patients to be assessed using modified Aldrete score or fast-track criteria.Scores to be recorded every 5 minutes until 30 minutes of tracheal extubation. The time point of attainment of a score of ≥ 9 according to MAS and ≥ 12 according to FTC to be recorded. The scores to be recorded at 2, 6, 12 and 24 hours following tracheal extubation.

To ascertain the frequency and time of incidence of problems like nausea and vomiting ,haemodynamic instability, altered conscious levels after shifting to phase II recovery area.

METHODS

Study method : Hospital based observational study.

Study Period: One and half year from December 2019 to september 2021

Sample size Considering, the approximate mean time (± SD) to recovery as 12 ± 5.7 and 16.4 ± 6.9 minutes for modified Aldrete score (MAS) and fast-track criteria(FTC) respectively the study would require a sample size of 40 per each group (i.e. a total sample size of 80)to achieve a power of 80% and level of significance of 2% for detecting the difference in means between two groups.

Source of data: This study was be carried out in Department of Anesthesiology, B.L.D.E.(DU)'s. Shri. B. M. Patil Medical College, Hospital and Research center, Vijayapura.

RESULTS

Mean time to recovery from anaesthesia was found to be 20.5 ± 5.41 and 16.88 ± 6.95 minutes when assessed by MAS (score ≥9) and FTC (score ≥12), respectively.

At 4-6 hours post-extubation a dip in the FTC scores were observed in 12.5% of the subjects though the MAS scores remained unaffected. This corresponds to the incidence of severe post-op pain and nausea vomiting in the study subjects. Older age >35 years, pre-operative medication with fentanyl and midazolam and duration of surgery are factors which were significantly associated with time to recovery. FTC and MAS seem to be equally good in assessing recovery in immediate postoperative period from general anaesthesia after laparoscopic surgery.However, FTC is better for documenting adequate recovery for transfer of patients from post-anaesthesia-care-unit to the ward as it provides assessment of postoperative-nausea-vomiting (PONV) and pain.

CONCLUSION

It is important that adequate recovery from general anaesthesia must be documented prior to shifting the patient from operation theatre to PACU / HDU immediately after surgery and then again prior to transfer from PACU / HDU to the general ward.

Fasttrack criteria and modified Aldrete score seem to be equally good in assessing immediate recovery from general anaesthesia after laparoscopic surgery, prior to shifting patient from operation theatre to PACU / HDU.

However, the former criterion is better for documenting adequate recovery for transfer of patient from PACU / HDU to the general ward as it provides assessment of PONV and pain.

KEYWORDS: POSTOPERATIVE RECOVERY, DISCHARGE CRITERIA, ALDRETE SCORE, FAST-TRACK CRITERIA, LAPAROSCOPIC SURGERY.

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INTRODUCTION

The advent of minimally invasive laparoscopic surgeries allowed more patients with comorbidities to undergo surgery. To deal with the dual problem of increasing patient load and limited resources of space, manpower and expensive monitoring equipment, it becomes prudent to shift patients from the operating room who attain recovery at the earliest [1,2]. [McGrath etal and White PF etal]

Early recovery after surgery is marked by regular and spontaneous respiration, awake patient, hemodynamic stability, adequate oxygen saturation and adequate motor activity. Once this is achieved the patient is moved to a step-down unit for Phase II recovery where he/she is followed up and readied to go home [1]. [Mcgrath etal]

Mostly, institutions in India have single post-anaesthesia care unit (PACU) which follows traditional time-based discharge (TBD) method. Criteria based discharge scoring systems are more time and resource efficient compared to traditional time-based discharge methods. This further helps in optimal utilization of available time and resources[3] [Jain A etal]

Modified Aldrete score and fast-track criteria [1,2,4-6] [McGrath etal, white etal, Aldrete etal, song D and Joshi Gp etal, song D and flymen etal] are the two commonly used scoring systems to assess recovery from general anaesthesia. The modified Aldrete scoring system (1995), is the

most widely used criteria which includes assessment of patient's consciousness, activity, respiration, blood pressure and oxygen saturation to determine recovery. A score of 0-2 is given for each of the five categories, for a maximum score of 10[3]. [Alderete etal]

Prevention of postoperative nausea and vomiting is one among the many key aspects of Enhanced recovery after surgery (ERAS) protocols. ERAS has become an essential part of modern-day surgery.[7] [Megan Melnyk etal]

Recently question has been raised as to whether the Aldrete scoring system is a safe and

efficient tool to use as it does not include an assessment for the pain or nausea that many patients experience following surgery and anaesthesia which can further delay recovery [8-11] [Chung F and Ritchie etal, Chung F and Mezei etal, Pawlin DJ etal, Awad etal]. Postoperative recovery profiles may also be adversely affected by medications that are associated with side effects viz; sedation, hypoventilation, nausea and vomiting [9] [Awad etal]. The important factors which lead to increased recovery times are elderly age, choice of drugs, increased operative times (which can be grouped under patient factors, drug factors, surgical, anaesthetic factors and metabolic factors). [11] With increasing number of laparoscopic surgeries where patients are discharged early, a recovery assessment tool with inbuilt assessment of the pain and nausea was deemed necessary so that health care providers are confident in their decision to discharge a patient safely.

The FastTrack criteria was hence developed, which includes assessment of postoperative nausea, vomiting and pain to assess recovery from general anaesthesia [2] [White PF etal]

However, this new criterion is seldom used in hospitals in India and till date there is limited data on comparison of the two scores to predict recovery from general anaesthesia (GA) after laparoscopic surgeries. In addition to have a fuller understanding of the time to recovery from GA after laparoscopic surgeries, it is important to understand how the recovery scores are useful for timely transfer of patients from operating room (OR) to post anaesthesia care unit (PACU) and/or to the ward. This knowledge will be critical for improvising smooth turnover of the patients from the operating room to their discharge.

AIMS AND OBJECTIVES OF THE STUDY

AIM:

The aim of the study is to compare modified Aldrete score with fast-track criteria for

evaluating post-operative recovery in patients undergoing laparoscopic surgery

OBJECTIVES OF THE STUDY:

-Recovery for all enrolled patients to be assessed using Modified Aldrete score or fast-track criteria.

- To record the time of tracheal extubation for each patient and scores to be recorded every 5 minutes until 30 minutes after tracheal extubation and 2, 6, 12 and 24 hours following tracheal extubation

-The time point of attainment of a score of ≥ 9 according to MAS and ≥ 12 according

to FTC to be recorded.

SECONDARY OBJECTIVE:

-To ascertain the frequency and time of occurrence of problems like nausea and vomiting, hemodynamic instability, altered conscious levels after shifting to phase II recovery area.

-Requirement of analgesics and antiemetics in phase II recovery area.

REVIEW OF LITERATURE

McGrath B, Chung F[1] etal reported that ambulatory surgery can provide quality care to the patient at much lower costs. Recent advances in field of surgery and anaesthesia allows much more patients to undergo elective surgeries on an ambulatory basis. Fast tracking allows earlier discharge of the patient, but it must be made sure to address issues like post-operative pain and postoperative nausea vomiting, as these minor adverse events can lead to patient dissatisfaction and a poor impression of ambulatory surgery.

Paul.F. White and Dajun Song in 1999[2] conducted a study comparing the new criteria for fast tacking after outpatient anaesthesia with Modified Aldrete scoring system. Recovery data from 216 consenting female outpatients undergoing either laparoscopic tubal ligation (LT) or cholecystectomy (LC) procedures. Times from discontinuation of the maintenance anesthetics to fast-track eligibility using the two scoring systems were recorded at 1-min intervals until 5 min after arrival in the PACU, and subsequently at 5-min intervals until the patient achieved fast-track eligibility using both scoring systems. When using Aldrete's scoring system, the times from discontinuation of anaesthesia to fast-track eligibility was significantly longer in patients receiving propofol (Versus desflurane or sevoflurane) anaesthesia, whereas there were no differences among the three anaesthetic techniques when using the fast-track scoring system. The results from this data evaluation demonstrated that 22%–29% of outpatients judged fast-track eligible using the modified Aldrete scoring system subsequently required IV analgesics and antiemetics. Although these patients were fully oriented and had stable vital signs, they would have added to the workload of the Phase II nursing staff and may have necessitated the use of more extensive monitoring. In conclusion, the new fast-track scoring system seems to offer

advantages over the modified Aldrete's scoring system in evaluating the suitability of outpatients for bypassing the PACU after undergoing ambulatory surgery with general Anaesthesia.

Anuj Jain, Varadarajan Muralidhar etal[3] in the study of hundred patients undergoing elective minor surgeries under general anaesthesia concluded that patients undergoing ambulatory minor surgeries, discharge times based on Criterion Based Discharge scoring systems such as modified Aldrete's and White's-fast are significantly lower in PACU Phase I as compared to the traditional Time-Based Discharge method.

Song D, van Vlymen J[6] etal conducted a study to test the hypothesis that use of volatile anesthetics (desflurane and sevoflurane) facilitates patients to achieve fast tracking criteria earlier than with propofol use. One hundred-twenty consenting women undergoing laparoscopic tubal ligation procedures were randomly assigned to one of three treatment groups After a standardized induction of anesthesia and tracheal intubation sequence, anesthesia was maintained with either desflurane 2%-6%, sevoflurane 0.6%-1.75%, or propofol 50-150 microg x kg(-1) x min(-1) in combination with nitrous oxide 60% in oxygen. The following advantages were noted in terms of cost effectiveness and higher percentage of outpatients being judged eligible for fast-tracking, when sevoflurane/desflurane were used instead of propofol.

Chung F, Ritchie E[8] etal in their study on postoperative pain in ambulatory surgery of 10008 patients undergoing ambulatory surgery observed that, in patients who had general anesthesia, the intraoperative dose of fentanyl was significantly smaller in the group with severe pain than in the group without severe pain when body mass index and duration of anesthesia were taken into

consideration. concluded that incidence of severe pain was 5.3% in the post anesthesia care unit, 1.7% in the ambulatory surgical unit, and 5.3% 24 h postoperatively. Body mass, duration of anesthesia, and certain types of surgery were significant predictors of pain in the post anesthesia care unit. These data will allow us to better predict those patients who need intense prophylactic analgesic therapy.

Chung F, Mezei G etal[9] conducted a study in 16411 patients to assess factors contributing to prolonged stay after ambulatory surgery. They concluded that length of postoperative stay among ambulatory surgical patients is mainly determined by the type of surgery and by adverse events, such as excessive pain, postoperative nausea and vomiting, dizziness, drowsiness, and untoward cardiovascular events. Patients with congestive heart failure and those who underwent long procedures had a higher risk of a prolonged stay. Appropriate prevention and management of postoperative symptoms could significantly decrease the length of stay among patients receiving general anesthesia.

Pavlin DJ, Chen C[10] etal in their study of 175 patients who underwent ambulatory surgery studied pain as a factor complicating recovery and discharge after ambulatory surgery concluded that Moderate to severe pain is common after ambulatory surgery and is a frequent cause of delayed discharge. Postoperative pain, opioid-related side effects, and time to discharge were less when nonsteroidal anti-inflammatory drugs or local anesthetics were used intraoperatively to prevent pain before patient awakening.

Awad IT, Frances Chung in 2006[11] published a review which provides contemporary perspectives on the issues of discharge criteria, fast-tracking, patient escort requirements, and

driving after ambulatory anaesthesia. This review supports that discharge scoring systems may be useful to guide discharge following ambulatory surgery. It is concluded that ensuring rapid postoperative recovery and safe discharge following ambulatory surgery are important components of the ambulatory surgical program. A clearly defined process should be established for each ambulatory surgical unit to ensure the safe and timely discharge of patients after anaesthesia, in accordance with current best evidence.

Ullhas Sudhakarrao Misal, Suchita Annasaheb Joshi[12] etal in 2016 have done a review on Delayed awakening from anaesthesia. With the general use of Fast-acting anaesthetic agents, patients usually awaken quickly in the postoperative period. The time to emerge from anaesthesia is affected by patient factors, anaesthetic factors, duration of surgery, and painful stimulation. The principal factors responsible for delayed awakening following anaesthesia are anaesthetic agents and medications used in the perioperative period. Nonpharmacological causes may have a serious sequel, hence recognizing these organic conditions is important. Certain underlying metabolic disorders such as hypoglycemia, severe hyperglycemia, and electrolyte imbalance, especially hypernatremia, hypoxia, hypercapnia, central anticholinergic syndrome, chronic hypertension, liver disease, hypoalbuminemia, uremia, and severe hypothyroidism may also be responsible for delayed recovery following anaesthesia. Unexpected, delayed emergence after general anaesthesia may also be due to intraoperative cerebral hypoxia, hemorrhage, embolism, or thrombosis. Accurate diagnosis of the underlying cause is the key for the institution of appropriate therapy, but primary management is to maintain airway, breathing, and circulation. This comprehensive review discusses the risk factors, causes, evaluation and management of delayed recovery based on our clinical experience, and literature search on the internet, supported by the standard textbooks of anaesthesiology. Delayed recovery from

anaesthesia is often multifactorial, and anaesthetic agents may not always be the culprit. When other causes are excluded, the possibility of acute intracranial event should be strongly considered. While the specific cause is being sought, primary management is always support of airway, breathing, and circulation. Good intraoperative care ensures the patient safety. A calm, comprehensive, and timely management with a systematic approach is highly rewarding. We, the anaesthesiologists, make the patient sleep, so the recovery from anaesthesia is our responsibility.

Sinclair R FR[13] etal studied the delayed recovery of consciousness after anesthesia and categorized causes of prolonged unconsciousness after anaesthesia into drug, patient and surgical factors. Various metabolic factors like Hypoglycemia, Hyperglycemia, Hyponatremia, Hypernatremia, Hypothermia, Central anticholinergic syndrome, Hypothyroidism, Hepatic or renal failure (uremia) and Sepsis have significant effect on recovery of consciousness, also it is worthwhile to note that Metabolic abnormalities will not present with the usual signs and symptoms in the anaesthetized patient. Patient factors (extreme ages, genetic variations and various disease processes), surgical factors (requirement for muscle relaxation, duration of surgery, utilization of regional techniques and degree of pain and stimulation) have their effect on recovery of unconsciousness. Organic causes of prolonged unconsciousness may have important sequelae that should be managed appropriately. Rarely, disassociative states may present with episodes of unconsciousness with no other identifiable cause.

