

## Study of Total Intravenous Anaesthesia in Laparoscopic Surgery in Andhra Pradesh Population

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Conflict of interest: Nil

### Abstract:

**Background:** Total intravenous anesthesia in laparoscopic surgery is safer than laparotomy operation because propofol, a sedative hypnotic agent with excellent recovery drug and antiemetic properties with analgesic effects, has become more popular in laparoscopic surgery.

**Method:** 95 adult patients aged between 20 to 65 undergoing laparoscopic surgery were studied. A solution of propofol containing different concentrations of sufentanil (1 µgm per ml and 2 µgm/ml) was infused. The patient's HR, SBP, DBP, MAP, and peripheral O<sub>2</sub> saturation from the anesthesia monitor were taken as baseline measurements. All the hemodynamic parameters were recorded intraoperatively at different intervals of duration.

**Results:** The changes in mean values of hemodynamic values were insignificant, and only significant parameters were noted. 158.9 (± 76.9) mean value of time to rescue analgesia (in minutes) Post-surgical complications are 8 (8.4%) nausea and vomiting.

**Conclusion:** In the present pragmatic study, it is confirmed that the propofol and sufentanil combination is ideal for laparoscopic surgeries because of the lowest post-surgical complications and hemodynamic stability.

**Keywords:** anesthesia, hemodynamics, propofol, sufentanil, laparoscopy, TIVA.

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### Introduction

Total intravenous anesthesia (TIVA) is an evolved concept of general anesthesia that obviates the need for volatile anesthetics [1]. A minimally invasive technique called laparoscopic surgery because of less incision bleeding, less trauma, and quick post-operative recovery [2]. The imbalance of hemostasis does not stop with the end of operation, but excessive stress lasting for a certain period can change the challenge for an anestheologist. Anaesthesiologists need careful preoperative evaluation and correct intraoperative management to ensure that the side effects of anesthesia can be reduced and patients can recover quickly [3].

Propofol a sedative hypnotic agent with excellent recovery characteristics at the end of infusion and additional antiemetic properties, has become a drug of choice for TIVA.

Synthetic opioids (fentanyl congeners) provide excellent analgesia for various types of surgeries due to their advantages, like synergistic action with propofol rapid induction and less cardiovascular and respiratory depression with rapid recovery. Hence, an attempt is made to evaluate the efficacy of TIVA in different laparoscopic surgeries.

### Material and Method

95 (ninety-five) patients between 20 to 65 ages admitted to the GSL Medical College Hospital, Rajahmundry, Andhra Pradesh 533276 were studied.

**Inclusion Criteria:** patients in grades I and II who gave written consent and were ready to undergo laparotomies were selected for the study.

**Exclusion Criteria:** Patients with known drug allergies, type II diabetes, cardiovascular disease, and immune compromised patients were excluded from the study.

**Method:** A detailed history of occupation and social status was noted. Pre-anesthetic checkups were done, and solutions of propofol containing different concentrations of sufentanil were prepared as per the protocol: 1 µg/ml and 2 µg/ml. Preinduction measurements of heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP), and peripheral oxygen saturation from the anesthesia monitor were taken as the baseline measurements. All the hemodynamic parameters were recorded intraoperative-

ly; separate recording of the time duration required for rescue analgesia was done, as was the prevalence of postoperative complications.

Duration of study was from April 2022 to May 2023.

#### Statistical Analysis:

The hemodynamic parameters indicating the prevalence of complications were also noted. The mean values of hemodynamic variables were statistically insignificant, and only significant parameters were

noted. This was done in SPSS software. The ratio between males and females was 1:2.

#### Observation and Results

##### Table 1:

The mean time for rescue analgesia in 95 (ninety five) patients was 158.9 ( $\pm$  76.90).

##### Table 2:

Post-surgical complications were Nausea and vomiting in 8 (8.4%) of the patients

**Table 1: Study of mean time to rescue analgesia**

Parameter time to rescue	Total No. of Patients	Mean value
Analgesia (minutes)	95	158.9 (+76.9)

**Table 2: Study post-surgical complication**

Parameter time to rescue	Total No. of Patients	Percentage (%)
Nausea and vomiting	8	8.4%

#### Discussion

Present study of TIVA in laparoscopic surgery in the Andhra Pradesh population. The mean time to rescue analgesia (in minutes) was 158.9 ( $\pm$  76.9) minutes (Table 1), and post-surgical complications were nausea and vomiting in 8 (8.4%) patients (Table 2). These findings are in more or less agreement with previous studies [5,6,7].

Daycare surgery is a planned surgery where patients requiring early recovery and discharge are admitted for a short stay for surgery on a non-resident basis [8]. Laparoscopic surgery is the most common surgical procedure performed worldwide and is widely used today for laparoscopic appendectomy, lap cholecystomy, laphernioplasty, other urology surgeries, and gynecological surgeries like diagnostic laparoscopy for infertility, hysteroscopy for embryo transfer, etc.

TIVA is an evolved concept of general anesthesia that obviates the need for volatile anesthetics. Though laparoscopic surgical technique has a minimally invasive method, a stress response exists and runs throughout the peri-operative period of laparoscopic surgery, which alters hemodynamic parameters and may cause morbidity and mortality.

Hence, appropriate aesthetic drugs like propofol in Combination with sufentanil in different concentrations is needed to reduce stress during the perioperative period. Sufentanil is an analogue of fentanyl suitable for postoperative pain control because it has no active metabolites, shows a higher therapeutic index, and has a lower frequency of respiratory suppression [9].

For outpatient surgeries, intravenous sufentanil produces equivalent anesthesia to isoflurane or fentanyl. Recovery tends to be more rapid after sufentanil, and the requirement for postoperative

analgesia is lower [10]. Propofol is the preferred intravenous agent in daycare surgeries as it has smooth induction, rapid recovery, and some antiemetic properties [11].

In the present study, only a few patients required additional sufentanil boluses to maintain an adequate depth of anesthesia. Surfentanil mixed with propofol provides better hemodynamic stability in laparoscopic cholecystectomies with good postoperative analgesics.

#### Summary and Conclusion

Present TIVA in laparoscopic surgeries. Propofol is a sedative and hypnotic agent with excellent recovery properties, and sulfentanil, an opioid analgesic, enhances its properties. It is an ideal combination for laparoscopic surgery, but this study demands that such clinical trials of TIVA be conducted where larger numbers of patients and the latest technologies are available to confirm the significance of the results of the present TIVA study.

**Limitation of study:** Owing to tertiary location of research study institution, small number of patients lack of latest techniques we have limited finding and results.

This research work was approved by the ethical committee of GSL Medical College Hospital Rajahmundry Andhra Pradesh 533276

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