

ORIGINAL ARTICLE

PROPOFOL OR SEVOFLURANE – WHICH IS BETTER WITH RESPECT TO PREVENTING NAUSEA, VOMITING AND PAIN POSTOPERATIVELY?Purvi Mehta¹, Shishir Mehta², Deepak Mistry³**Author's Affiliations:** ¹Assistant Professor; ²Senior Resident; ³Professor, Dept. of Anesthesia, Muljibhai Patel Urological Hospital, Nadiad, Gujarat**Correspondence:** Dr Purvi Mehta Email: shishir.mht@gmail.com**ABSTRACT**

Introduction: Anesthetic agents today have been designed and marketed to meet specific niche criteria for ambulatory anesthesia. Propofol, Sevoflurane, etc. have significantly increased the ability of the anesthesiologist to provide a successful ambulatory surgical experience for the patient. This study was aimed at assessing the effect of Propofol and Sevoflurane in preventing postoperative nausea, vomiting and pain after laproscopic surgery among the patients of ASA 1 and 2.

Methodology: All patients having ASA 1 and ASA 2 physical status scheduled for laparoscopic surgery in the age group 20 to 70 years not having clinically significant cardiovascular, respiratory, hepatic, renal, neurologic, psychiatric or metabolic disease; non-pregnant; not having morbid obesity; not having history of alcohol and drug abuse and willing to give informed consent were included in the study. Patients were randomly divided into two groups, of which one were administered Propofol and two were administered Sevoflurane to maintain anesthesia.

Results: There were total 60 patients scheduled for laparoscopic surgery. Out of these 60 patients, 30 were administered Propofol and 30 were administered Sevoflurane as maintenance drug. Maximum number of nausea and vomiting were with Sevoflurane. Total 13 (43.3%) patients were having 4 times Nausea/Vomiting in first four hours postoperatively. Among patients to whom Propofol was administered, 17 (56.7%) not experienced any spell of nausea/vomiting in first 4 hours. Remaining patients also experienced only one spell of nausea/vomiting. post operative mild pain is seen in both group of patient. But moderate to severe pain is seen in Sevoflurane group. Least pain is seen in Propofol group. This suggestive that analgesic property of Propofol is greater than Sevoflurane.

Keywords: Post operative Nausea & Vomiting, Post operative pain, Laparoscopic surgery

INTRODUCTION

The history of ambulatory anesthesia is as old as the history of anesthesia itself. At its very inception anesthesia was provided for ambulatory surgery. in the 1840s the first uses of anesthesia by Crawford Long, Horace Wells, and William Morton occurred in office settings. By the turn of the last century, ambulatory anesthesia had been documented in the literature. James Nicoll documented the successful administration of 8988 ambulatory anesthetics in England in a 10-year period from 1899 to 1908.¹ Ralph Waters opened an outpatient facility in 1918 in Sioux City, Iowa, and described it in his seminal article.²

Anesthetic agents today have been designed and marketed to meet specific niche criteria for ambulatory anesthesia. Propofol, Sevoflurane, etc. have significantly increased the ability of the anesthesiologist to provide a successful ambulatory surgical experi-

ence for the patient.³ Because of the rapid onset and termination of effect of these agents, longer cases can be performed on an ambulatory basis. Patients recover much more quickly and can be discharged home more safely. Side effects such as the “hangover” effect have also been minimized.

Hemodynamic monitoring should be continued in the PACU. Hemodynamic changes induced by the pneumoperitoneum, and more particularly the increased systemic vascular resistance, outlast the release of the pneumoperitoneum. The hyperdynamic state developing after laparoscopy could conceivably lead to a precarious hemodynamic situation in patients with cardiac disease. Despite the reduction in postoperative pulmonary dysfunction, PaO₂ still decreases after laparoscopic surgeries.⁴

Increased oxygen demand is observed after laparoscopy. Although laparoscopy tends to be considered a

minor surgical procedure, oxygen should be administered postoperatively, even to healthy patients. Finally, prevention and treatment of nausea, vomiting, and pain are important, particularly after outpatient laparoscopic procedures.

