Usefulness of an anesthetic conserving device (AnaConDa™) in sevoflurane-nitrous oxide anesthesia

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Backgrounds: Anesthetic conserving device (AnaConDa™, Sedana Medical, Sundbyberg, Sweden) is reported to decrease consumption of sevoflurane and fasten emergence from anesthesia when used with sevoflurane 0.3 to 0.5%. The present study was performed to compare sevoflurane consumption, emergence time and side effects between using AnaConDa™ and conventional vaporizer at higher sevoflurane concentration (1.5 to 2.0%) in sevoflurane-nitrous oxide anesthesia.
Materials and Methods: Twenty-four patients aged 20 to 80 years for ear surgery were randomly divided into two groups. Anesthesia was induced with midazolam 0.1 mg/kg, fentanyl 4 μg/kg and propofol 2 mg/kg. Tracheal intubation was facilitated with vecuronium 0.15 mg/kg. Anesthesia was maintained with sevoflurane 1.5 to 2.0% (end-tidal concentration) and nitrous oxide 2 L/min in oxygen 2 L/min. In the AnaConDa group, the AnaConDa™ was set between anesthesia circuit and tracheal tube with sampling tubes of end-tidal gas concentration in both sides. Infusion of sevoflurane was started at 25 mL/h and when end-tidal sevoflurane was detected, infusion rate was decreased to 10 mL/h, and then infusion rate was controlled to keep end-tidal sevoflurane concentration between 1.5 to 2.0%. In the control group, vaporizer setting was controlled to keep 1.5 to 2.0% end-tidal sevoflurane concentrations. At the end of surgery, sevoflurane and nitrous oxide were stopped and 100% oxygen 6 L/min was administered. The AnaConDa™ was removed from the circuit. Sevoflurane consumption, time from start of sevoflurane administration to detect end-tidal sevoflurane, emergence time (time from stop of sevoflurane to extubation), and side effects were compared between the two groups.
Results: Results are shown as mean ± standard deviation in the table. Decrease of sevoflurane concentration after stopping its administration was faster in the AnaConDa group. No side effects were observed in both groups.
Conclusions: We could save sevoflurane and fasten emergence from anesthesia with AnaConDa™ compared to using conventional vaporizer when sevoflurane was administered at 1.5 to 2.0%.

	AnaConDa group	Control group

Duration of sevoflurane administration (min)	218 ± 90	219 ± 73
Sevoflurane administration (MAC · h)	3.7 ± 1.6	3.7 ± 1.4
Total consumption of sevoflurane (mL)	26.5 ± 10.7*	106.5 ± 38.7
Sevoflurane consumption per minute (mL)	0.12 ± 0.02*	0.49 ± 0.09
Time to detect end-tidal sevoflurane (sec)	203 ± 92*	28 ± 4
Emergence time (min)	8 ± 4*	14 ± 2

*: $P < 0.05$ vs. the Control group, MAC, minimum alveolar concentration

Summary

The present study was performed to compare sevoflurane consumption, emergence time and side effects between using an anesthetic conserving device (AnaConDa™) and conventional vaporizer at high sevoflurane concentration (1.5 to 2.0%) in sevoflurane-nitrous oxide anesthesia. The AnaConDa™ could save sevoflurane consumption and fasten emergence from anesthesia without any observable side effects.