Frost EA[14] etal in his review of various causes of delayed awakening from general anesthesia made recommendations that the general use of fast acting anesthetic agents, patients usually awaken quickly in the post-operative period. However, sometimes recovery is protracted and the list of possible causes in long. Accurate diagnosis is key to institution of appropriate therapy.

Brian Fredman,Edna Zohar,Offer Sheffer,Irena Paruta in 2002(15) conducted a study to assess the feasibility of geriatric patients (>65 yr) bypassing the post anaesthesia care unit (PACU) after ambulatory surgery. A secondary objective was to compare recovery profiles when using three different maintenance anaesthetics. Ninety ASA physical status I--III consenting outpatients (>65 yr) undergoing short urologic procedures were randomly assigned to one of three anaesthetic treatment groups. Recovery times, postanaesthesia recovery scores, and therapeutic interventions in the PACU were recorded. Although emergence times were similar in the three groups, the time to achieve a fast-track discharge score of 14 was significantly shorter in patients receiving desflurane compared with propofol and isoflurane (22 +/- 23 vs 33 +/- 25 and 44 +/- 36 min, respectively). On arrival in the PACU, a significantly larger percentage of patients receiving desflurane were judged to be fast-track eligible compared with those receiving either isoflurane and propofol (73% vs 43% and 44%, respectively). The number of therapeutic interventions in the PACU was also significantly larger in the Isoflurane group when compared with the Propofol and Desflurane groups (21 vs 11 and 7).the study concluded that Geriatric outpatients undergoing brief urologic procedures more rapidly achieve fast-tracking discharge criteria after desflurane (versus isoflurane and propofol) anaesthesia. Use of isoflurane was also associated with an increased need for nursing interventions in the early recovery period compared with desflurane and propofol.

Brent Burke, Mark Kyker in 2013[16] conducted a study comparing the speeds criteria, modified aldrete score and fast track criteria for evaluating recovery in our patients.The authors have developed criteria utilizing the mnemonic "SPEEDS" (**s**aturation, pain, extremity movement, emesis, dialogue, stable vitals signs) to evaluate and predict which patients would not require phase I nursing intervention and could transition to phase II recovery. Seventy-three adult surgery patients who underwent a standardized general anaesthetic procedure were evaluated with the modified Aldrete, Fast-Track and SPEEDS criteria immediately before leaving the OR and then 5, 10, 15 and 30 minutes after arrival in the recovery area. Significantly more patients met phase I bypass criteria when evaluated with Modified Aldrete (90%) and Fast-Track (94%) as compared to SPEEDS (77%) ($p < 0.0429$ modified Aldrete vs. SPEEDS, $p < 0.0038$ Fast-Track vs. SPEEDS). However, SPEEDS was more sensitive having a lower number of patients meeting phase II criteria yet requiring phase I intervention (32%) vs. Fast-track (43%) and Modified Aldrete (44%) ($p < 0.001$ SPEEDS vs. modified Aldrete and Fast-Track). SPEEDS was more accurate (74%) in predicting which patients should move directly to phase II compared to modified Aldrete (42%) ($p < 0.001$) and Fast-track (59%) ($p = 0.05$). This study concluded that SPEEDS criteria are as specific and more sensitive in determining phase I nursing interventions for ambulatory surgery patients when compared to modified Aldrete and Fast-Track

Mehrbanoo Amirshahi, Niaz Behnamfar[17] **etal** : Twenty-three studies were conducted on 22,683 participants from 11 countries from 2002 to 2018. The age range of the participants was between 5 and 73 years. Of the 23 included, more studies were carried out in the United States (n = 7), SouthKorea (n = 5), and Czech Republic and Japan (n = 2) for each country. The most common

sampling method was census (*n* = 19), and the design of included studies was prospective cross-sectional (*n* =14), respectively. Data were collected in most studies (*n* = 21) between 2000 and 2015. The time ofdata collection was not mentioned in two studies. PONV was recorded and reported based on standard forms after the surgery. PONV was recorded and reported in most studies (*n* = 17) within 24 h of surgery. It was also reported in the recovery room (RR) in six studies and 48 hpostoperatively in three studies. Regarding the type of surgery, patients with any type of surgery were included in the study in most studies (*n* = 11). Regarding the consequences examined, PONV was specifically reported in most studies (*n* = 19). Nausea and vomiting were reported separately in 11 and 12 studies, respectively. Most studies (*n* = 22) had low bias risk The prevalence of PONV, nausea, and vomiting was 27.7%, 31.4%, and 16.8%, respectively. The prevalence of PONV washigher during the first 24 h in European countries.

MATERIALS AND METHODS

Ethical committee and consent

Institutional ethical committee clearance and written informed consent was obtained.

Study design, period, setting and population

This hospital based longitudinal observational study was conducted between December 2019 to September 2021 in Shri B.M Patil medical college, hospital and research Centre, Vijaypur. Department of anaesthesiology, B.L.D.E (Deemed to be university). Patients aged between 18-60 years of either sex, with ASA status of I and II and undergoing laparoscopic surgeries were included in the study.

Sample size:

Considering, the approximate mean time (± SD) to recovery as 12 ± 5.7 and 16.4 ± 6.9 minutes for modified Aldrete score (MAS) and fast-track criteria (FTC) respectively (as per previous literature [2]); the study would require a sample size of 40 per each group (i.e., a total sample size of 80) to achieve a power of 80% and level of significance of 2% for detecting the difference in means between two groups

Total sample size 40+40=80

Formula used

- **$n= (z_\alpha+z_\beta)^2\ 2\ S^2 / MD^2$**

Where Z= Z statistic at a level of significance

MD= Anticipated difference between two proportions

- **Statistical analysis**: Numerical variables will be presented as Mean ±SD, and categorical variables will be presented as frequency (%) and diagrams

- Comparison of numerical variables between groups will be found using unpaired test/ Mann Whitney U test, and categorical variables by Chi square or Fisher's Exact test.

INCLUSION CRITERIA:

- Adult patients aged between 18-60 years of either sex for elective laparoscopic surgeries.

- Patients belonging to ASA Grade I and II.

EXCLUSION CRITERIA:

- Cases where laparoscopic surgery got converted to open surgery
- Surgeries lasting for more than 3 hours
- Pregnancy
- Patients' refusal for procedure
- Patients with known cardiac, renal, hepatic, neurological disorders or any serious medical conditions that would interfere with cardiovascular response assessment.

METHODOLOGY:

Preliminaries:

- Written informed consent will be taken.
- Nil per oral status will be confirmed.
- Intravenous access will be secured with a 20 gauge I.V cannula.

Pre-anaesthetic evaluation:

During preoperative visit patient's detailed history, general physical examination and systemic examination will be carried out. History of any significant medical illness will be elicited. Airway, respiratory system and cardiovascular system will be assessed.

Only ASA grade I and II patients within the age group of 18 to 60 years of either sex undergoing laparoscopic surgeries will be included in our study.

INVESTIGATIONS INCLUDE:

- Routine blood-haemoglobin(Hb%), total count (TC), differential count (DC), Bleeding time, Clotting Time.
- Fasting blood sugar, Blood urea, serum creatinine.
- Chest X-ray and ECG if indicated.
- HIV and HbsAg.

PROCEDURE:

Socio-demographic details of the patient will be noted. Patient will be shifted to operation table, IV access will be obtained on forearm with 20 Gauge IV canula and Ringer's lactate solution 10ml/kg/hr. will be infused intravenously. Baseline heart rate, mean arterial pressure, oxygen saturation, and respiratory rate will be noted. Inj Midazolam 0.08 mg/kg IV, Inj. Glycopyrrolate 0.008 mg/kg IV and Inj. Ondansetron 0.15 mg/kg IV will be used as premedication. Subjects will be pre-oxygenated, Inj. Fentanyl 1mcg/kg IV will be given as analgesic and induction will be performed using IV Propofol 1.5mg/kg IV. Tracheal intubation will be performed after inj. Atracurium 0.5 mg/kg IV Anaesthesia will be maintained with oxygen, nitrous oxide & Isoflurane. Neostigmine 2.5 mg IV and Glycopyrrolate 0.5 mg IV will be used for reversal of Neuromuscular blockade.

Recovery of all enrolled patients will be assessed using either modified Aldrete score or fast-track criteria. The scores will be recorded every 5 minutes until 30 minutes after tracheal extubation. The time point of attainment of a score of ≥ 9 according to MAS and ≥ 12 according to FTC recorded. The scores will also be recorded at 2, 6, 12 and 24 hours following tracheal extubation.

Pharmacology

Midazolam: Midazolam is a short-acting benzodiazepine in adults with an elimination half-life of 1.5–2.5 hours. In extremes of ages, the elimination half-life is longer. Midazolam is metabolized into an active metabolite alpha1-hydroxymidazolam. Age-related deficits, renal and liver status affect the pharmacokinetic factors of midazolam as well as its active metabolite. However, the active metabolite of midazolam is minor and contributes to only 10 percent of biological activity of midazolam. Midazolam is metabolized by cytochrome P450 (CYP) enzymes and by glucuronide conjugation. The therapeutic as well as adverse effects of midazolam are due to its effects on the $GABA_A$ receptors; midazolam does not activate $GABA_A$ receptors directly but, as with other benzodiazepines, it enhances the effect of the neurotransmitter GABA on the $GABA_A$ receptors (↑ frequency of Cl^- channel opening) resulting in neural inhibition. Almost all of the properties can be explained by the actions of benzodiazepines on $GABA_A$ receptors. This results in the following pharmacological properties being produced: sedation, induction of sleep, reduction in anxiety, anterograde amnesia, muscle relaxation and anticonvulsant effects.

Fentanyl: It is a synthetic opioid and belongs to phenylpiperidine family, which act on G-protein coupled receptors. As a μ-receptor agonist, fentanyl binds 50 to 100 times more potently than morphine. It can also bind to the delta and kappa opioid receptors but with a lower affinity. It has high lipid solubility, allowing it to more easily penetrate the central nervous system. Fentanyl produces following clinical effects strongly through μ-receptor agonism viz., analgesia, sedation

and suppression of cough reflex. Fentanyl's most common side effects, which affect more than 10% of people, include nausea, vomiting, constipation, dry mouth, somnolence, confusion, and asthenia (weakness).

Propofol: It is a short-acting medication that results in a decreased level of consciousness and a lack of memory for events. Propofol has been proposed to have several mechanisms of action, both through potentiation of $GABA_A$ receptor activity and therefore acting as a $GABA_A$ receptor positive allosteric modulator, thereby slowing the channel-closing time. At high doses, propofol may be able to activate $GABA_A$ receptors in the absence of GABA, behaving as a $GABA_A$ receptor agonist as well. Common side effects of propofol include an irregular heart rate, low blood pressure, a burning sensation at the site of injection and the cessation of breathing.

Propofol is commonly used for the induction and maintenance of GA. Total intravenous anaesthesia (TIVA) with propofol reduces the incidence of PONV. propofol is associated with a lower incidence of PONV than inhalational anaesthesia. Propofol may act by reducing 5-HT levels in the area postrema. However, propofol given for induction alone has no relevant effect on PONV. This has led to a suggestion that the difference between propofol and volatile anaesthesia is caused mainly by the emetogenic effects of volatile anaesthetics, rather than by the antiemetic effect of propofol.The use of patient-controlled antiemesis with sub-hypnotic doses of propofol may also effectively reduce the incidence of PONV with a high level of patient satisfaction.

Isoflurane: It can be used to start or maintain anesthesia, (however airway irritation is associated with isoflurane). Isoflurane is given via inhalation. Isoflurane reduces pain sensitivity (analgesia) and relaxes muscles. Isoflurane likely binds to GABA, glutamate and glycine receptors, but has different effects on each receptor. Isoflurane acts as a positive allosteric modulator of the GABAA receptor in electrophysiology studies of neurons and recombinant receptors. It potentiates glycine receptor activity, which decreases motor function. It inhibits receptor activity in the NMDA glutamate receptor subtypes. Isoflurane inhibits conduction in activated potassium channels. Isoflurane also affects intracellular molecules. It activates calcium ATPase by increasing membrane fluidity. It binds to the D subunit of ATP synthase and NADH dehydrogenase. Side effects of isoflurane include a decreased ability to breathe (respiratory depression), low blood pressure, and an irregular heartbeat.

Nitrous oxide: Nitrous oxide is an odorless, colorless, non-flammable gas. While nitrous oxide is not flammable, it will support combustion to the same extent as oxygen does. It leads to a state of euphoria explaining its nickname 'laughing gas.' Nitrous oxide is the least potent inhalational anesthetic. Nitrous oxide requires a concentration of 104% to reach one minimum alveolar concentration (MAC). Thus, it cannot be a sole anesthetic agent, and it is often

combined with a more potent and volatile anesthetic. The combination of analgesic and anesthetic effects make nitrous oxide a valuable adjunct. Nitrous oxide has a low blood solubility (blood-gas partition coefficient of 0.47), leading to a quick onset and offset. The low solubility leads to a concentrating effect for additionally administered volatile agents in the lungs and is known as the second gas effect.

Nitrous oxide's potent analgesic properties can be useful in providing analgesia in settings such as the obstetrical ward or emergency department. In these settings, its administration is often as a 50% mixture with oxygen.

