

## Original article

# Evaluation of Postoperative Complications Occurring in Patients after Desflurane or Sevoflurane in Outpatient Anaesthesia: A Comparative Study

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## Abstract

**Background:** Desflurane and sevoflurane provide a greater degree of control of anesthetic depth and a more rapid immediate recovery from anesthesia than is currently available with other inhaled agents because of their decreased solubility. Hence; we planned the present study to assess and compare the postoperative complications occurring in patients after desflurane or sevoflurane in outpatient anaesthesia.

**Materials & Methods:** The present study included evaluation of postoperative complications occurring in patients after desflurane or sevoflurane in outpatient anaesthesia. A total of 60 patients were included in the present study. All the patients were broadly divided into two study groups as follows: Group 1: 30 patients who received desflurane for maintenance of anaesthesia, Group 2: 30 patients who received sevoflurane for maintenance of anaesthesia. Anaesthesia was induced with propofol 1.5 mg/kg IV. After loss of consciousness, the patients subsequently received either sevoflurane or desflurane with 60% nitrous oxide in oxygen. All the patients were assessed for presence of postoperative complications. All the results were compiled and analysed by SPSS software.

**Results:** Drowsiness, Nausea and vomiting, Respiratory distress, Sore throat and Headache were the various postoperative complications observed in the present study. We didn't observed any significant difference while comparing the postoperative complications in between subjects of both the study group.

**Conclusion:** In terms of postoperative complications, both the drugs are of equally effective.

**Key words:** Anaesthesia, Desflurane, Sevoflurane.

## INTRODUCTION

Desflurane and sevoflurane provide a greater degree of control of anesthetic depth and a more rapid immediate recovery from anesthesia than is currently available with other inhaled agents because of their decreased solubility.<sup>1, 2</sup> Desflurane is currently in widespread clinical use in the United States and parts of Europe. Compared with sevoflurane, it has the additional advantage of being extremely resistant to degradation and biotransformation. However, its pungent odor and tendency to irritate the respiratory tract make it unsuitable for inhalational inductions, and it has been linked to CO production in CO<sub>2</sub> absorbents.<sup>3-5</sup>

A study of patients undergoing gynecologic laparoscopy showed more rapid early recovery with desflurane than with sevoflurane; in another study of patients undergoing outpatient arthroscopy, recovery was more rapid with desflurane, but discharge was not.<sup>6,7</sup>

Hence; we planned the present study to assess and compare the postoperative complications occurring in patients after desflurane or sevoflurane in outpatient anaesthesia.

#### **MATERIALS & METHODS**

The present study was planned in the Department of Anaesthesia, DhanalakshmiSrinivasan Medical College and Hospital, Siruvachur, Perambalur, Tamilnadu (India) and it included evaluation of postoperative complications occurring in patients after desflurane or sevoflurane in outpatient anaesthesia. Written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 60 patients were included in the present study. Inclusion criteria for the present study included:

- Patients scheduled to undergo short daycare gynaecological procedures,
- Patients within the age group of 20 to 30 years,
- Patients with negative history of any known drug allergy

All the patients were broadly divided into two study groups as follows:

Group 1: 30 patients who received desflurane for maintenance of anaesthesia

Group 2: 30 patients who received sevoflurane for maintenance of anaesthesia

Detailed demographic details of all the patients were recorded. Complete pre-anaesthetic examination of all the patients was done. Complete haematological examination of all the patients was done. Prior to induction of anaesthesia, all the patients were given Tab. Alprazolam 0.25 mg and Tab. Pantoprazole 40 mg. Anaesthesia was induced with propofol 1.5 mg/kg IV. After loss of consciousness, the patients subsequently received either sevoflurane or desflurane with 60% nitrous oxide in oxygen. All the patients were assessed for presence of postoperative complications. All the results were compiled and analysed by SPSS software. Chi- square test was used for evaluation of level of significance.

#### **RESULTS**

A total of 60 patients were enrolled in the present study and were broadly divided into two study groups with 30 patients in each group. Mean age of the patients of group 1 and group 2 were 28.1 and 27.5 years respectively. Mean duration of anaesthesia among subjects of group 1 and group 2 was 59.2 and 58.2 minutes respectively. Drowsiness, Nausea and vomiting, Respiratory distress, Sore throat and Headache were the various postoperative complications observed in the present study. We didn't observe any significant difference while comparing the postoperative complications in between subjects of both the study group.