This study was aimed to assess the effect of Propofol and Sevoflurane in preventing postoperative nausea, vomiting and pain after laparoscopic surgery among the patients of ASA 1 and 2.

METHODOLOGY

This study was done among the patients of ASA 1 and 2 physical status scheduled for laparoscopic surgery in Sterling Hospital, Ahmedabad.

All patients having ASA 1 and ASA 2 physical status scheduled for laparoscopic surgery in the age group 20 to 70 years not having clinically significant cardiovascular, respiratory, hepatic, renal, neurologic, psychiatric or metabolic disease; non-pregnant; not having morbid obesity; not having history of alcohol and drug abuse and willing to give informed consent were included in the study.

There were total 60 patients eligible for the study during the study period. All patients were randomly divided in two groups by chit method. Patients were asked to draw any one chit from total 60 chits which includes 30 chits written group 1 and 30 chits written group 2. This result was not revealed to study participants and observer. Patients having group 1 chit were administered Propofol and Patients having group 2 chit were administered Sevoflurane to maintain anesthesia. These drugs were given to drug administrator in closed envelope after confirming drug and removing labels.

General anesthesia was induced with IV Midazolam 0.03mg/kg, Propofol 1.5-2.5mg/kg, Fentanyl 2µg/kg and Ondansetron 4mg. Laryngoscopy and tracheal intubation was facilitated with Rocuronium 0.09mg/kg. Anesthesia was maintained initially with either Propofol 100 µg/kg/min (group 1) or Sevoflurane 1- 2%(group 2) in combination with N₂O 60% in O₂. Concentration of maintenance anesthetic varied to maintain hemodynamic variables within 15% of pre induction values i.e., Sevoflurane 0.6-1.75% and Propofol 50-150 µg/kg/min. All patients were mechanically ventilated to maintain end tidal CO₂ within 27-32 mm of mercury. In all cases, Propofol and Sevoflurane was discontinued when the laparoscope was removed. The N₂O was continued till the last suture. To minimize the risk of residual neuromuscular blockade after surgery, reversal of neuromuscular blockade was provided by neostigmine 50µg/kg and glycopyrrolate 8µg/kg.

Permission was obtained from the ethical committee of the institute to conduct the study. Informed writ-

ten consent of all patients were taken after explaining nature of the study. Patients not willing to take part in the study were given anesthesia as per standard protocol of the hospital without affecting course of treatment. Strict confidentiality was maintained during all parts of study.

In all patients spells of Nausea and Vomiting were recorded for 24 hrs postoperatively in separate data recording sheet. Data was entered and analysed using Microsoft excel.

RESULTS

There were total 60 patients scheduled for laparoscopic surgery. Out of these 60 patients, 30 were administered Propofol and 30 were administered Sevoflurane as maintenance drug.

Table 1 shows number of events of Nausea/ vomiting during first 4 hour postoperatively. Maximum numbers of events were with Sevoflurane. Total 13 (43.3%) patients were having 4 times Nausea/Vomiting in first four hours postoperatively.

Table 1: Comparison of postoperative events of nausea/vomiting (0-4hours)

No. of events of Nausea/ vomiting during 0-4hr	Propofol (%)	Sevoflurane (%)
0	17 (56.7)	0
1	12 (40.0)	0
2	1 (3.3)	2 (6.7)
3	0	5 (16.7)
4	0	13 (43.3)
5	0	8 (26.7)
6	0	2 (6.7)
Total	30 (100)	30 (100)

Table 2: Comparison of postoperative events of nausea/vomiting (4-24hours)

No. of events of Nausea/ vomiting during 4-24hr	Propofol (%)	Sevoflurane (%)
0	30 (100)	6 (20.0)
1	0	9 (30.0)
2	0	12 (40.0)
3	0	3 (10.0)
Total	30 (100)	30 (100)

Table 3: Post operative pain assessment by VAS

Pain VAS	Propofol (%)	Sevoflurane (%)
Mild pain	18 (60.0)	19 (63.3)
Moderate pain	1 (3.3)	7 (23.3)
No pain	11 (36.7)	4 (13.3)
Total	30 (100)	30 (100)

Among patients to whom Propofol was administered, 17 (56.7%) not experienced any spell of nau-

sea/vomiting in first 4 hours. Remaining patients also experienced only one spell of nausea/vomiting.