Compared to other anesthetic agents, nitrous oxide causes minimal effects on respiration and hemodynamics. It leads to decreased tidal volume and increased respiratory rate but has a minimal impact on overall minute ventilation. Nitrous oxide leads to direct myocardial depression, but nitrous oxide's sympathetic stimulation reduces this effect and the net effect is

minimal. Unlike other volatile anesthetics, nitrous oxide has no muscle relaxation properties.Nitrous oxide has multiple supraspinal and spinal targets. The anesthetic effect of nitrous oxide is through non-competitive NMDA inhibition in the central nervous system. The analgesic effects occur through the release of endogenous opioids that act on opioid receptors; its analgesic actions are like morphine. The anxiolytic effects are through GABA-A activation. Nitrous oxide has a central sympathetic stimulating activity that supports blood pressure, systemic vascular resistance, and cardiac output. Nitrous oxide stimulates cerebral blood flow and increases intracranial pressure. Significant adverse effects include Respiratory depression, diffusion hypoxia and Postoperative Nausea Vomiting (PONV). N2O stimulates the vomiting centre directly and interacts with opioid receptors, the sympathetic nervous system and peripheral pathways. It causes distension of air spaces in the middle ear, stomach and small and large intestines there is a higher incidence of PONV with the use of N2O.The use of volatile anaesthetics during general anaesthesia (GA) is a strong risk factor for the development of postoperative vomiting which is restricted to the first 2 hours post-operation and also depended on the duration of exposure.

DICLOFENAC SODIUM

Diclofenac sodium is a phenyl acetic acid derivative which is relatively nonselective COX inhibitor. It is one of the most potent NSAIDS. NSAIDS have anti − inflammatory and analgesic effects through the inhibition of prostaglandin synthesis, by blocking the activity of COX.Available in parenteral preparations, oral tablets, ointments, rectal suppositories and transdermal patches. Diclofenac [sodium-0-(2, 6-dichlorophenyl)-aminophenylacetate] is a non steroidal compound with anti-inflammatory, analgesic, anti rheumatic and anti-pyretic properties. When given in high doses diclofenac temporarily inhibits platelet aggregation. Post operatively, diclofenac rapidly relieves pain, inflammation and edema.

TABLE 1 - MODIFIED ALDRETE SCORE

CRITERIA	
1.ACTIVITY	**Score**
Moves all extremities	2
Moves two extremities	1
Unable to move extremities	0
2.RESPIRATION	
Breathes deeply, coughs freely	2
Dyspnoeic, shallow or limited breathing	1
Apnoeic	0
3.CIRCULATION (Blood Pressure)	
20% ± preanaesthetic level	2
20-49% ± preanaesthetic level	1
50% ± preanaesthetic level	0
4.CONSCIOUSNESS	
Fully awake	2
Arousable on calling	1
Not responding	0
5.OXYGEN SATURATION	
spO2>92% on room air	2
Supplemental oxygen requirement to maintain Spo2> 90%	1
SpO2 < 90% with oxygen supplementation	0
Total score (scores obtained in 1+2+3+4+5)	

Total scores of ≥ 9 out of maximum score of 10 is considered optimal to declare total recovery from general anaesthesia.

TABLE 2 - FAST TRACK CRITERIA

CRITERIA	SCORE
1.Level of consciousness	
Awake and oriented	2
Arousable with minimal stimulation	1
Responsive to only tactile stimulation	0
2.Physical Activity	
Able to move all the extremities on command	2
Some weakness in the movements of extremities	1
Unable to voluntarily move extremities	0
3.Haemodynamic stability	
Bloop pressure < 15% of baseline map	2
Blood pressure 15-30% of base line map	1
Blood pressure > 30% below map	0
4.Respiratory stability	
Able to breathe deeply	2
Tachypnoea with good cough	1
Dyspnoeic with weak cough	0
5.Oxygen Saturation	
Maintains value >90% on room air	2
Requires supplemental oxygen (nasal prongs)	1
Saturation <90% with oxygen	0

6.Postoperative pain assessment	
None or mild discomfort VAS ≤ 4	2
Moderate to severe pain controlled on IV analgesics VAS 5-6	1
Persistent severe pain VAS ≥ 9	0
7.Postoperative emetic symptoms	
None or mild nausea with no active vomiting	2
Transient vomiting or retching	1
Persistent moderate to severe nausea and vomiting	0
Total score (scores obtained in 1+2+3+4+5+6+7)	

A total score of ≥ 12 out of maximum score of 14 in fast-track criteria is considered optimal to declare total recovery after general anaesthesia

SPEED criteria

By the mnemonic "SPEEDS" (saturation, pain, extremity movement, emesis, dialogue, stable vital signs) to evaluate and predict which patients would not require phase I nursing intervention and could transition to phase II recovery.

PAIN ASSESSMENT SCALES:

Pain is a complex and subjective experience. The evaluation of pain is the vital precondition for effective pain management. Deciding the initial medication plan is helpful, but also revaluating the degree of accomplishment. This treatment and reassessment cycle will continue until a good result has been achieved. (19) In the immediate postoperative period, physiological responses such as pulse rate, blood pressure, respiratory rate are important indicators of pain.

Visual analogue scale: It is 10 cm scale with end points labelled 0 for NO PAIN and

10 for WORST POSSIBLE PAIN. The person was asked to compare the severity of

current pain with worst pain he ever faced in his life. (19)

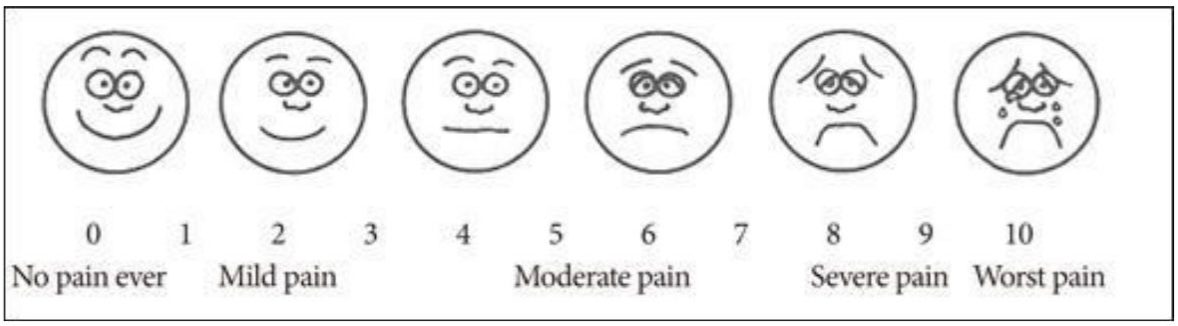


Figure 1: Visual Analogue Scale

Visual Rating Scale (Prince Henry Scale): Scores Severity of Pain

1 No pain on coughing

2 Pain on coughing or movements but not on deep

3 Pain on deep breathing but not on rest

4 Slight pain at rest

5 Severe pain at rest

Numerical rating: With the two anchors of NO PAIN and AGONISING PAIN, it is comparable to the visual analogue scale, but it has numbers across the scale from 0- 10. This scale needs the patient to realize how their severity of pain can be translated into number. It is less sensitive in calculating the intensity of small changes. (19)

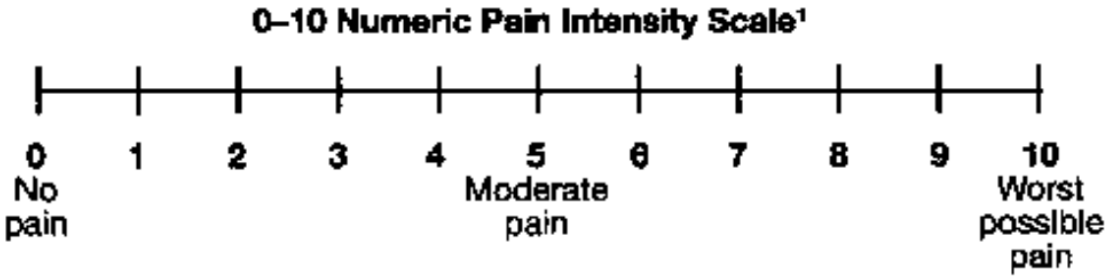


Figure 2: Numerical Rating Scale

ACUTE POSTOPERATIVE PAIN

Management of acute postoperative pain by anaesthesiologists is improving as the knowledge regarding dose ranges; duration of action is being widely studied across the globe.

Factors that modify postoperative pain-

1. The site, nature and duration of surgery.

2. The type and extent of the incision.

3. The physiological and psychological makeup of the patient.

4. Preoperative preparation of patient

5. Anaesthetic management before, during and after surgery

6. Postoperative care

Methods adopted for postoperative pain relief:

1. By increasing the pain threshold

Pharmacologic- centrally and peripherally acting analgesics

Non-pharmacologic-counselling

2. By modulating the pain pathways

a. TENS

b. Acupuncture

c. Cryotherapy

d. Heat therapy

By interrupting the nociceptive pathway

a. Nerve blocks and neurolysis

b. Surgical ablation .

POSTOPERATIVE NAUSEA AND VOMITING

The estimated overall incidence of PONV for all surgeries and patient populations is between 25% and 30%, with severe, intractable PONV estimated to occur in approximately 0.18% of all patients. In high-risk groups, PONV occurs in as many as 70% of patients. Despite advances in surgical techniques and the introduction of less emetogenic anaesthetic techniques and drugs, PONV remains an important cause of delayed discharge from the recovery room and decreased patient satisfaction. It is also associated with complications such as tension on suture lines, wound bleeding and dehiscence, increased intracranial pressure, pulmonary aspiration, dehydration and electrolyte imbalance. The aetiology of PONV is multifactorial, involving patient, medical, surgery and anaesthesia related factors. Patient-related Factors Patient-related risk factors are beyond our control and it becomes imperative to identify them during the preoperative anaesthesia evaluation. They include age, gender, history of motion sickness or PONV, and smoking history.Some patients may have coexisting medical problems, such as gastrointestinal diseases (hiatus hernia, gastrooesophageal reflux) and metabolic diseases (diabetes mellitus, uraemia, electrolyte abnormalities), that may predispose them to PONV. Pregnancy and preoperative anxiety also increase the risk of PONV. The underlying surgical problem for which the patient is undergoing surgery, such as intracranial stimulation (raised intracranial pressure from tumours) and sensory stimulation from acute abdomen, intestinal obstruction etc., can also initiate the vomiting reflex.Surgery-related Causes Certain types of surgery are associated with a higher risk of PONV. Otolaryngological surgery, dental surgery, breast augmentation surgery, orthopaedic shoulder surgery, laparoscopy, strabismus surgery and varicose vein stripping were found to have a higher incidence of PONV than other procedures. Long operations increase the exposure time to potentially emetogenic anaesthetic drugs and are

associated with a higher risk of PONV. Anaesthesia-related Causes While anaesthetists have little control over surgical factors, they do have control over factors such as premedication, anaesthetic technique, choice of anaesthetic drugs [nitrous oxide, volatile anaesthetics, intravenous (IV) agents, opioids and reversal agents], IV hydration and postoperative pain management. A >35% reduction in systolic blood pressure during anaesthesia, and especially during induction, has been associated with an increased incidence of PONV.With a better understanding of the contributing factors of PONV various risk prediction tools to were created to stratify patients into high-, medium- and low-risk groups for PONV. Logistic regression analysis is used to quantify the relative impact of patient, anaesthetic and surgical factors to predict PONV.

A simplified risk score for predicting postoperative nausea and vomiting[19] [Apfel etal]

A risk-stratification method created by Apfel *et al* has been developed to determine a patient's risk for PONV. The presence of 0, 1, 2, 3, or 4 of any of the following risk factors corresponds to a PONV respective risk of 10, 20, 40, 60, and 80%.

- Female gender
- Non-smoking
- History of PONV or motion sickness
- Expectant use of postoperative opioid medications

In addition to these age, nature of surgery and duration and type of anaesthesia intraoperative opioid administration and intraoperative use of N2 O were associated with an increased risk of PONV. On the other hand, the use of IV propofol had a protective effect.

Table 3 - Post anaesthesia care unit (PACU)

Role of Anaesthesia professional in Phase I and II

Level of care	Priorities	Possible complications	Discharge from phase considerations
Phase I	• Stable airway with adequate ventilation and oxygenation • Hemodynamic stability • Manage analgesia and PONV • Oral intake • Discontinue or adapt IV (enhanced recovery protocol)	• Airway compromise • Cardiovascular depression • Pain • Side effects: o Nausea o Vomiting • Delirium • Procedure-specific considerations	• Adequate airway and ventilatory status • Cardiac and hemodynamic stability • Ability to move extremities on command • Fully awake • Adequate oxygen saturation on room air
Phase II	• Mobility • Oral intake	• Pain • Nausea	Adequate pain relief and comfort

	• Adequate analgesia • Education for discharge • Prescriptions	• Vomiting	• Hemodynamic stability • Nausea addressed • Takes fluids • Ambulates • Understands discharge instructions, medications and management of any issues • Safe transportation from the facility

Extended Care: Extended care, otherwise known as Phase III, occurs in the same physical location as care provided to Phase I and Phase II patients. This phase is for patients who have met criteria to leave Phase I, but are not able to go to another location (e.g., there are no available inpatient beds). These patients are assessed and managed as inpatients.

RESULTS AND ANALYSIS

References for Statistical Methods:

Dakhale GN, Hiware SK, Shinde AT, Mahatme MS.[20]Basic biostatistics for post-graduate students. Indian J Pharmacol. 2012;44(4):435-442.

Sunder Rao P S S , Richard J[21]: An Introduction to Biostatistics, A manual for students in health sciences , New Delhi: Prentice hall of India. 4th edition. 2006; 86-160.

Elenbaas, RM, Elenbaas, JK, Cuddy, PG[23]. Evaluating the medical literature, part II: Statistical analysis.Ann Emerg Med. 1983;12:610–620.

Statistical analysis:

Data was entered into Microsoft excel data sheet and was analyzed using SPSS 22 version software. Categorical data was represented in the form of Frequencies and proportions. **Chi-square test** was used as test of significance for qualitative data. Continuous data was represented as mean and standard deviation. **Independent t test** was used as test of significance to identify the mean difference between two quantitative variables and qualitative variables respectively.

