



Subject Area : Anaesthesia

A COMPARISON OF EARLY RECOVERY PROFILE OF DESFLURANE VERSES SEVOFLURANE IN LAPAROSCOPIC CHOLECYSTECTOMY

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ARTICLE INFO	ABSTRACT
Article History: Received 10 th March 2024 Received in revised form 19 th March, 2024 Accepted 12 th April, 2025 Published online 28 th April, 2025	Background: Lower blood:gas partition coefficient of Sevoflurane and Desflurane facilitates a faster emergence from anaesthesia as compared to traditional agents. Desflurane has demonstrated a rapid early recovery profiles as compared to Sevoflurane. Material and Methods: ASA grade I, II patients, undergoing laparoscopic cholecystectomy were randomly assigned to receive Desflurane ($n=30$) or Sevoflurane ($n=30$). The time required for extubation, eye opening, verbal response and achievement of a modified Aldrete score of 9 were recorded. Results: The time required for extubation and for eye opening was shorter in the Desflurane group as compared to the Sevoflurane group [12.0 ± 5.0 min versus 14.0 ± 5.0 min and 7.0 ± 4.0 versus 11.0 ± 5.0]. Verbal Response also occurred significantly faster in the Desflurane group [$10.0 \text{ min} \pm 4.0$ versus 12.0 ± 5.0 min]. A modified Aldrete score of ≥ 9 significantly sooner [13.0 ± 5.0 min versus 19.0 ± 5.0 min] than the Sevoflurane group. The frequency of adverse effects was not significantly different in either of the groups. Conclusion: Desflurane has early recovery from anaesthesia as compared to the Sevoflurane group.
Key words: Desflurane, Early recovery, Sevoflurane	
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INTRODUCTION

Laparoscopic Cholecystectomy is carried out as ambulatory surgery. Sevoflurane and Desflurane are inhalational anaesthetic agents with low blood/gas solubility (0.69 and 0.42, respectively) and low fat/blood solubility (48 and 27, respectively), which allows rapid recovery from anaesthesia making them choice of inhalational anaesthetic agent for ambulatory surgeries. Out of the two, Desflurane causes rapid early recovery of patient as compared to Sevoflurane⁵.

MATERIAL AND METHODS

After approval from the Institutional Ethics Committee, 60 patients belonging to ASA I and II between the age 20 to 60 years, undergoing laparoscopic cholecystectomy were divided into two groups receiving either Sevoflurane (Group S) or Desflurane (Group D) as the inhalational anaesthetic agent. Patients with history of drug allergy, morbid obesity, hiatal hernia, cardio-pulmonary, hepatic, renal dysfunction, endocrine or neurological dysfunction were excluded from study. NBM status was confirmed. Written informed consent was taken. IV line was secured. Monitors were attached. Patient was given inj. ondansetron 0.1 mg/kg iv and inj. pantoprazole

40 mg iv. Patients received iv. glycopyrrolate 0.2 mg, iv. midazolam 1 mg, fentanyl citrate 2 μ g/kg body weight. After preoxygenation, anaesthesia was induced with inj. propofol 2 mg/kg iv., with iv. succinylcholine 2 mg/kg. Patient was ventilated and intubated. Maintenance with O₂+N₂O with either Sevoflurane [MAC 2%] or Desflurane [MAC 6%]⁸. P₈, BP, ECG, SPO₂, ETCO₂ and Urine output were monitored. Analgesia in the form of iv. inj. paracetamol 15 mg/kg was given before end of surgery. The primary anaesthetic was discontinued after the last skin suture was placed. Patient was reversed with i.v. glycopyrrolate 0.008 mg/kg and neostigmine 0.05 mg/kg. Aldrete score was recorded at extubation and then at 1, 3, 5, 10, 15 minutes, and further on until the patient achieved an Aldrete score of 9. The time of the first incidence of eye opening, that of first verbal response and any untoward events if any did occur, in the form of excessive secretions, coughing, or bronchospasm were also recorded. On achieving an Aldrete score of ≥ 9 , patients were shifted to the post-anaesthesia care unit (PACU). Oxygen was administered via mask at 4–6 L/minute.

RESULTS

Patients parameters including age, sex, body mass index, and ASA (American Society of Anaesthesia) classification, were comparable in both the groups. The total duration of surgery also did not differ significantly between the two groups.

Haemodynamic parameters like P and BP were comparable in

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both the groups.

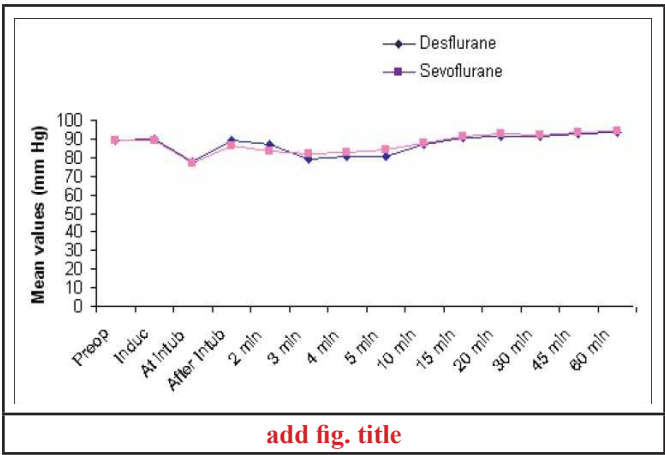
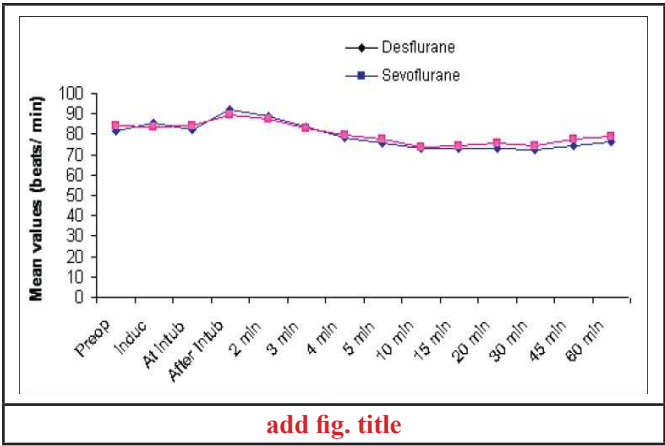