#### **DISCUSSION**

In the present study, mean duration of anaesthesia among subjects of group 1 and group 2 was 59.2 and 58.2 minutes respectively. Drowsiness, Nausea and vomiting, Respiratory distress, Sore throat and Headache were the various postoperative complications observed in the present study. We didn't observe any significant difference while comparing the postoperative complications in between subjects of both the study group. Nathanson MH et al compared the recovery characteristics of desflurane and sevoflurane when used for maintenance of ambulatory anaesthesia. After obtaining informed consent, 42 healthy, unpremedicated women undergoing laparoscopic sterilization procedures were studied. Anaesthesia was induced with propofol, 1.5-2.0 mg/kg, and maintained with either desflurane 3%-6% (n = 21) or sevoflurane 1%-2% (n = 21) with 60% nitrous oxide in oxygen. Intraoperative analgesia and neuromuscular block was achieved using fentanyl and vecuronium, respectively. The inhaled anaesthetics were titrated to achieve an adequate clinical "depth of anaesthesia" and to maintain mean arterial pressure (MAP) within 20% of the preinduction baseline values.

Visual analog scales (VAS) and the digit-symbol substitution test (DSST) were performed preoperatively and at 30-min intervals during the recovery period. There were no differences between the two groups in the total doses of propofol, fentanyl, or vecuronium. Heart rate (HR) values were lower in the sevoflurane group during the induction-to-incision period. However, HR and MAP were otherwise similar during the maintenance and recovery periods. Use of desflurane led to a more rapid emergence (4.8 +/- 2.4 vs 7.8 +/- 3.8 min) and shorter time to extubation (5.1 +/- 2.2 vs 8.2 +/- 4.2 min) compared to sevoflurane (mean values +/- SD). Intermediate recovery times, postoperative VAS and DSST scores, and side effects were similar in the two treatment groups. Although sevoflurane was associated with a slower emergence from anesthesia than desflurane after laparoscopic surgery, recovery of cognitive function and discharge times were similar in the two anesthetic groups.<sup>8</sup>Jindal R et al assessed the maintenance and emergence characteristics after anaesthesia with sevoflurane or desflurane. One hundred female patients scheduled to undergo daycare laparoscopic gynaecological surgery were enrolled for this prospective study. Patients were randomised into two groups to receive either desflurane [group I (D); n = 50] or sevoflurane [group II (S); n = 50] for maintenance of anaesthesia. The demographic data and the duration of procedure were comparable in both the groups. The early recovery time was shorter after maintenance of anaesthesia with desflurane compared with sevoflurane. However, this faster early recovery failed to lead to early readiness for home discharge. The intraoperative haemodynamic characteristics were comparable with both sevoflurane and desflurane. Both sevoflurane and desflurane provide a similar time to home readiness despite a faster early recovery with desflurane. The intraoperative haemodynamics are similar with both the agents.<sup>9</sup>