Graphical representation of data: MS Excel and MS word was used to obtain various types of graphs such as bar diagram and line diagram.

p value (Probability that the result is true) of <0.05 was considered as statistically significant after assuming all the rules of statistical tests.

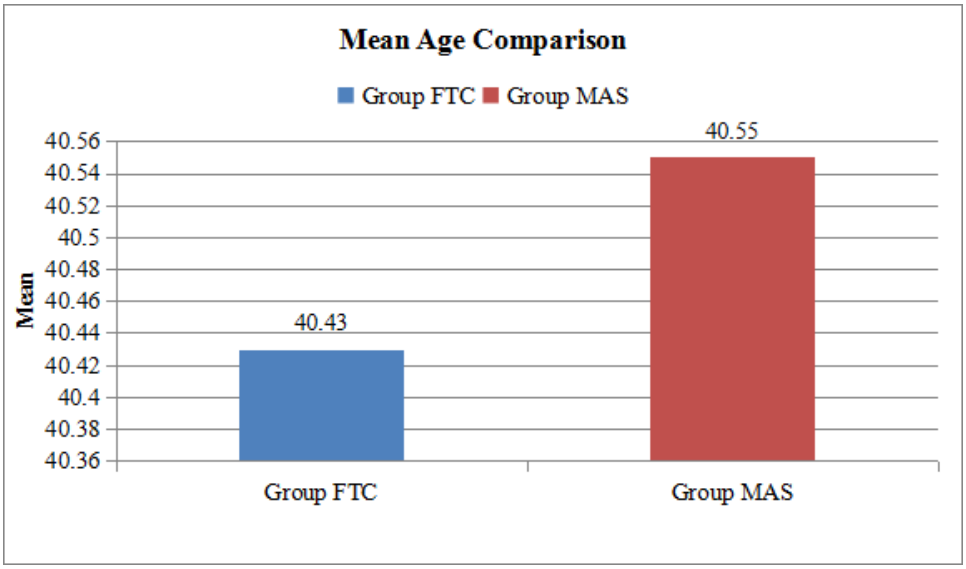
Statistical software: MS Excel**,** SPSS version 22 **(**IBM SPSS Statistics, Somers NY, USA) was used to analyze data.

RESULTS

Table 4: Mean Age Comparison between two groups

Age	Group				p value
	Group FTC		Group MAS		
	Mean	SD	Mean	SD	0.965
	40.43	13.08	40.55	12	

Mean Age in Group FTC was 40.43 ± 13.08 and in Group MAS was 40.55 ± 12. There was no significant difference in mean Age comparison between two groups.



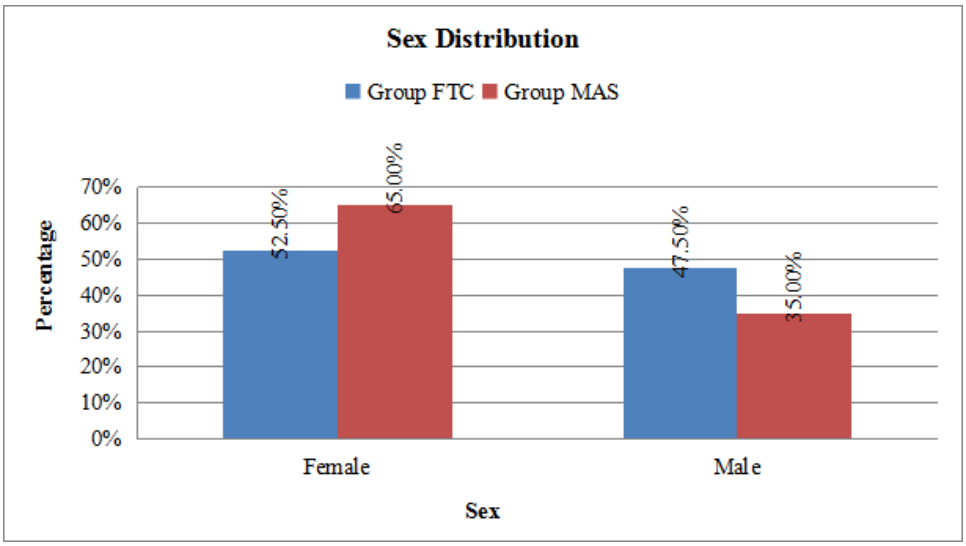
Graph 1: Bar Diagram Showing Mean Age Comparison between two groups

Table 5: Sex Distribution between two groups

SEX		Group				P value
		Group FTC		Group MAS		
		Count	%	Count	%	
	Female	21	52.50%	26	65.00%	0.256
	Male	19	47.50%	14	35.00%	

$\chi 2 = 1.289$, df = 1, p = 0.256

There was no significant difference in sex distribution between two groups.

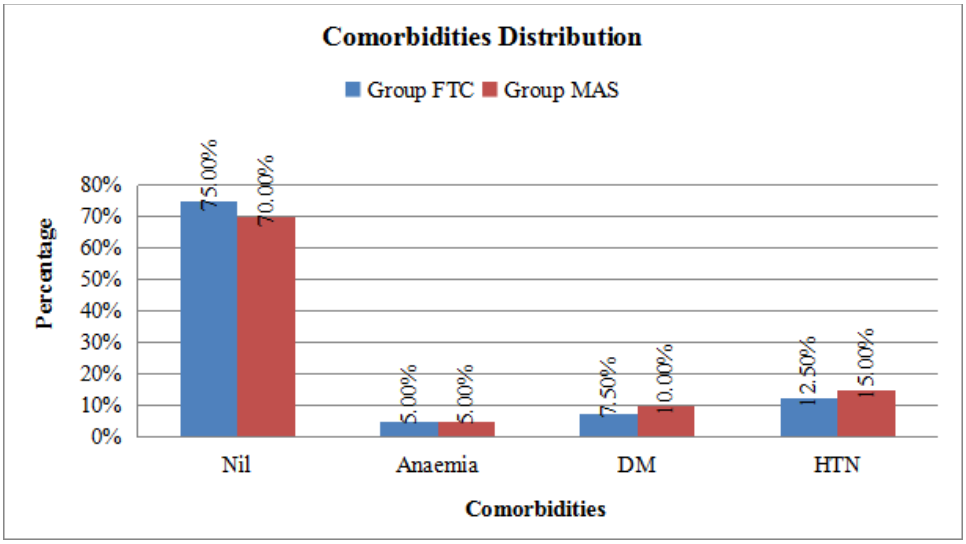


Graph 2: Bar Diagram Showing Sex Distribution between two groups

Table 6: Comorbidities Distribution between two groups

COMORBIDITIES	Group				P Value
	Group FTC		Group MAS		
	Count	%	Count	%	
Nil	30	75.00%	28	70.00%	0.960
Anaemia	2	5.00%	2	5.00%	
DM	3	7.50%	4	10.00%	
HTN	5	12.50%	6	15.00%	

$\chi 2 = 0.303$, df = 3, p = 0.960

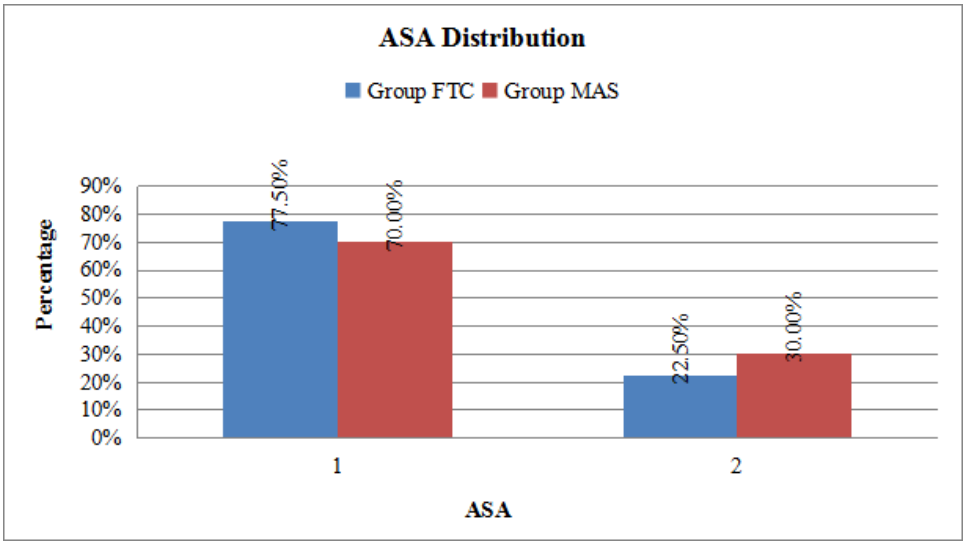


Graph 3: Bar Diagram Showing Comorbidities Distribution between two groups

Table 7: ASA Grade Distribution between two groups

ASA GRADE	Group			
	Group FTC		Group MAS	
	Count	%	Count	%
1	31	77.50%	28	70.00%
2	9	22.50%	12	30.00%

$\chi 2 = 0.581$, df = 1, p = 0.446

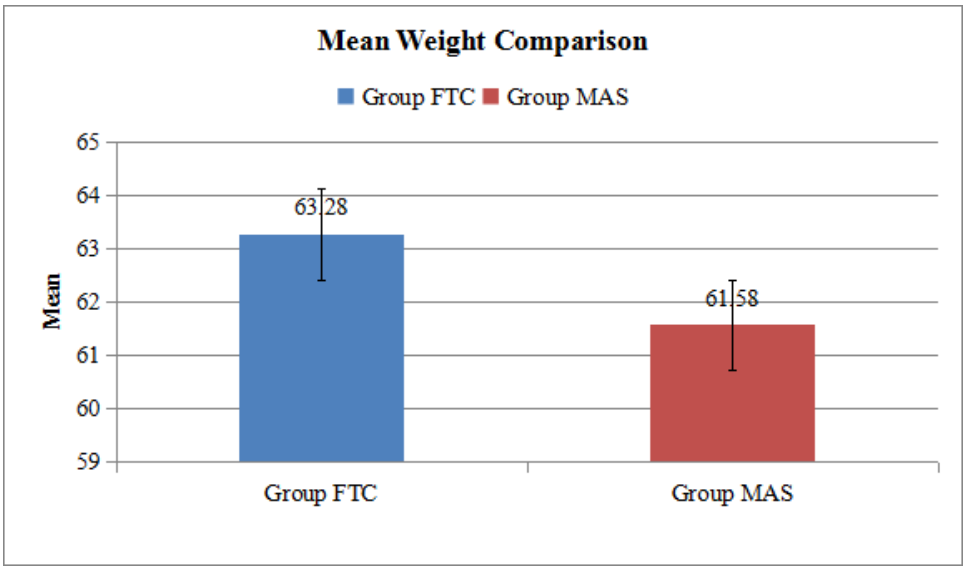


Graph 4: Bar Diagram Showing ASA Distribution between two groups

Table 8: Mean Weight Comparison between two groups

	Group				p value
Weight	Group FTC		Group MAS		
	Mean	SD	Mean	SD	0.514
	63.28	13.19	61.58	9.76	

Mean Weight in Group FTC was 63.28 ± 13.19 and in Group MAS was 61.58 ± 9.76. There was no significant difference in mean Weight comparison between two groups.

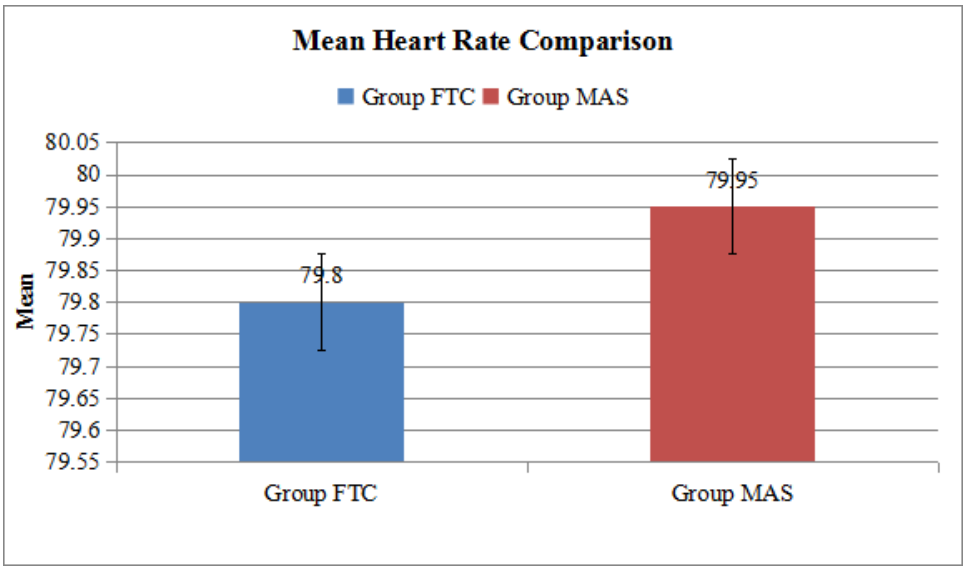


Graph 5: Bar Diagram Showing Mean Weight Comparison between two groups

Table 9: Mean HR Comparison between two groups

	Group				p value
HR	Group FTC		Group MAS		
	Mean	SD	Mean	SD	0.926
	79.8	8.02	79.95	6.22	

Mean HR in Group FTC was 79.8 ± 8.02 and in Group MAS was 79.95 ± 6.22. There was no significant difference in mean HR comparison between two groups.

