

KLİNİK ARAŞTIRMA**ÇOCUK ADENOTONSİLLEKTOMİ ANESTEZİSİNDE
DESFLURAN VE SEVOFLURAN:
Derlenme Süresi ve Postoperatif Komplikasyon
Oranlarının Karşılaştırılması**

DESFLURANE AND SEVOFLURANE ANESTHESIA IN CHILDHOOD
ADENOTONSILLECTOMY: A Comparison Regarding of Recovery Time and Postoperative
Complication Rate

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ÖZET

Amaç: Çocuklardaki adenotonsillektomilerde desfluran ve sevofluran'ın postoperatif derlenme özellikleri ve komplikasyon oranlarını karşılaştırmak.

Gereç ve Yöntem: ASA skoru I olup soğuk bıçak tonsillektomi ve adenoid küretaj ameliyatında anestezi ajanı olarak desfluran (27) ve sevofluran (27) kullanılan, 54 çocuk geriye dönük değerlendirildi. Her iki ajanla anestezi sonrasında derlenme ve göz açma süreleri ile postoperatif kusma, öksürük ve laringospazm oranları karşılaştırıldı.

Bulgular: Ortalama yaş desfluran grubunda 6 ± 0.41 (3-11), -11 kız, 16 erkek- ve sevofluran grubunda ise 6 ± 0.46 (3-12), -9 kız, 18 erkek- olarak hesaplandı. Her iki grup arasında yaş, cinsiyet, vücut kitle indeksi ve operasyon süresi açısından istatistiksel olarak anlamlı fark yoktu ($p>0.05$). Ortalama göz açma süresi desfluran kullanılan olgularda 3.3 ± 0.3 (1.3 - 7.5) dakika, sevofluran kullanılan olgularda 6.3 ± 0.5 (2.5 - 10.5) dakika olarak ölçüldü. Desfluran grubunda göz açma süresi istatistiksel olarak anlamlı oranda kısa bulundu ($p=0.03$, $p<0.05$). Derlenme süreleri 35.56 dakika (desfluran) ve 34.67 dakika (sevofluran) ile her iki grupta birbirine yakın olarak saptandı ($p=0.07$, $p>0.05$). Postoperatif kusma, öksürük ve

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laringospasm oranları her iki anestezi ajanı için istatistiksel olarak fark göstermedi. P değerleri sırasıyla 0.55, 0.48, ve 0.15 olarak bulundu.

Sonuç: Desfluran ve sevofluran anestezi ile derlenme ve postoperatif komplikasyonlar arasında anlamlı fark saptanmadı. Yalnızca göz açma süresi desfluran grubunda istatistiksel olarak anlamlı oranda kısa idi.

Anahtar Sözcükler: Adenotonsillektomi, Derlenme, Desfluran, Sevofluran

SUMMARY

Aim: To evaluate the recovery profiles and postoperative adverse events after general anesthesia with desflurane and sevoflurane in childhood adenotonsillectomy.

Material and Methods: Fiftyfour children, ASA physical status I, underwent conventional cold tonsillectomy and curettage adenoidectomy under general anesthesia with desflurane (n = 27) and sevoflurane (n =27) were evaluated retrospectively. Anesthesia recovery, eye opening, postoperative vomiting, coughing and laryngospasm were compared for two anesthetic regimens.

Findings: The mean age was 6±0.41 (min-max: 3-11, 11 female, 16 male) in desflurane group and 6±0.46 (min-max: 3-12, 9 female, 18 male) in sevoflurane group. No significant difference was observed between the two groups in terms of age, gender, body mass index and operation duration (p>0.05) The mean time to eye opening following desflurane was 3.3±0.3 (1.3 - 7.5) minutes versus 6.3±0.5 (2.5-10.5) minutes following sevoflurane, difference was statistically significant (p=0.03, p<0.05). Recovery of both agent is similar, 35.56 minutes in desflurane 34.67 minutes in sevoflurane (p=0.07, p>0.05). There was no statistical difference in the postoperative vomiting, coughing, and laryngospasm, among two groups. P values were 0.55, 0.48, and 0.15 respectively.

Conclusion: The occurrence of recovery and adverse events between desflurane and sevoflurane were not significantly different, except that the eye opening duration after anesthesia was significantly shorter in desflurane group.

Key words: Adenotonsillectomy, Desflurane, Recovery, Sevoflurane

INTRODUCTION

Desflurane and sevoflurane are new volatile agents that are used by anesthesiologists in recent years. The advantages of these drugs are that, low blood solubility which provides faster anesthetic effect and rapid recovery than isoflurane (1, 2,12). However, indications and contraindications are almost similar to each other.

Postoperative vomiting is the most common complication after surgery especially after adenotonsillectomy. In addition, postoperative vomiting is still the most important stress factor that delays the recovery of the patient and increases the cost of the anesthesia process (3). In anesthetized patients, increased upper airway reactivity may manifest by coughing when the cough reflex is initiated (4).