Table 1. add table title

Recovery variables	Group D	Group S
Time for eye opening (min)	7.0±4.0	11.0±5.0
Time for Verbal response (min)	10.0±4.0	12.0±5.0
Time for extubation (min)	12.0±5.0	14.0±5.0
Time for Modified Aldrete score >9	13.0±5.0	19.0±5.0

The time required for extubation and for eye opening was significantly shorter in the Desflurane group as compared to the Sevoflurane group [12.0+ 5.0 min versus 14.0+5.0,7.0±4.0 minversus 11.0±5.0 min]. Verbal Response also occurred significantly faster in the Desflurane group [10.0±4.0 min versus 12.0±5.0].A modified Aldrete score of ≥9 is seen in Desflurane [13.0±5.0 versus 19.0±5.0] than in the Sevoflurane group. There was significant difference in time for eye opening,time for verbal response and time of extubation between desflurane and sevoflurane group (P < 0.05). There was significant difference in time for Modified Aldrete score >9 between desflurane and sevoflurane group (P < 0.05).

Table 2. Complications add table title		
Complications	Desflurane	Sevoflurane
Broncospasm	1	0

complications such as secretions, coughing, and bronchospasm was not statistically significant in both the groups.

DISCUSSION

The Desflurane and Sevoflurane provides better intraoperative anaesthesia and a rapid postoperative recoverydue to lower blood/gas partition coefficients resulting in early recoveryin laparoscopic cholecystectomy.

Patients parameters including age, sex, body mass index, and ASA (American Society of Anaesthesia) classification, were comparable in both the groups. The total duration of surgery also did not differ significantly between the two group. Hae-modynamic parameters like P and BP were comparable in both the groups La Colla L, Albertin A et al11 found that the intraoperative haemodynamic characteristics were comparable with both sevoflurane and desfluranegroup.

In our study it was found that the time required for extubation and for eye opening was significantly shorter in the Desflu-rane group as compared to the Sevoflurane group2,3 [10.0±4.0 versus 12.0±5.0 and 7.0±4.0 min versus 11.0±5.0min]. Verbal Response also occurred significantly faster in the Desflurane group [10.0±4.0 min ± versus 12.0±5.0min] than the Sevoflu-rane group. A modified Aldrete score of ≥9 is seen in Desflu-rane group [12.0±5.0 min versus19.0±5.0 min] than the Sevo-flurane group.

Patients receiving Desflurane got extubated sooner than those receiving Sevoflurane.Gauri R. Gangakhedkar1 Joseph N. Monteiro et al found that in laparoscopic cholecystectomy,the time required for extubation and for eye opening was signif-icantly shorter in the Desflurane group as compared to the Sevoflurane group [9.1 min ± 5.0 versus 12.5 min ± 7.1, P = 0.049 and 10.1 min ± 5.2 versus 6.3 min ± 4.0, P = 0.008]. Verbal Response also occurred significantly faster in the Des-flurane group [12.7 min ± 5.4 versus 8.7 min ± 4.7, P = 0.002]. A significantly higher mean modified Aldrete score was seen at extubation [7.1 ± 0.6 vs 6.0 ± 0.8, P < 0.001] in the Des-flurane group, which also achieved a modified Aldrete score of ≥9 significantly sooner [11.1 min ± 4.6 versus 17.8 min ± 6.9, P < 0.001] than the Sevoflurane group.La Colla L11, Al-bertin A et al found that Desflurane provides faster wash-in and wash-out than sevoflurane in morbidly obese patients, and recovery is much faster after desflurane administration when no premedication has been used6,7. Paul F White 10, Jun Tang et al found that despite the faster initial recovery with desflu-rane, no significant differences were found between the two volatile anaesthetics in the later recovery period.

La Colla L, Albertin A et al 11 found that Response to painful stimuli was seen in 2.75 (1.411) in D group and 4.02 (1.767) in D group Response to verbal commands in 3.48 (1.488) in D group 5.04 (1.616) in S group. Time to achieve modified aldrate score of 9 Readiness to home discharge10.80 (3.774) in D group 16.20 (3.870) in D group.La Colla et al11 used remifentanyl and cis-atracurium to shorten the period required for recovery. Only onepatient had respiratory complications (bronchospasm) in the peri-extubation period in whom desflu-rane was used, the number is not statistically significant. This finding was supported by a number of studies.[14,15,10] inci-dence of untoward events like excessive secretions, coughing, or bronchospasm is not statistically significant in both groups. Gauri R Gangakhedkar1, Joseph N Monteiro observed that the frequency of adverse effects was not significantly different in either of the groups. La CollaL,Albertin A et al.11found that

the incidence of postoperative complications was also similar in both the groups

CONCLUSION

Desflurane has early recovery profile than that of Sevoflurane in patients undergoing laparoscopic cholecystectomy.

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