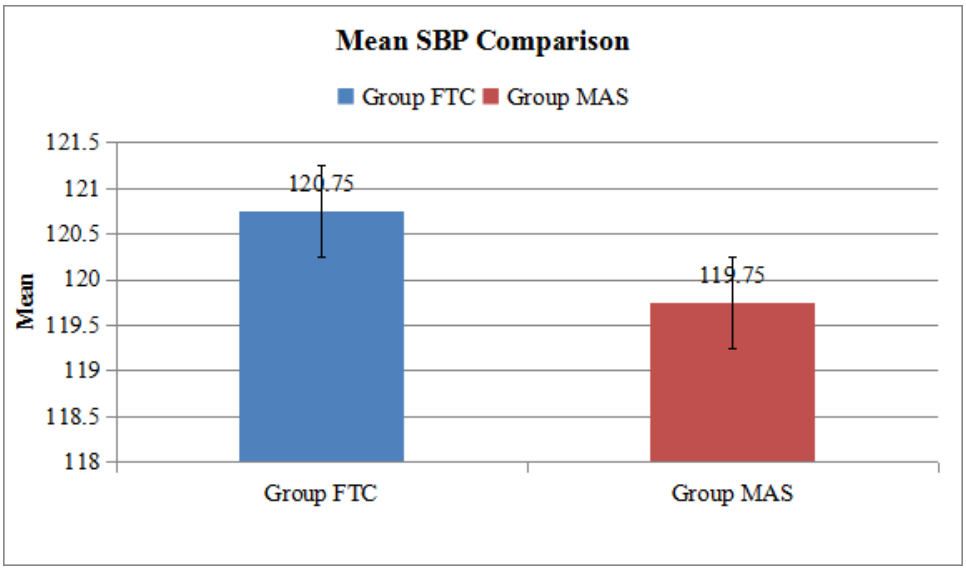


Graph 6: Bar Diagram Showing Mean Heart Rate Comparison between two groups

Table 10 : Mean SBP Comparison between two groups

	Group				p value
SBP	Group FTC		Group MAS		
	Mean	SD	Mean	SD	0.721
	120.75	10.71	119.75	14.05	

Mean SBP in Group FTC was 120.75 ± 10.71 and in Group MAS was 119.75 ± 14.05. There was no significant difference in mean SBP comparison between two groups.

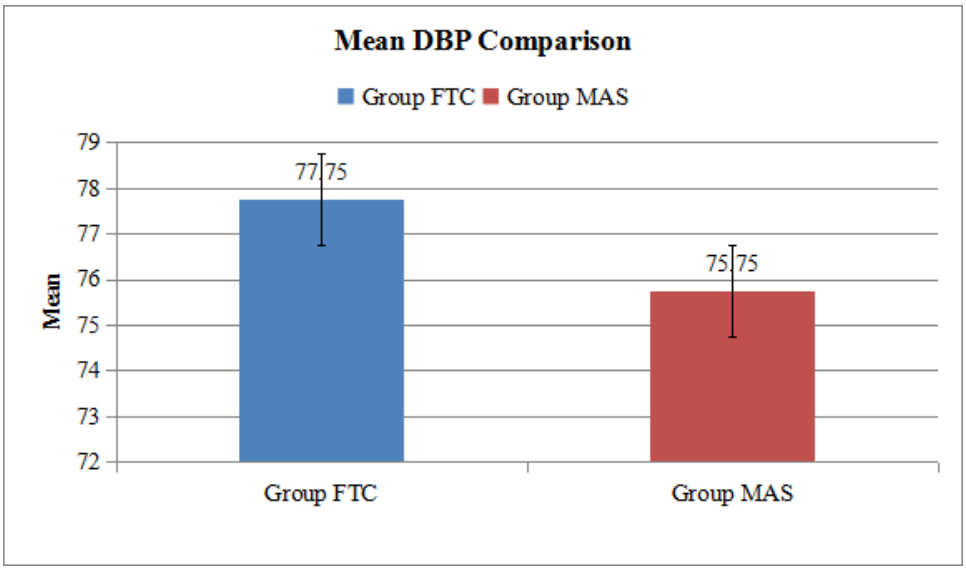


Graph 7: Bar Diagram Showing Mean SBP Comparison between two groups

Table 11: Mean DBP Comparison between two groups

	Group				p value
	Group FTC		Group MAS		
DBP	Mean	SD	Mean	SD	0.28
	77.75	7.68	75.75	8.74	

Mean DBP in Group FTC was 77.75 ± 7.68 and in Group MAS was 75.75 ± 8.74. There was no significant difference in mean DBP comparison between two groups.

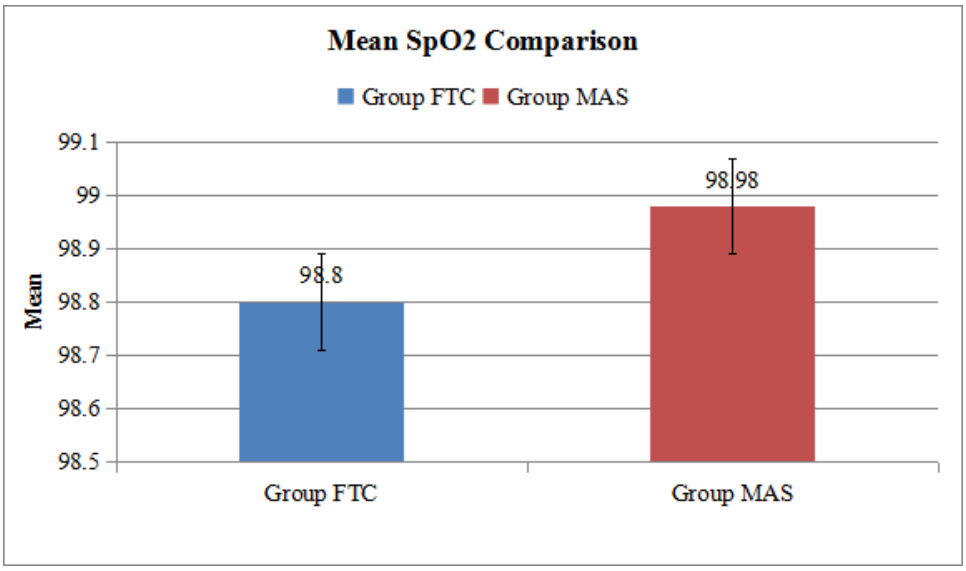


Graph 8: Bar Diagram Showing Mean DBP Comparison between two groups

Table 12: Mean SpO2 Comparison between two groups

	Group				p value
	Group FTC		Group MAS		
SpO2	Mean	SD	Mean	SD	0.462
	98.8	0.97	98.98	1.14	

Mean SpO2 in Group FTC was 98.8 ± 0.97 and in Group MAS was 98.98 ± 1.14. There was no significant difference in mean SpO2 comparison between two groups.

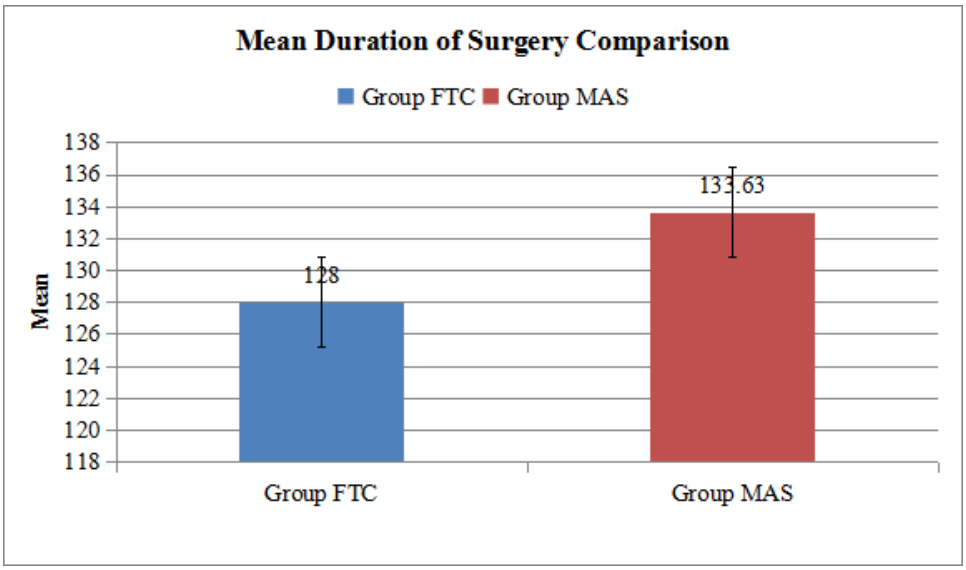


Graph 9: Bar Diagram Showing Mean SpO2 Comparison between two groups

Table 13: Mean Duration of Surgery Comparison between two groups

	Group				p value
Duration of Surgery	Group FTC		Group MAS		0.419
	Mean	SD	Mean	SD	
	128	31.94	133.63	29.91	

Mean Duration of Surgery in Group FTC was 128 ± 31.94 and in Group MAS was 133.63 ± 29.91. There was no significant difference in mean Duration of Surgery comparison between two groups.



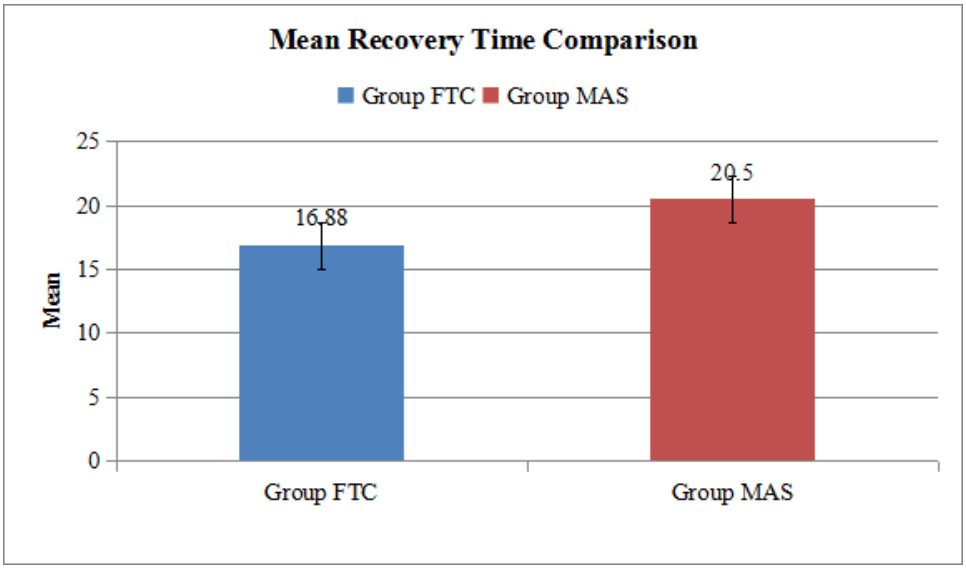
Graph 10: Bar Diagram Showing Mean Duration of Surgery Comparison between two groups

Table 14: Mean Recovery Time Comparison between two groups

	Group				p value
Recovery Time	Group FTC		Group MAS		
	Mean	SD	Mean	SD	0.011*
	16.88	6.951	20.5	5.41	

Mean Recovery Time in Group FTC was 18.25 ± 6.94 and in Group MAS was 20.5 ± 5.41. There was significant difference in mean Recovery Time comparison between two groups.

Recovery was fast in FTC group compared to MAS group.



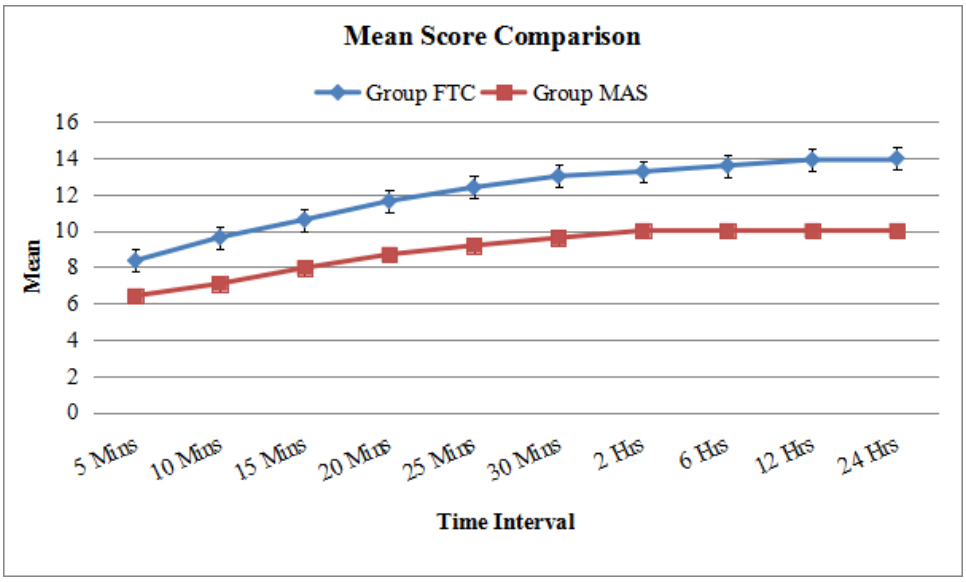
Graph 11: Bar Diagram Showing Mean Recovery Time Comparison between two groups

Table 15: Mean score Comparison between two groups at different intervals of time

TIME DURATION AFTER EXTUBATION	Group				p value
	Group FTC		Group MAS		
	Mean	SD	Mean	SD	
5 Mins	8.35	1.61	6.41	1.04	< 0.001*
10 Mins	9.63	1.92	7.08	1.01	< 0.001*
15 Mins	10.6	1.81	7.95	0.89	< 0.001*
20 Mins	11.63	1.46	8.69	0.66	< 0.001*
25 Mins	12.38	0.98	9.18	0.71	< 0.001*
30 Mins	13	0.85	9.6	0.5	< 0.001*
2 Hrs	13.25	0.67	10	0	< 0.001*
6 Hrs	13.58	0.59	10	0	< 0.001*
12 Hrs	13.9	0.44	10	0	< 0.001*
24 Hrs	13.98	0.16	10	0	< 0.001*

At all intervals there was a significant difference in modified Aldrete score between two groups.

Group FTC has higher Score compared to Group MAS.