Both groups were compared for post operative nausea /vomiting. The incidences of nausea/vomiting were least seen with Propofol group as compare to Sevoflurane group of patient.

Table 3 suggests that post operative mild pain is seen in both group of patient. But moderate to severe pain is seen in Sevoflurane group. Least pain is seen in Propofol group. This suggests that analgesic property of Propofol is greater than Sevoflurane.

DISCUSSION

Laparoscopy is frequently associated with minor postoperative sequelae that can persist more than 48 hours and that can significantly delay discharge of outpatients. Postoperative pain of various types, one of the main complaints is postoperative nausea and vomiting (PONV) (40% to 75% of patients). Whereas perioperative opioids increase the incidence of PONV, Propofol anesthesia can markedly reduce the high incidence of these side effects. The effect of N₂O on the incidence of nausea is still controversial. Intraoperative drainage of gastric contents also reduces PONV. Intraoperative administration of droperidol and 5-hydroxytryptamine type 3 antagonists appears to be helpful in the prevention and treatment of these side effects. Transdermal scopolamine reduces nausea and vomiting after outpatient laparoscopy. Perioperative liberal intravenous fluid therapy can contribute to decreasing these symptoms and to improve postoperative recovery.

Because of antiemetic property of Propofol incidence of post operative nausea/vomiting are seen less with Propofol as compared to Sevoflurane. Propofol inhibits serotonin in the area postrema of brain. Incidence of post operative nausea vomiting for Sevoflurane and Propofol were 4.1+/-0.9 and 0.5+/-0.4 respectively (p=0.001).

Thus, Propofol has provided the added benefit of reducing PONV and pain relief, the biggest advantage in outpatient practice, the biggest side effect is delayed recovery. Muscle relaxant development has also benefited ambulatory surgery. There are several intermediate nondepolarizing neuromuscular blockers that are perfectly suited for the majority of ambulatory surgical procedures that require relaxation.

Gulcan Erk, Gulay Erdogan, Fazilet Sahin, Vildan Taspinar, Bayazit Dikmen compared the effects of Desflurane, Sevoflurane and Propofol on recovery characteristics and PONV in laparoscopic surgeries. They found that extubation and eye opening times (early recovery) were meaningfully lower in Desflu-

rane group. There were no significant differences observed in orientation, sitting and walking times (delayed recovery) and PONV amongst the groups. They concluded early recovery time was shortest in Desflurane group while delayed recovery time and PONV had no differences.⁵

Anil Gupta, MD⁶ et al in a systematic review compared on postoperative recovery and complications using four different anesthetic techniques with Propofol, Isoflurane, Sevoflurane, and Desflurane. The database MEDLINE was searched via PubMed (1966 to June 2002) using the search words "anesthesia" and with ambulatory surgical procedures limited to randomized controlled trials in adults (19 yr), in the English language, and in humans. A second search strategy was used combining two of the words Propofol, Sevoflurane, or Desflurane. They found that early recovery was faster with Desflurane when compared with Propofol-Isoflurane and with Sevoflurane when compared with Isoflurane. They concluded that the differences in early recovery times among the different anesthetics were small and in favor of the inhaled anesthetics. The incidence of side effects, specifically postoperative nausea and vomiting, was less frequent with Propofol.

Post operative pain assessed by visual analogue scale (VAS). In our study post operative pain was least seen with Propofol. Mild pain is seen in Propofol group while mild to moderate pain seen in Sevoflurane group patients.

Thus, from this study it is concluded that Propofol is having a beneficial effect of low incidence of postoperative nausea, vomiting and pain with compare to Sevoflurane.

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