Reflex glottic closure is a dominant and stable reflex produced by the stimulation of the superior laryngeal nerve. Laryngospasm is an exaggeration of this response and also more common after upper airway procedures (5).

The aim of this study, compare the effect of desflurane and sevoflurane on eye opening, recovery time, postoperative vomiting, coughing, and laryngospasm in children who underwent adenotonsillectomy.

MATERIALS AND METHODS

54 children, ASA physical status I (34 male and 20 female, 27 were anaesthetised with desflurane and 27 were anaesthetised with sevoflurane) who underwent conventional cold tonsillectomy and curettage adenoidectomy were analysed retrospectively. None of the patients had a history of sleep apnea, developmental delay, or psychological disorders.

Patients were not premedicated. An IV catheter was placed, anesthesia was induced with propofol 2 mg/kg and mivacurium 0.25 mg/kg was given to facilitate endotracheal intubation Anesthesia was maintained by an inhaled technique consisting of nitrous oxide/oxygen (70%:30%) and patients received either desflurane 4%–6% or sevoflurane 1.5%–2.0% via the endotracheal tube. Ventilation was controlled to maintain an end-tidal CO₂ of 35 ±4 mm Hg.

Coughing seven times during 6 minutes of post-extubation period was accepted as postoperative adverse event. The occurrence of laryngospasm that resolved without treatment was also considered as an adverse event. Recorded eye opening and the recovery time, postoperative vomiting, coughing, and laryngospasm were compared for both group.

Statistical analysis was performed using SPSS® 20.0 software (SPSS Inc., Chicago, IL, USA). Between two groups, mean time to eye opening and recovery from anesthesia were compared by unpaired t test. Chi-square test and Fisher's exact test were used for non-parametric data including vomiting, coughing and laryngospasm. $P < 0.05$ was considered to be statistically significant.

RESULTS

54 patients were recruited for the study. The mean age was 6 ± 0.41 (min-max: 3-11, 11 female, 16 male) in desflurane group and 6 ± 0.46 (min-max: 3-12, 9 female, 18 male) in sevoflurane group. No significant difference was observed between the two groups in terms of age, gender, body mass index and operation duration ($p > 0.05$). Spontaneous eye opening time were meanly 3.3 ± 0.3 (1.3-7.5) minute in desflurane and 6.3 (2.5-10.5) minute in sevoflurane group with statistically significance. Anesthesia recovery time was 35.56 minutes in desflurane group and 34.67 min in sevoflurane group without statistically significance. No difference between the two groups were found in vomiting, coughing and laryngospasm (Table 1). There was no statistically significance in the postoperative adverse events.

DISCUSSION

It is desirable to have a fast recovery from anaesthesia and less postoperative complications. The current findings are consistent with previously published comparative studies demonstrating that the faster emergence from desflurane (versus sevoflurane) anaesthesia failed to lead to an earlier discharge from hospital after both outpatient and inpatient surgical procedures (6-9).

The study by Nathanson suggested that sevoflurane and desflurane provided similar intraoperative conditions during the maintenance period. Although early recovery was faster with desflurane, there was no difference in the intermediate recovery end points (6). Loop also found that late recovery profiles and incidence of postoperative side effects were similar after desflurane and sevoflurane administration (7). Welborn concluded that despite the faster initial recovery with desflurane, no significant differences were found between the two volatile anaesthetics in the later recovery period (8). Isik and others also concluded that in children, early recovery was faster with desflurane compared to sevoflurane (9). Findings of the present study are consistent with the earlier reported data of faster early recovery with desflurane compared to sevoflurane.

Side effects are important during anesthesia. The incidence complications as postoperative nausea and vomiting, headache, cough and laryngospasm can affect the duration and prognosis of anesthesia and patients comfort. Karlsen found that the postoperative nausea/vomiting rate was higher in the desflurane group than that in sevoflurane group (1). Goff found most frequent side effect after surgery as nausea and vomiting. Although the incidence of cough was more in the desflurane group, the difference was not statistically significant ($p > 0.05$) (10). Eshima found that sevoflurane does not irritate the respiratory tract, whereas desflurane can do so at concentrations that exceed the minimum alveolar anesthetic concentration (11).

In our study, There was a significant difference in time to eye opening with desflurane compared to sevoflurane. Recovery time was faster in desflurane group. Our study found no difference in the incidence of respiratory complications between the two groups. The incidence of other postoperative complications (postoperative nausea and vomiting, headache, drowsiness) was also similar in both of the groups. Cough was seen more in desflurane group without any significance.

Table 1.

	Desflurane (27)	Sevoflurane (27)	P value
Time to Eye Opening (sec)	199.4	379.1	0.003
Time to Recovery from Anesthesia (min)	35.56	34.67	0.168
Vomiting	3	3	0.552
Cough	6	3	0.273
Laryngospasm	1	2	0.150

CONCLUSION

Desflurane had a shorter eye opening duration than sevoflurane. In general anesthesia both of them can be preferred with similar postoperative incidence of complications.

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