Graph 12: Line Diagram Showing Mean Score Comparison between two groups at different intervals of time

DISCUSSION

In my study,a total of 80 patients undergoing laparoscopic surgery were observed for post operative recovery according to either MAS or the FTC criteria.The Mean Age in Group FTC was 40.43 ± 13.08 and in Group MAS was 40.55 ± 12. There was no significant difference in mean Age comparison between two groups. As the age distribution in my study was comparable and with no statistical significance (P-value:0.965), allowed to conduct the study without deviating from the primary and secondary objectives.

Sex distribution was also comparable in both groups, with 26 females and 14 males in MAS group, whereas it was 21 females and 19 males in FTC group.

Majority of the patients, both groups included had no co-morbidities, who accounted to 28/40(75%) in MAS group and 30/40 in FTC group (75%). The commonly seen co-morbidities in my study are HTN, DM and Anemia. Subjects with HTN, DM and Anemia in MAS group were 6, 4 and 2 respectively, whereas in FTC group were 5,3 and 2 respectively. There was no statistically significant difference with respect to co-morbidities in MAS and FTC criteria.

The ASA grade of subjects in my study is 1 and 2. Majority were Grade 1 in MAS and FTC group, 28 and 31 respectively. Rest of the subjects had ASA Grade 2, 12 in MAS and (in FTC group.

Mean Weight in Group FTC was 63.28 ± 13.19 and in Group MAS was 61.58 ± 9.76. There was no significant difference in mean Weight comparison between two groups showed no statistical significance (P-value: 0.514)

Mean HR in Group FTC was 79.8 ± 8.02 and in Group MAS was 79.95 ± 6.22. There was no significant difference in mean HR comparison between two groups. (P-value:0.926).

Mean SBP in Group FTC was 120.75 ± 10.71 and in Group MAS was 119.75 ± 14.05. There was no significant difference in mean SBP comparison between two groups. (P-value:0.72).

Mean DBP in Group FTC was 77.75 ± 7.68 and in Group MAS was 75.75 ± 8.74. There was no significant difference in mean DBP comparison between two groups. (P-value:0.28).

Mean SpO2 in Group FTC was 98.8 ± 0.97 and in Group MAS was 98.98 ± 1.14. There was no significant difference in mean SpO2 comparison between two groups. (P-value:0.462).

Mean Duration of Surgery in Group FTC was 128 ± 31.94 and in Group MAS was 133.63 ± 29.91. There was no significant difference in mean Duration of Surgery comparison between two groups.

Mean Recovery Time in Group FTC was 18.25 ± 6.94 and in Group MAS was 20.5 ± 5.41. There was significant difference in mean Recovery Time comparison between two groups (P-value:0.011*). Hence patients can be moved to recovery area by 18.25 ± 6.94 according to FTC criteria and 20.5 ± 5.41 according to MAS criteria.There is a delay of 2.25 to move the patient to recovery according to MAS.

Tracheal extubation times for each patient belonging to both the groups (MAS and FTC) were noted down and recovery scores were calculated every 5 mins until 30 mis post extubation and at 2,4,6,12 and 24 hrs post extubation.

The requirement of rescue analgesia and antiemetics were observed post operatively in patients assessed with FTC criteria.It is observed that almost all patients were pain free during first 30 mins post extubation due to the analgesic effect of intraoperative anaesthetic and analgesic agents. 5% of the patients in the FTC group required rescue analgesic 1.5 hrs post surgery,17.5%

patients required 2.5 hrs after surgery,30 % of the patients in the FTC group required rescue analgesia in 4 hr-6 hr time interval post extubation.

10% of the patients in the FTC group complained of PONV and required Antiemetic in 2hr-4 hr time interval post extubation and 12.5% required antiemetic 6 hrs post extubation.These post operative symptoms caused a dip in the FTC scores in 12.5% of the patients around 4hr-6 hr time interval post extubation in the patients of FTC group

From our study, both modified Aldrete score and fast-track criteria seem good for assessing recovery in immediate post-op period in this setting. However, given that FTC additionally documents the PONV and post-operative pain, it should be given a higher preference to MAS as a tool, to be used to document adequate recovery and transfer of patient from PACU /high dependency unit (HDU) to the general ward.

Older age, pre- operative medication with fentanyl and midazolam administered together compared to midazolam alone and longer duration of surgery, are factors which can significantly prolong time to recovery from general anaesthesia. Pain and PONV in the postoperative period increase morbidity and can affect recovery scores particularly during 2 to 12 hours of extubation.

White et al in 1999[2] compared modified Aldrete score and fast-track criteria in 216 female patients in Southwestern Medical Center at Dallas, Texas, to evaluate the time to recovery in 3 separate groups where desflurane, sevoflurane and propofol were used as induction anaesthetic and recovery status was noted at 1-minute intervals using both the MAS and FTC scoring system. In the propofol group, White et al noted the mean difference in time to recovery to be 1.2 minutes when assessed by MAS and FTC. In our study, this difference was found to be 2.25

minutes. Most of the surgeries in the study by White et al comprised of laparoscopic tubal ligation, whereas in our study it was laparoscopic cholecystectomy (35/80).

Delayed recovery from anaesthesia is associated with various factors. Older age has been reported to be an important risk factor for delayed recovery in several studies [Awad IT etal, Sinclair etal, Misal US etal, Frost EA etal 9-12] which can be explained by the physiological changes in elderly where metabolism of drugs is prolonged leading to delayed recovery. In relation to use of pre-medications, Sinclair et al [10] observed that midazolam and alfentanil share P450 isoenzyme for metabolism and when administered together, the half-lives and clinical effects of both the drugs are prolonged leading to a delayed recovery. Our study results support this observation.

Laparoscopic Hysterectomy was the longest surgical procedure (mean duration 133.26 +/- 30.5 minutes) in our hospital settings compared to laparoscopic hernioplasty (mean duration 132.62 +/- 31.74 minutes) or laparoscopic appendicectomy (mean duration 131.93 +/- 31.12 minutes) and these patients had longer times to recovery. In agreement to our findings, previous studies [Song D etal, Awad IT etal, Strum EM etal 5,9,13], also reported a significant linear association between the prolonged duration of surgery and delayed time to recovery which is explained by the cumulative effect of the anesthetic drugs where surgeries are of long duration. It is known pre-operative co-morbidities like diabetes, ischemic heart disease, congestive heart failure and sleep apnea can delay recovery from general anaesthesia[9].

However, in our study, co-morbidities were not found to be a significant factor in the multivariable regression analysis. This may be because of the stringent inclusion criteria where we have included only subjects with ASA grade I & II, and thereby excluding subjects with severe functional limitation due to systemic illness and is a limitation of the study.

In the present study, all patients were relatively pain free for the first 30 minutes after surgery which is explained by the analgesic effect of the anaesthetic drugs and administration of IV analgesics which was administered in the intraoperative phase. Increase in pain scores (VAS) were first noted 1.5 hours after surgery. Mild nausea and vomiting were noted at all-time points of observation, during the 24 hours post-operative period. The incidence of persistent moderate to severe PONV and persistent severe pain (VAS>=9) in the participants during the 2–4 hour post- operative period affected the fast-track criteria scores and a corresponding dip in the FTC scores were observed. This did not affect modified Aldrete scores, as it has no provision to document pain or PONV. The findings are supported by reports of previous studies which suggest post-operative pain and PONV remains a major factor delaying recovery and prolonging hospital stay [Chung F 99etal, Pavlin DJ etal, Awad IT etal, Wu CL etal 7-9,14]. Use of longer acting anti-emetics and analgesics may prevent the PONV and pain during the time period when incidence of the same is high. This will hasten the recovery process and avoid the expenses related to prolonged PACU stay, thereby reducing the overall costs. FTC can be of great help to assess recovery in these settings. Currently, assessment of recovery from GA after laparoscopic surgeries, in our hospital, is by modified Aldrete score at all phases of recovery i.e. in the immediate postoperative period, PACU & also in the ward. The current study used definite recovery assessment scores and a comparative evaluation between both the scores. Documentation of the entire recovery process and problems associated (pain & PONV) at all the phases of recovery using this scoring system will help to get clearer and objective assessment of the same, promoting optimal utilization of the limited infrastructure and associated costs. With the use of FTC objective assessment of pain and PONV is possible which can filter out the patients in the early recovery phase itself. Ongoing monitoring and appropriate treatment in these

patients can help to bypass the PACU/HDU stay. This will help to reduce the cost of expensive monitoring equipments, nursing personnel, patient transfer costs, medication costs while improving the turnover rates in PACU/HDU. Adoption of the scoring systems in resource-limited settings can potentially help to use the resources judiciously and reduce the treatment costs, while maintaining the quality of care. However, future research on cost-benefit analysis regarding use of such recovery scores will be useful.

This study had several strengths. Firstly, this study informs us that the average time to recovery from GA in Indian adults undergoing laparoscopic surgeries are at an average of 18.6 minutes with a standard deviation of 6.45 minutes. Secondly, this study is a novel effort to compare these two scoring systems in Indian hospital settings. Though modified Aldrete score and fast- track criteria are the two commonly used scoring systems to assess recovery from general anaesthesia, there are no published reports that have compared these two scores, particularly in LMIC settings like India. The study findings will help the anesthesiologists to better understand the utility of the two scoring systems to shift patients undergoing laparoscopic surgeries from the operating room at the earliest for those who achieve recovery. This knowledge is critical in LMIC settings like India where the burden of surgeries is high, and space is limited. Additionally, the study was carefully designed to minimize inter-observer variations; one trained clinical anesthesiologist performed all the recordings in these 80 participants under observation of a senior faculty of the department of Anaesthesia. Nonetheless, the study had some limitations. This study was limited to the specific age group of 18-65 years, and ASA grade I & II. We therefore could not comment on the co-morbidities that can potentially influence the time to recovery after GA in subjects undergoing laparoscopic surgeries. Most (43.7%) of the laparoscopic surgeries in this population

were laparoscopic cholecystectomy, which may not correctly represent the entire spectrum of laparoscopic surgeries which is a limitation. Ideal would be to have equal proportion of all three types of laparoscopic surgeries to have greater generalizability. Further research to evaluate the usefulness of these recovery scores for efficient utilization of OT time, rapid turnover, nursing and overall cost would be beneficial.

CONCLUSION

Adequate recovery from general anaesthesia must be achieved and documented prior to shifting the patient from operation theatre to PACU / HDU immediately after surgery and again before transfer from PACU / HDU to the general ward. A discharge scoring system is effective to determine the optimal length of stay in the ambulatory surgery unit and to achieve the prompt and safe discharge of patients. Fasttrack criteria and modified Aldrete score seem to be equally good in assessing immediate recovery from general anaesthesia after laparoscopic surgery, prior to shifting patient from operation theatre to PACU / HDU.

However, the FTC is better for documenting adequate recovery for transfer of patient from PACU / HDU to the general ward as it provides assessment of PONV and pain. Discharge of Laparoscopic patients from PACU significantly reduces bed utilization, decreases in-hospital transfers, and allows congested hospitals to better accommodate patient care needs, reduce burden on nursing staff and generate additional revenue. Ambulatory surgery is continuing to grow and expand, advances in surgical techniques (e.g.,minimally invasive surgery), anesthetic pharmacology, regional anesthesia, and postoperative analgesia, will allow even more complex procedures to be conducted on an ambulatory basis. Discharge scoring systems will help to facilitate discharge of the patient with improved understanding of potential complications and will help to ensure the safe recovery and discharge of patients following their outpatient procedures.

SUMMARY

A total of 80 patients of ASA grade 1 and 2, undergoing laparoscopic surgery were observed for post operative recovery according to either MAS or the FTC criteria.

The Mean Age in Group FTC was 40.43 ± 13.08 and in Group MAS was 40.55 ± 12. There was no significant difference in mean Age comparison between two groups.

Sex distribution was also comparable in both groups, with 26 females and 14 males in MAS group, whereas it was 21 females and 19 males in FTC group.

Majority of the patients, both groups included had no co-morbidities, who accounted to 28/40(75%) in MAS group and 30/40 in FTC group (75%).. There was no statistically significant difference with respect to co-morbidities in MAS and FTC criteria.

The ASA grade of subjects in my study is 1 and 2. Majority were Grade 1 in MAS and FTC group, 28 and 31 respectively. Rest of the subjects had ASA Grade 2, 12 in MAS and (in FTC group.

Mean Weight in Group FTC was 63.28 ± 13.19 and in Group MAS was 61.58 ± 9.76. There was no significant difference in mean Weight comparison between two groups showed no statistical significance (P-value: 0.514)

Mean HR in Group FTC was 79.8 ± 8.02 and in Group MAS was 79.95 ± 6.22. There was no significant difference in mean HR comparison between two groups. (P-value:0.926)

Mean SBP in Group FTC was 120.75 ± 10.71 and in Group MAS was 119.75 ± 14.05. There was no significant difference in mean SBP comparison between two groups. (P-value:0.72).

Mean DBP in Group FTC was 77.75 ± 7.68 and in Group MAS was 75.75 ± 8.74. There was no significant difference in mean DBP comparison between two groups. (P-value:0.28).

Mean SpO2 in Group FTC was 98.8 ± 0.97 and in Group MAS was 98.98 ± 1.14. There was no significant difference in mean SpO2 comparison between two groups. (P-value:0.462).

Mean Duration of Surgery in Group FTC was 128 ± 31.94 and in Group MAS was 133.63 ± 29.91. There was no significant difference in mean duration of surgery comparison between two groups.

Mean Recovery Time in Group FTC was 18.25 ± 6.94 and in Group MAS was 20.5 ± 5.41. There was significant difference in mean Recovery Time comparison between two groups (P-value:0.011*). Hence, patients can be moved to recovery area by 18.25 ± 6.94 according to FTC criteria and 20.5 ± 5.41 according to MAS criteria .There is a delay of 2.25 to move the patient to recovery according to MAS.

Tracheal extubation times for each patient belonging to both the groups (MAS and FTC) were noted down and recovery scores were calculated every 5 mins until 30 mis post extubation and at 2,4,6,12 and 24 hrs post extubation.