White PF et al compared the efficacy of Desflurane versus sevoflurane for maintenance of outpatient anesthesia. They randomized 130 outpatients undergoing superficial surgical procedures requiring general anesthesia to one of two maintenance anesthetic treatment groups. All patients were induced with propofol, 2 mg/kg IV, and after placement of a laryngeal mask airway, anesthesia was maintained with either sevoflurane 1%-3% or desflurane 3%-8% in an air/oxygen mixture. The inspired concentration of the volatile anesthetic was varied to maintain hemodynamic stability and a Bispectral Index value of 50-60. Analgesia was provided with local anesthetic infiltration and ketorolac (30 mg IV). Antiemetic prophylaxis consisted of a combination of ondansetron (4 mg), dexamethasone (4 mg), and metoclopramide (10 mg) at the end of surgery. The time to discharge home (90 +/- 31 min in sevoflurane and 98 +/- 35 min in desflurane, respectively) and the percentage of patients able to resume normal activities on the first postoperative day (sevoflurane 48% and desflurane 60%) did not differ significantly between the two anesthetic groups. Use of desflurane for maintenance of anesthesia was associated with a faster emergence and a higher incidence of coughing.<sup>10</sup>Welborn LG et al compared the emergence and recovery characteristics of sevoflurane, desflurane, and halothane in children undergoing adenoidectomy with bilateral myringotomy and the insertion of tubes. Eighty children 1-7 yr of age were studied. Thirty minutes prior to the induction of anesthesia, all patients received 0.5 mg/kg midazolam orally. Patients were randomly assigned to one of four groups: Group 1, sevoflurane induction and maintenance (S:S); Group 2, halothane induction and sevoflurane maintenance (H:S); Group 3, halothane induction and maintenance (H:H); or Group 4, halothane induction and desflurane maintenance (H:D). Tracheal intubation was facilitated with the use of a single dose of 0.2 mg/kg mivacurium. A Mapelson D circuit was used, and all patients received N<sub>2</sub>O:O<sub>2</sub> 60:40 for induction and maintenance at standardized appropriate fresh gas flow. Ventilation was controlled to maintain normocapnia. End-tidal concentration of anesthetics was maintained at approximately 1.3 minimum alveolar

anesthetic concentration (MAC) (halothane: 0.56; sevoflurane: 2.6; desflurane: 8.3) until the end of surgery when all anesthetics were discontinued. Emergence (extubation), recovery (Steward score 6), and discharge times were compared among patients in the four groups using analysis of variance and Newman-Keuls tests  $P < 0.05$  was considered significant. Sevoflurane resulted in similar emergence and recovery compared with halothane. Desflurane and sevoflurane did not result in faster discharge times than halothane in this patient population.<sup>11</sup>

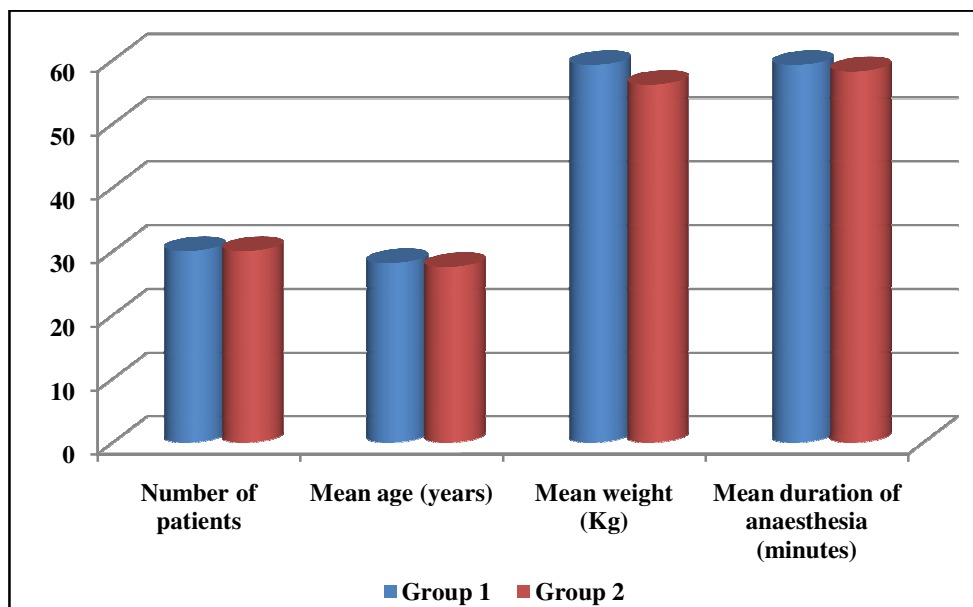
## CONCLUSION

From the above results, the authors concluded that in terms of postoperative complications, both the drugs are of equally effective. However; further studies are recommended.

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**Graph 1: Demographic details of the subjects**



**Table 1: Postoperative complications**

Postoperative complication	Group 1	Group 2	P- value
Drowsiness	6	4	0.52
Nausea and vomiting	19	22	
Respiratory distress	2	3	
Sore throat	4	2	
Headache	1	1	

**Graph 2: Postoperative complications**

