ORIGINAL RESEARCH

Sevoflurane versus Desflurane for recovery profile and airway responses

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ABSTRACT

Background: The emergence of minimally invasive surgical techniques has led to a rise in ambulatory surgeries, which in turn has increased the demand for fast tracking. The present study was conducted to compare Sevoflurane and Desfluranefor recovery profile and airway responses. **Materials & Methods:** 70 patients of both genders were divided into 2 groups of 35 each. Group I patients received sevoflurane for maintenance of anaesthesia, and group II patients received desflurane for maintenance of anaesthesia Baseline hemodynamic, and biochemical variables were evaluated. **Results:** The mean age in group I patient was 45.2 years and in group II was 45.3 years. The mean weight was 68.2 kgs and 696.1 kgs. The mean height was 174.2 cms and 175.4 cms in group I and II respectively. The difference was non- significant (P> 0.05). Opening of eyes was 10.2 minutes in group I and 6.7 minutes in group II, response to verbal commands was 13.6 minutes and 6.4 minutes, orientation to time and place was 15.8 minutes and 7.2 minutes and total recovery time was 48.2 minutes and 32.5 minutes in group I and II respectively. The difference was significant (P< 0.05). Adverse events reported were hiccups seen in 1 in group II, laryngospasm 2 in group I and 1 in group II and cough 1 in group I and 3 in group II. The difference was non- significant (P> 0.05). **Conclusion:** Desflurane is vastly better than sevoflurane. Desflurane allows for quicker awakening compared to sevoflurane, and does not lead to a rise in negative airway incidents.

Keywords: airway reflexes, Desflurane, sevoflurane

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INTRODUCTION

The emergence of minimally invasive surgical techniques has led to a rise in ambulatory surgeries, which in turn has increased the demand for fast tracking.[1] It requires an early recovery characterized by a clear mind, management of protective airway reflexes, and adequate alleviation of pain and vomiting. Consequently, it is necessary to use short-acting anaesthetic drugs in order to improve recovery quality.[2] Due to their convenience and reliable therapeutic effects, volatile anesthetics like sevoflurane and desflurane are commonly employed for general anesthesia.[3] In day surgery, sevoflurane is commonly used to maintain anesthesia due to its relatively lower solubility compared to other volatile anesthetics, which facilitates rapid emergence and recovery.[4]

Desflurane and sevoflurane provide a quicker recovery from anaesthesia than other inhaled anaesthetics due to their low solubility, as indicated by their blood-gas partition coefficients of 0.69 and 0.42, respectively.[5] While the variation in the blood-gas coefficient appears small, it has been noted that the recovery profiles of these two inhaled anesthetics differ significantly.[6]

Recent studies indicate that desflurane, as opposed to sevoflurane, results in an earlier recovery of airway reflexes. The comparative outcomes of cognitive function recovery, however, vary significantly.[7]The present study was conducted to compare Desflurane and Sevoflurane for recovery profile and airway responses.

MATERIALS & METHODS

The present study consisted of 70 patients of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 35 each. Group I patients received sevoflurane for maintenance of anaesthesia, and group II patients received desflurane for maintenance of anesthesia. Baseline biochemical and hemodynamic variables were assessed. All patients were pre-medicated with intravenous midazolam at a dosage of 0.03 mg/kg and fentanyl at 1 μg/kg. simultaneously, pre-oxygenation with 100%

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oxygen was administered, after which anaesthesia was induced with propofol. The modified Aldrete scoring system was documented.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Parameters	Group I	Group II	P value
Age (years)	45.2	45.3	0.21
Weight (kgs)	68.2	69.1	0.69
Height (cm)	174.2	175.4	0.85

Table I shows that mean age in group I patient was 45.2 years and in group II was 45.3 years. The mean weight was 68.2 kgs and 696.1 kgs. The mean height was 174.2 cms and 175.4 cms in group I and II respectively. The difference was non- significant (P> 0.05).

Table II Assessment of parameters

Parameters	Group I	Group II	P value
Opening of eyes (mins)	10.2	6.7	0.05
Response to verbal commands (mins)	13.6	6.4	0.01
Orientation to time and place (mins)	15.8	7.2	0.02
Total recovery time (mins)	48.2	32.5	0.01

Table II, graph I shows that opening of eyes was 10.2 minutes in group I and 6.7minutes in group II, response to verbal commands was 13.6 minutesand 6.4minutes, orientation to time and place was 15.8minutesand 7.2minutes and total recovery time was 48.2 minutesand 32.5 minutesin group I and II respectively. The difference was significant (P< 0.05).