The requirement of rescue analgesia and antiemetics were observed post operatively in patients assessed with FTC criteria.It is observed that almost all patients were pain free during first 30 mins post surgery.5% of the patients in the FTC group required rescue analgesic 1.5 hrs post surgery,17.5% patients required 2.5 hrs after surgery,30 % of the patients in the FTC group required rescue analgesia in 4 hr-6 hr time interval post extubation.

10% of the patients in the FTC group complained of PONV and required Antiemetic in 2hr-4 hr time interval post extubation and 12.5% required antiemetic 6 hrs post extubation.These post

operative symptoms caused a dip in the FTC scores in 12.5% of the patients around 4hr-6 hr time interval post extubation in the patients of FTC group

From our study, both modified Aldrete score and fast-track criteria seem good for assessing recovery in immediate post-op period in this setting. However, given that FTC additionally documents the PONV and post-operative pain, it should be given a higher preference to MAS as a tool, to be used to document adequate recovery and transfer of patient from PACU /high dependency unit (HDU) to the general ward. Discharge of laparoscopic patients from PACU significantly reduces bed utilization, decreases in-hospital transfers, and allows congested hospitals to better accommodate patient care needs, reduce burden on nursing staff and generate additional revenue.

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ANNEXURE I

ETHICAL COMITTEE CLEARANCE CERTIFICATE

IEC/NO-131/2019
22-11-2019

B.L.D.E. (DEEMED TO BE UNIVERSITY)

(Declared vide notification No. F.9-37/2007-U.3 (A) Dated. 29-2-2008 of the MHRD, Government of India under Section 3 of the UGC Act, 1956)

The Constituent College

SHRI. B. M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE

INSTITUTIONAL ETHICAL CLEARANCE CERTIFICATE

The ethical committee of this college met on 13-11-2019 at 3-15 pm to scrutinize the synopsis of Postgraduate students of this college from Ethical Clearance point of view. After scrutiny the following original/corrected and revised version synopsis of the Thesis has been accorded Ethical Clearance

Title: Comparision of modified aldrete score versus fast track criteria for evaluating post operative recovery in patients undergoing laparoscopic surgery

Name of PG student: Dr. Shravya Emmanni, Department of Anaesthesiology

Name of Guide/Co-investigator:, Dr. Vidya Patil, Prof & HOD
Department of Anaesthesiology

DR RAGHVENDRA KULKARNI
CHAIRMAN
Institutional Ethical Committee
BLDEU's Shri B.M. Patil
Medical College,BIJAPUR-586103

Following documents were placed before Ethical Committee for Scrutinization:

1. Copy of Synopsis / Research project
2. Copy of informed consent form
3. Any other relevant documents.

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B.L.D.E.(Deemed to be University)
SHRI B.M.PATIL MEDICAL COLLEGE,VIJAYAPUR-586103
INSTITUTIONAL ETHICAL COMMITTEE

Date : 13-11-2019

1. Name of UG/PG Students/Researcher: Dr. Shravya Emmanni
2. Department : Anaesthesiology
3. Title : Comparision Of Modified Aldrete Score Versus Fast Track Criteria For Evaluating Post Operative Recovery In Patients Undergoing Laproscopic Surgery
4. Guide/Co-Guide/Principle Researcher: Dr. Vidya Patil, Prof & HOD
5. Date of Admission (PG Only) :

Observation :

- No ethical issues observed

I.E.C. Remarks : Ethical Clearance accorded/be Chairman after corrected revised version is submitted by stipulated time.
1. Any alternation in Synopsis protocol should be intimated to E.C. in writing for review & approval.
2. Any adverse effects to subject of the study should be intimated in writing to E.C.
3. If study is stopped or an included patient is out of study inform E.C. the same with reason.

Signature of the Committee Members :

1. Dr Raghavendra Kulkarni, Chairman
2. Dr Tejaswini Vallabha
3. Dr Akram Naikawadi
4. Dr P.B.Jaju
5. Dr Chandrashekhar Bhuyyar
6. Dr Pranesh Jahagirdar
7. Dr Manjunatha Aithala
8. Dr Satish Patil
9. Dr Mohammed Shannawaz

ANNEXURE II

INFORMED CONSENT FORM

B.L.D.E.U.'s SHRI B.M. PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTRE, VIJAYPURA – 586103, KARNATAKA

TITLE OF THE PROJECT : COMPARISION BETWEEN MODIFIED ALDRETE SCORE AND FAST TRACK CRITERIA FOR EVALUATING POST OP RECOVERY IN PATIENTS UNDERGOING LAPAROSCOPIC SURGERY

PRINCIPAL INVESTIGATOR: Dr. SHRAVYA EMMANNI
Department of Anaesthesiology
B.L.D.E(DEEMED TO BE UNIVERSITY)
Shri B.M. Patil Medical College and Research
Centre, Sholapur Road VIJAYAPURA-03

PG GUIDE : Dr. VIDYA PATIL
Professor And HOD
Department of Anaesthesiology
B.L.D.E(DEEMED TO BE UNIVERSITY)
Shri B.M. Patil Medical College and Research
Centre, Sholapur Road VIJAYAPURA-03

PURPOSE OF RESEARCH:

I have been informed that this, study is **:"**COMPARISION BETWEEN MODIFIED

ALDRETE SCORE AND FAST TACK CRITERIA FOR EVALUATING POST OP

RECOVERY IN PATIENTS UNDERGOING LAPAROSCOPIC SURGERY" I have been

explained about the reason for conducting this study and selecting me/my ward as a subject for this study. I have also been given free choice for either being included or not in the study.

PROCEDURE:

I understand that I will be participating in the study **"**COMPARISION BETWEEN MODIFIED ALDRETE SCORE AND FAST TACK CRITERIA FOR EVALUATING POST OP RECOVERY IN PATIENTS UNDERGOING LAPAROSCOPIC SURGERY''

RISKS AND DISCOMFORTS:

I understand that I/my ward may experience complications during the study and I understand that necessary measures will be taken to reduce complications as and when they arise.

BENEFITS:

I understand that I/my wards participation in this study will help in finding out**.** **"**COMPARISION BETWEEN MODIFIED ALDRET SCORE AND FAST TACK CRITERIA FOR EVALUATING POST OP RECOVERY IN PATIENTS UNDERGOING LAPAROSCOPIC SURGERY"

CONFIDENTIALITY:

I understand that medical information produced by this study will become a part of this Hospital records and will be subjected to the confidentiality and privacy regulation of this hospital. Information of a sensitive, personal nature will not be a part of the medical records, but will be stored in the investigator's research file and identified only by a code number. The code key connecting name to numbers will be kept in a separate secure location.

If the data are used for publication in the medical literature or for teaching purpose, no names will be used and other identifiers such as photographs and audio or video tapes will be used only with my special written permission. I understand that I may see the photograph and videotapes and hear audiotapes before giving this permission.

REQUEST FOR MORE INFORMATION:

I understand that I may ask more questions about the study at any time.

Dr SHRAVYA EMMANNI is available to answer my questions or concerns. I understand that I will be informed of any significant new findings discovered during the course of this study, which might influence my continued participation.

If during this study, or later, I wish to discuss my participation in or concerns regarding this study with a person not directly involved, I am aware that the social worker of the hospital is available to talk with me.

And that a copy of this consent form will be given to me for keep for careful reading.

REFUSAL OR WITHDRAWAL OF PARTICIPATION:

I understand that my participation is voluntary and I may refuse to participate or may withdraw consent and discontinue participation in the study at any time without prejudice to my present or future care at this hospital.

I also understand that **Dr.SHRAVYA EMMANNI** will terminate my participation in this study at any time after he has explained the reasons for doing so and has helped arrange for my continued care by my own physician or therapist, if this is appropriate

INJURY STATEMENT:

I understand that in the unlikely event of injury to me/my ward, resulting directly to my participation in this study, if such injury were reported promptly, then medical treatment would be available to me, but no further compensation will be provided.

I understand that by my agreement to participate in this study, I am not waiving any of my legal rights.

I have explained to _____, the purpose of this research, the procedures required and the possible risks and benefits, to the best of my ability in patient's own language.

Date: Dr.VIDYA PATIL (Guide) Dr. SHRAVYA EMMANNI (Investigator)

STUDY SUBJECT CONSENT STATEMENT:

I confirm that **Dr SHRAVYA EMMANNI** has explained to me the purpose of this research, the study procedure that I will undergo and the possible discomforts and benefits that I may experience, in my own language.

I have been explained all the above in detail in my own language and I understand the same. Therefore I agree to give my consent to participate as a subject in this research project.

_____ _____

(Participant) Date

_____ _____

(Witness to above signature) Date

ANNEXURE – III

PROFORMA

Patient name - Date -

Address-

I.P. number -

Age - Sex - Male/Female Weight –

Height –

Diagnosis -

Proposed Surgery -

ASA - Consent-

Medical and surgical history -

Examination in brief -:

GeneralPhysical

Examination

Vitals -: Pulse-

Respiratory rate: B.P. - Airway assessment -

Systemic examination -:

R.S. - C.V.S. -

C.N.S. - P/A -

PREOPERATIVE INVESTIGATIONS -:

Hb% -

TLC/DLC -

Platelet count - BT/CT -

RBS - mg/dl

Blood Urea: Serum Creatinine:

Chest X ray if required: ECG:

Other Investigations:

Monitors Attached-

Pulse Rate:

B.P.:

SpO2:

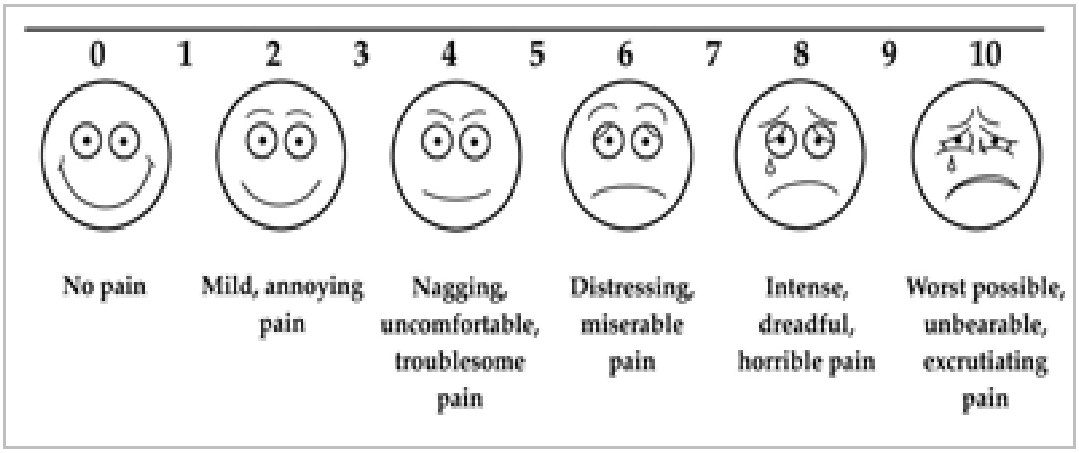
ECG:

Anaesthesia Start time:

Surgery Start Time: Surgery End Time:

PARAMETERS OBSERVED POST EXTUBATION

TIME► PARAMETER ▼	**5 mins**	**10 mins**	**15 mins**	**20 mins**	**25 mins**	**30 mins**	**2 hrs**	**6 hrs**	**12 hrs**	**24 hrs**
SpO2										
MAP										
Consciousness										
Respiration										
Activity										
Post op pain VAS score										
Post op nausea and vomiting										



VAS PAIN SCALE : 0-NO PAIN 10-WORST PAIN.

Time after surgery	Modified Aldret score	Fast track criteria score
5 minutes		
10 minutes		
15 minutes		
20 minutes		
25 minutes		
30 minutes		
2 hours		
6 hours		
12 hours		
24 hours		

Use of Analgesics post operatively :

Time of the drug given-

Dose of the drug given-

Use of Anti Emetics post operatively:

Time of the drug given

-Dose of the drug given-

BIODATA OF GUIDE

GUIDE NAME	:	**DR.VIDYA PATIL M.D**.
DATE OF BIRTH	:	23/09/1965
EDUCATION	:	M.B.B.S.- 1991 J.N.MC,BELGAUM KARNATAKA UNIVERSITRY DHARWAD
		M.D ANAESTHESIOLOGY- 1997 J.N.M.C. BELGAUM, KARNATAKA UNIVERSITRY DHARWAD
DESIGNATION	:	PROFESSOR AND HEAD OF THE DEPARMENT DEPARTMENT OF ANAESTHESIOLOGY
TEACHING	:	UG TEACHER-20 YEARS PG TEACHER-20 YEARS
ADDRERSS	:	PROFESSOR AND HEAD OF THE DEPARTMENT DEPARTMENT OF ANAESTHESIOLOGY B.L.D.E(DEEMED TO BE UNIVERSITY) SHRI B.M.PATIL MEDICAL COLLEGE AND RESEARCH CENTRE, VIJAYAPURA – 586103
PHONE	:	(08352)261260
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BIO DATA OF INVESTIGATOR

NAME	:	DR. SHRAVYA EMMANNI
QUALIFICATION	:	M.B.B.S.
K.M.C. REG. NO.	:	ANP 2011 0001637 KTK
ADDRESS	:	DEPARTMENT OF ANAESTHESIOLOGY B.L.D.E(DEEMED TO BE UNIVERSITY) SHRI B.M.PATIL MEDICAL COLLEGE AND RESEARCH CENTRE, VIJAYAPURA – 586103
Contact Number	:	6366067240
E mail	:	shravya.emmanni@gmail.com

