

**TITLE:** NITROUS OXIDE DOES NOT INCREASE POSTOPERATIVE NAUSEA/VOMITING IN PEDIATRIC OUTPATIENTS UNDERGOING TONSILLECTOMY-ADENOIDECTOMY

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**INTRODUCTION:** The high incidence of nausea, vomiting, and retching (N/V/R) after outpatient anesthesia is still a major problem both in adult as well as in pediatric practice. Following the first suggestion by Alexander, associating nitrous oxide with a higher incidence of N/V, a number of papers have been published on the subject. These investigations limited to adults, only succeeded in increasing the controversy. There are no trials reported in children. Postoperative nausea and vomiting can approach 80%, especially following procedures such as tonsillectomy, orchidopexy and strabismus correction in pediatric outpatients. The aim of the present study was to determine whether the routine use of nitrous oxide (in either low or high concentrations) increases the incidence of N/V after anesthesia for tonsillectomy and/or adenoidectomy (T&A) in pediatric outpatients.

**METHOD:** Institutional Ethical Committee approval and parental written informed consents were obtained. One hundred and thirty six children (2-17 years of age) scheduled for outpatient T & A's were studied. No pharmacological premedication was used. Anesthesia was induced in all children with nitrous oxide, oxygen and halothane via a face mask. After induction, each child received atropine 0.01 mg/kg and fentanyl 2.0 ug/kg intravenously. Tracheal intubation was facilitated by vecuronium 0.1 mg/kg. For maintenance of anesthesia the children were randomly divided into four groups as follows: Group 1: 100% oxygen; Group 2: 30% oxygen in air mixture; Group

3: 40% nitrous oxide in oxygen; Group 4: 70% nitrous oxide in oxygen. At the end of the operation the stomach was aspirated, neuromuscular blockade reversed and the trachea extubated. Patients were observed in the recovery room by a nurse blinded to the anesthetic technique: both emetic complications and emergence sequelae were recorded. Supplemental intravenous morphine analgesia was administered as deemed necessary by the nurse; similarly, distressing emesis was treated with either intravenous droperidol or rectal prochlorperazine. Parents were called 24 hours later to ascertain the incidence of N/V and other side effects at home. The four groups were compared using either ANOVA or Chi-squared.

**RESULTS:** There were no demographic differences between the four groups, nor were there any differences between the durations of anesthesia or hospital stay. There were no differences in the incidence of emergence phenomena. Postoperative morphine requirements in all groups were similar (0.08 mg/kg average). The incidence of postoperative N/V/R during the various phases of recovery, together with antiemetic requirements are shown in table 1. There were no statistically significant differences between the four groups.

**DISCUSSION:** The results of this ongoing study show no statistically significant increase in the incidence of postoperative nausea and vomiting after nitrous oxide, in children undergoing T & A's. Our results support the results from a number of studies in adults. Furthermore, we found that, neither the concentration of nitrous oxide (70% or 40%), nor the concentration of oxygen (100% or 30%) used as the carrier gas, made any difference in the emetic outcome.

TABLE 1	Group 1 (n=34)	Group 2 (n=32)	Group 3 (n=36)	Group 4 (n=34)
N/V in Hospital (%)	13 (38)	11 (34)	20 (56)	13 (38)
N/V in Home (%)	17 (50)	18 (56)	20 (57)	22 (64)
N/V Overall (%)	22 (65)	19 (59)	27 (75)	26 (76)
Given antiemetics (%)	0 (0)	4 (13)	3 (8)	5 (12)

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**TITLE:** INDUCTION AND RECOVERY CHARACTERISTICS OF DESFLURANE IN INFANTS AND CHILDREN

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**INTRODUCTION:**

Desflurane (DF) is a new inhalation anesthetic which has a low blood-gas partition coefficient (0.42) that produces a rapid uptake and elimination<sup>1,2</sup>. These favorable properties indicate that it may be a useful drug for pediatric ambulatory anaesthesia. Therefore, we investigated induction and recovery characteristics of DF in infants and children.

**METHODS:**

With Institutional Ethical approval and parental consent the induction and recovery characteristics of DF in 29 unpremedicated, ASA physical status 1 or 2, infants and children were studied. Anesthesia was induced with DF in oxygen. After tracheal intubation during deep DF anesthesia in oxygen, anesthesia was maintained with 7-12% DF and 60% N<sub>2</sub>O in oxygen. Ventilation was controlled to maintain normocapnia. Airway reflexes and responses to DF were recorded during induction of anesthesia, tracheal intubation and at extubation. The times to loss of eyelash reflex and intubation from the start of DF were recorded. The times to eye opening and extubation after discontinuation of DF were also recorded. The end-tidal concentration of DF was recorded at intubation and extubation.

**RESULTS:**

The patients ranged from 2 months to 12 yrs in age. The time to loss of eyelash reflex was  $1.4 \pm 0.5$  minutes. Untoward airway reflexes responses during induction included breath-holding for >15 seconds (41% of patients), pharyngeal secretions that required suctioning (10%). Severe laryngospasm, (defined as that requiring succinylcholine) occurred in 2 children (7%). Bronchospasm did not occur in any patient. The time from commencement of DF to intubation [mean  $\pm$  SD] was  $5.0 \pm 1.0$  minutes and intubating conditions were good in all patients. The end-tidal concentration of DF was  $12.0 \pm 1.9\%$  at intubation. All children experienced a period of excitement during induction. Duration of surgery was  $31.4 \pm 19.1$  minutes. The time from discontinuation of DF to extubation was  $7.7 \pm 4.4$  minutes and to eye opening was  $5.0 \pm 1.6$  minutes. The end-tidal concentration of DF at extubation was  $0.34 \pm 0.21\%$ . Analgesia, was administered in the PAR, as indicated using an objective pain score. All patients were discharged within 80 minutes of discontinuation of DF.

**DISCUSSION:**

We conclude that DF is a mildly irritant volatile anesthetic agent. Induction of anesthesia with DF in oxygen produces a rapid onset and recovery of anesthesia with mild irritation of the airway and a brief excitement period in infants and children.

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**REFERENCES:**

1. Eger et al. Anesth-Analg. 67;1174-6, 1988
2. Smiley et al. Anesth-Analg. 70;S378, 1990