Graph I Assessment of parameters

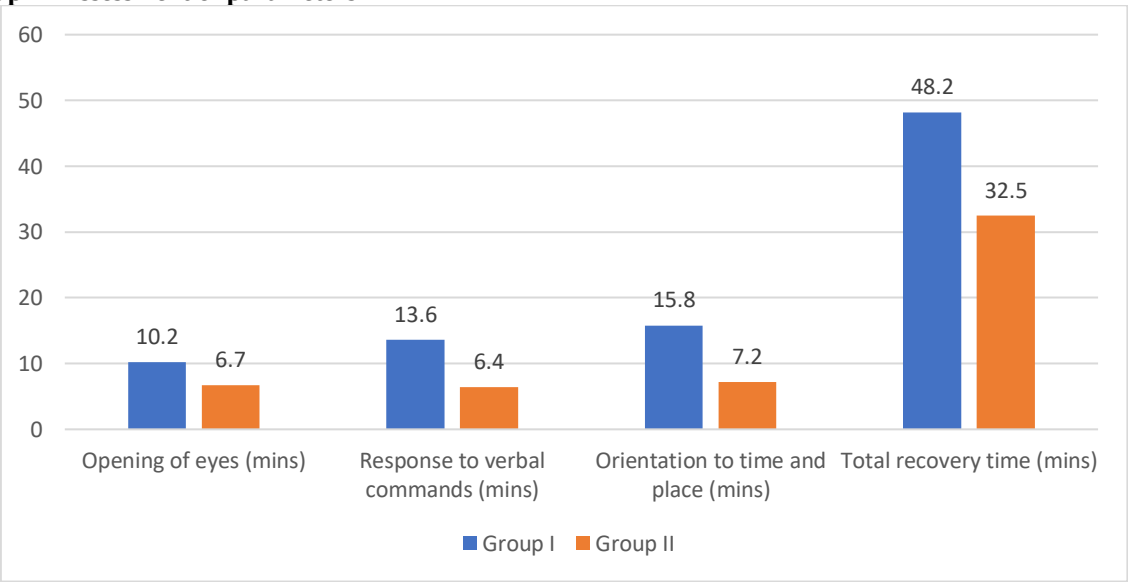

Table III Recording of adverse airway events

Adverse events	Group I	Group II	P value
Hiccups	0	1	0.23
Laryngospasm	2	1	0.94
Cough	1	3	0.57

Table III shows that adverse events reported were hiccups seen in 1 in group II, laryngospasm 2 in group I and 1 in group II and cough 1 in group I and 3 in group II. The difference was non- significant (P> 0.05).

DISCUSSION

For day care surgeries, it is desirable to recover from anaesthesia quickly.[8] Even if a person regains consciousness quickly and opens their eyes and responds to verbal commands, the risk of aspiration-related pulmonary complications remains.[9,10] Inhalational anaesthetics that ensure a smooth and quick induction, optimal surgical conditions, and fast recovery while minimizing side effects such as nausea, vomiting, bleeding, postoperative pain, and cognitive dysfunction are suitable for this purpose.[11]The present study was conducted to

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compare Desflurane and Sevoflurane for recovery profile and airway responses.

We found that mean age in group I patient was 45.2 years and in group II was 45.3 years. The mean weight was 68.2 kgs and 696.1 kgs. The mean height was 174.2 cms and 175.4 cms in group I and II respectively. Jadhav et al[12] in their study 50 patients above 65 years of age falling into ASA Grade 1, 2, or 3 were divided into 2 groups, one (Group A) wherein sevoflurane was given as the anesthetic agent and the other (Group B) where desflurane was administered. All had undergone physical and regular blood examination. MMSE score was taken for all patients for cognitive recognition before surgery and 1, 3, and 6 hours after surgery. Of the 50 patients, the MMSE score was above 27 for all before surgery, while, post-surgery it was below 27 after I hour in 100% of the cases. After 3 hours, in Group A, the mean MMSE was above 27 while it was still below 27 in Group B while it was above 27 in both the Groups after 6 hours post-surgery. There was only 1 case of POCD after 6 hours in Group A and none in Group B. The recovery time was faster in Group B as compared to Group A.

We found that opening of eyes was 10.2 minutes in group I and 6.7 minutes in group II, response to verbal commands was 13.6 minutes and 6.4 minutes, orientation to time and place was 15.8 minutes and 7.2 minutes and total recovery time was 48.2 minutes and 32.5 minutes in group I and II respectively. Mckay et al[13] tested whether the use of a more pungent anesthetic (desflurane) would result in a higher rate of coughing, breath holding, laryngospasm, or desaturation among patients who smoke. They randomly assigned 110 smokers to anesthesia with desflurane (n = 55) or sevoflurane (n = 55), administered via a laryngeal mask airway. Five patients (9%) receiving desflurane and nine patients (16%) receiving sevoflurane coughed (P = 0.39). Most coughing occurred during induction (33%) or emergence (56%), in the setting of airway manipulation and low anesthetic concentration. The rate of breath holding, laryngospasm, and desaturation was similar between those receiving desflurane versus sevoflurane.

We found that adverse events reported were hiccups seen in 1 in group II, laryngospasm 2 in group I and 1 in group II and cough 1 in group I and 3 in group II. Dalal et al[14] compared desflurane and sevoflurane with respect to recovery and occurrence of adverse airway responses in spontaneously breathing patients while using the ProSeal™ laryngeal mask airway (LMA). Ninety-four adult patients undergoing hysteroscopic procedures were divided into sevoflurane (S) group or desflurane (D) group. Patients were premedicated with midazolam 0.03 mg/kg and fentanyl 1μg/kg. Anaesthesia was induced with propofol 2.0–2.5 mg/kg, followed by insertion of a ProSeal™ LMA. Adverse airway responses such as cough, hiccups, laryngospasm and breathholding were recorded. In the post-operative period: time to awakening, response to verbal commands, orientation, ability to sit with support and the recovery room Aldrete score were recorded. Three patients in group S (6.4%) and six patients (13.3%) in Group D had adverse airway events. The mean time to eye opening (Group S-10.75 ± 7.54 min, Group D-4.94 ± 1.74 min), obeying verbal commands (Group S-13.13 ± 8.75 min, Group D-6.55 ± 1.75 min), orientation (Group S-15.42 ± 8.46 min, Group D-6.23 ± 2.4 min) and to sit with support (Group S-36.09 ± 12.68 min, Group D-14.35 ± 3.75 min) were found to be lesser with desflurane than with sevoflurane. The mean time to recovery was delayed in Group S-46.00 ± 12.86 minutes compared to Group D-26.44 ± 5.33 minutes. The limitation the study is small sample size.

CONCLUSION

Authors found that desflurane is vastly better than sevoflurane. Desflurane allows for quicker awakening compared to sevoflurane, and does not lead to a rise in negative airway incidents.

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