KEY TO MASTER CHART

FTC – Fast track criteria

MAS – Modified Akdrete Score

HTN- Hypertension

DM- Diabetes Mellitus

HR- Heart Rate

SBP- Systolic blood pressure

DBP- Diastolic blood pressure

Min- Minutes

Hr- Hours

L.CHOLE- Laparoscopic Cholecystectomy

MASTER CHART

S.NO	IPNo	GRP	Group	AGE	SEX	WEIGHT	Comorbidities	ASAGRADE	SURGERY	HR	SBP	DBP	SpO2	DURATIONOFSURGERY	@5MINS	@10MINS	@15MINS	@20MINS	@25MINS	@30MINS	@2HRS	@6HRS	@12HRS	@24HRS	RECOVERYTIME	RESCUEANALGESIA	ANTIEMETIC	
1	1629	FTC	1	45	Female	72	Anaemia	2	LCHOLE	84	130	80	98	100	8	9	9	10	11	12	12	13	14	14	10	90 mins	120	
2	3153	FTC	1	37	Male	83		1	L.HERNIOPLSTY	80	110	80	98	150	6	6	7	8	10	12	13	12	12	14	30	70 mins		
3	2572	FTC	1	60	Male	75	HTN	2	L.FUNDOPLICATION	82	110	70	97	90	8	9	10	11	12	11	12	13	14	14	10	120 mins		
4	3757	FTC	1	51	Male	86		1	LCHOLE	90	130	90	99	110	6	8	10	12	12	13	12	13	14	14	10	110 mins	4 hrs	
5	431135	FTC	1	50	Male	55		1	LAPPENDICECTOMY	86	120	80	99	90	10	11	12	12	13	13	13	14	14	14	15	180 mins	4 hrs	
6	3974	FTC	1	20	Female	54		1	LAPPENDICECTOMY	78	110	70	100	85	10	12	12	13	13	12	12	14	14	14	10			
7	14263	FTC	1	50	Male	70	DM	2	LCHOLE	76	130	80	99	140	9	10	11	12	12	12	13	12	12	13	20	5.30 HRS	4 hrs	
8	8424	FTC	1	29	Male	60	HTN	1	LCHOLE	72	120	80	100	170	8	9	9	12	14	14	13	13	14	14	20	4 HRS		
9	15838	FTC	1	40	Male	45		1	LCHOLE	82	110	80	98	145	6	8	8	10	12	12	13	13	14	14	25	150 mins	180 mins	
10	15747	FTC	1	25	Male	55		1	LCHOLE	76	110	80	99	90	10	12	12	12	12	14	14	14	14	14	10	6 hrs		
11	6769	FTC	1	56	Male	65	DM	2	LCHOLE	82	110	70	99	100	10	10	12	13	13	14	13	13	14	14	15	4 hrs		
12	17692	FTC	1	58	Male	68		1	L.VAGINAL HYSTCTY	98	130	80	97	95	10	11	12	12	13	13	13	14	14	14	15	180mmins		
13	9592	FTC	1	55	Female	72	HTN	2	LCHOLE	104	140	100	98	185	6	6	8	10	11	12	12	13	14	14	30	100 mins	2 hrs	
14	8876	FTC	1	42	Female	54		1	LHYSTERECTOMY	82	120	70	99	135	8	8	10	12	12	13	13	14	14	14	10	90 mins		
15	8424	FTC	1	29	Male	73		1	LCHOLE	74	130	80	100	180	10	10	12	12	12	13	13	14	14	14	15	6 hrs	6 hrs	
16	6769	FTC	1	56	Male	80		1	LCHOLE	86	120	70	99	160	9	9	10	12	12	12	13	13	14	14	20	6 hrs	5 hrs	
17	9261	FTC	1	43	Female	66	Anaemia	2	L.V.HYSTERECTOMY	76	110	70	99	180	6	7	8	10	12	13	13	14	14	14	25	120 mins		
18	9153	FTC	1	59	Male	83		1	LAPPENDICECTOMY	88	130	80	98	90	10	12	12	13	14	14	14	14	14	14	10	5 hrs		
19	8302	FTC	1	45	Female	48		1	LAPPENDICECTOMY	84	130	90	100	100	10	12	13	13	13	14	14	14	14	14	10	6 hrs		
20	2066	FTC	1	48	Male	78		1	L.HERNIOPLASTY	76	130	80	98	135	10	11	12	13	13	13	14	14	14	14	15	140 mins		
21	5044	FTC	1	38	Male	86		1	LCHOLE	74	120	70	99	155	9	10	12	12	13	14	14	14	14	14	15	4 hrs		
22	3153	FTC	1	37	Male	50		1	L.FUNDOPLICATION	80	110	80	99	160	7	7	8	10	12	12	13	13	14	14	25	160 mins	4 hrs	
23	3090	FTC	1	29	Female	56		1	LHYSTERECTOMY	82	110	70	97	160	6	8	10	10	12	12	13	14	14	14	25	160 mins		
24	6129	FTC	1	41	Female	70	HTN	2	LCHOLE	74	150	90	98	140	6	7	8	9	10	12	13	13	14	14	30	100 mins	2 hrs	
25	4311	FTC	1	35	Female	50		1	LAPPENDICECTOMY	80	110	70	99	110	8	9	10	12	13	13	14	14	14	14	20	120 mins		
26	820	FTC	1	24	Female	55		1	LCHOLE	70	110	80	100	130	10	10	12	13	13	13	13	14	14	14	15	170 mins		
27	2582	FTC	1	60	Male	78	HTN	2	L.FUNDOPLICATION	72	140	90	100	130	10	12	12	13	13	14	14	14	14	14	10	4 HRS	6 hrs	
28	3974	FTC	1	20	Female	60		1	LAPPENDICECTOMY	78	110	70	100	90	10	12	12	12	13	13	13	14	14	14	10	5 hrs		
29	8078	FTC	1	40	Female	52		1	LHYSTERECTOMY	76	130	80	99	140	8	10	12	12	12	13	13	14	14	14	15	200 mins		
30	8098	FTC	1	42	Female	35		1	LCHOLE	72	120	70	98	100	10	10	12	13	13	13	13	13	14	14	15	4 hrs	2 hrs	
31	9590	FTC	1	19	Male	65		1	LAPPENDICECTOMY	88	110	80	99	90	9	12	12	13	13	14	14	14	14	14	10	6 hrs		
32	8593	FTC	1	23	Male	56		1	LAPPENDICECTOMY	90	130	70	99	80	10	12	12	13	13	13	14	14	14	14	10	4 hrs		
33	8914	FTC	1	47	Female	74		1	LHYSTERECTOMY	82	110	70	98	150	8	9	10	10	12	13	13	13	14	14	25	200 mins		
34	9452	FTC	1	36	Female	48		1	L.FUNDOPLICATION	70	110	70	100	135	6	8	10	12	12	13	14	14	14	14	20	130 mins	5 hrs	
35	6521	FTC	1	21	Female	70		1	LAPPENDICECTOMY	82	120	80	100	115	10	12	12	13	13	14	14	14	14	14	10	160 mins		
36	6146	FTC	1	22	Female	50		1	L.TORSION REPAIR	78	120	80	100	150	8	12	12	12	13	14	14	14	14	14	10	150 mins		
37	5491	FTC	1	24	Female	74		1	L.TUBECTOMY	86	120	70	100	80	9	12	14	14	14	14	14	14	14	14	10	6 hrs		
38	5608	FTC	1	55	Female	45		1	LCHOLE	70	130	80	98	160	6	8	8	10	12	14	14	14	14	14	25	180 mins		
39	983	FTC	1	56	Female	45	DM	2	LCHOLE	70	110	70	97	170	8	8	10	12	13	14	14	14	14	14	20	4 hrs	5 hrs	
40	19133	FTC	1	50	Female	70		1	LCHOLE	62	130	90	98	145	6	7	7	8	10	12	13	13	14	14	30	150 mins		

41	14099	MAS	2	51	Male	75	DM	2	L.CHOLE	86	150	90	99	130	5	6	8	9	10	10	10	10	10	10	20	
42	15747	MAS	2	25	Male	70	HTN	1	L.CHOLE	78	110	60	100	120	7	8	8	9	9	10	10	10	10	10	20	
43	16037	MAS	2	29	Female	50		1	HYSTEROLAPROSCOPY	80	110	70	100	110	6	7	8	8	9	9	10	10	10	10	25	
44	15838	MAS	2	40	Female	45		1	L.CHOLE	82	110	80	99	130	6	7	7	8	9	9	10	10	10	10	25	
45	16200	MAS	2	37	Male	60		1	L.CHOLE	82	110	70	99	165	6	6	7	7	8	9	10	10	10	10	30	
46	18559	MAS	2	35	Male	62	DM	2	L.APPENDICECTOMY	88	130	80	99	100	8	8	8	9	9	10	10	10	10	10	20	
47	5061	MAS	2	60	Male	50		2	L.CYST EXCISION	80	150	80	97	160	7	8	8	9	9	9	10	10	10	10	20	
48	10274	MAS	2	43	Female	70		1	L.CHOLE	92	110	90	98	130	6	8	9	9	10	10	10	10	10	10	15	
49	10625	MAS	2	42	Female	65		1	L.CHOLE	68	100	70	98	180	5	6	7	8	8	9	10	10	10	10	30	
50	9871	MAS	2	60	Female	60	HTN	2	L.CHOLE	84	120	60	97	170	5	5	6	7	7	9	10	10	10	10	30	
51	9740	MAS	2	27	Male	70		1	L.HERNIOPLASTY	70	110	60	100	165	7	7	8	9	9	10	10	10	10	10	20	
52	12768	MAS	2	51	Male	77	HTN	2	L.HERNIOPLASTY	66	130	90	99	150	6	6	8	8	9	9	10	10	10	10	25	
53	13573	MAS	2	42	Female	50	HTN	2	L.CHOLE	74	140	90	99	160	5	7	8	9	9	9	10	10	10	10	20	
54	17482	MAS	2	60	Female	65	HTN	2	L.CHOLE	70	120	80	98	180	7	8	8	9	9	10	10	10	10	10	20	
55	21856	MAS	2	52	Male	60		1	L.HERNIOPLASTY	80	120	70	97	130	6	7	7	9	9	9	10	10	10	10	20	
56	20769	MAS	2	30	Female	60		1	L.HERNIOPLASTY	84	100	60	100	110	8	8	9	9	10	10	10	10	10	10	15	
57	25380	MAS	2	36	Female	58		1	L.APPENDICECTOMY	82	110	70	100	100	8	8	9	10	10	10	10	10	10	10	15	
58	20683	MAS	2	45	Male	49		1	L.RECTOPEXY	80	130	90	100	180	5	6	7	9	9	9	10	10	10	10	20	
59	32222	MAS	2	27	Female	55		1	L.APPENDICECTOMY	76	100	70	100	80	8	9	9	9	10	10	10	10	10	10	10	
60	28280	MAS	2	60	Male	60	HTN	2	L.CHOLE	84	150	80	98	170	7	8	9	9	10	10	10	10	10	10	15	
61	115159	MAS	2	19	Female	66		1	DIAGNOSTIC LAP	82	110	70	100	100	8	8	9	10	10	10	10	10	10	10	15	
62	131941	MAS	2	29	Male	85		1	L.HERNIOPLASTY	78	130	80	100	150	7	7	8	9	9	9	10	10	10	10	20	
63	122233	MAS	2	47	Female	55		1	L.VAGINAL HYSTCTY	82	120	80	97	140	5	7	7	8	9	9	10	10	10	10	25	
64	153739	MAS	2	27	Female	56		1	L.TUBECTOMY	82	120	70	100	80	6	8	9	9	10	10	10	10	10	10	15	
65	141592	MAS	2	32	Female	70		1	L.CHOLE	88	110	70	100	130	8	9	9	9	10	10	10	10	10	10	10	
66	166780	MAS	2	24	Female	55		1	L.SALPINGECTOMY	82	120	80	100	140	7	8	8	9	9	10	10	10	10	10	20	
67	159682	MAS	2	34	Female	50	Anaemia	2	DIAGNOSTIC LAP	80	110	70	100	110	7	7	8	8	9	9	10	10	10	10	25	
68	167747	MAS	2	27	Female	57		1	L.APPENDICECTOMY	68	130	80	100	100	7	7	8	9	9	10	10	10	10	10	20	
69	11629	MAS	2	45	Female	42	Anaemia	2	L.CHOLE	84	130	80	98	145	6	7	8	9	10	10	10	10	10	10	20	
70	16820	MAS	2	43	Female	66		1	L.VAGINAL HYSTCTY	76	110	70	98	175	5	6	6	8	9	10	10	10	10	10	25	
71	151333	MAS	2	24	Female	60		1	L.CHOLE	70	100	70	100	140	6	7	7	8	8	9	10	10	10	10	30	
72	14253	MAS	2	55	Female	65		1	L.CHOLE	80	110	80	97	135	5	5	7	8	10	10	10	10	10	10	25	
73	9592	MAS	2	50	Female	68	DM	2	L.CHOLE	94	140	80	98	90	6	6	9	9	9	10	10	10	10	10	15	
74	18424	MAS	2	38	Female	60		1	L.CHOLE	78	120	80	100	170	6	6	9	9	9	10	10	10	10	10	15	
75	116203	MAS	2	37	Male	70		1	L.CHOLE	82	110	70	99	100	8	8	9	9	10	10	10	10	10	10	15	
76	16037	MAS	2	29	Female	50		1	DIAGNOSTIC LAP	80	110	70	100	110	7	7	8	9	9	10	10	10	10	10	20	
77	14499	MAS	2	50	Male	75	DM	2	L.CHOLE	86	140	80	100	120	5	6	7	8	9	9	10	10	10	10	25	
78	17692	MAS	2	52	Female	54		1	L.HYSTERECTOMY	80	130	90	98	170	6	6	7	8	8	9	10	10	10	10	30	
79	9153	MAS	2	60	Male	78		1	L.APPENDICECTOMY	78	120	80	97	100	6	7	7	9	9	10	10	10	10	10	20	
80	8914	MAS	2	48	Female	70		1	L.HYSTERECTOMY	82	110	70	100	120	7	8	9	9	10	10	10	10	10	10	15	