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AMBULATORY ANESTHESIA I

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TITLE: Postoperative Nystagmus and Emesis

AUTHORS: GE Larijani, PharmD, I Gratz, DO, S Berman, PhD, S. Zwillenberg, MD

AFFILIATION: Departments of Anesthesiology, Audiology, Otolaryngology and Pharmacology, Medical College of PA, Philadelphia, PA

INTRODUCTION: Nausea and vomiting are common sequelae of general anesthesia particularly in ambulatory patients. Temporary disturbances in vestibular function have been implicated as a causative factor in the development of postoperative emesis. This study was designed to detect the presence of postoperative nystagmus and correlate this finding with postoperative emesis.

METHOD: Written informed consents were obtained from ASA I-II ambulatory patients scheduled for elective surgical procedures under general anesthesia to participate in this IRB approved study. No attempt was made to standardize the premedication or the anesthetic technique except for exclusion of perioperative antiemetics. In the recovery room and the short procedure unit, the patients were tested for the presence of nystagmus using a standard electronystagmograph (ENG). Two electrodes were placed lateral to the outer canthus of the eye with a ground electrode placed on the forehead. The ENG was calibrated for each reading by asking the patient to look at 2 different targets placed 4 feet away at 30 degrees to the left and to the right. Eye motion was measured by asking the patient to follow the movement of a pen from side to side (pendular tracking) and after closing the eyes and moving the head side to side (Hallpike maneuver). Patients were frequently observed for the presence of nausea and vomiting while in the hospital. A telephone call 24 hrs later was also made for evaluation of emetic symptoms at home. Data was analyzed using 95% CI and is reported as mean (SD).

RESULTS: 42 patients (31 female) participated in this study. All patients except one had received thiopental, N_2O/O_2, midazolam, isoflurane, fentanyl and a muscle relaxant for their anesthetic management. As expected significantly more female than male patients complained of postoperative nausea in the hospital (13 of 31 vs. 1 of 11, 95% CI = 8.6% to 57.1%) or at home (11 of 31 vs. 1 of 11, 95% CI = 2.5% to 50.3%). Furthermore, significantly more patients complaining of postoperative nausea in the hospital had nystagmus than those who did not (10 of 14 vs. 8 of 28, 95% CI = 14% to 72%). In addition, significantly more patients who had nystagmus complained of emesis at home as compared to those who did not have nystagmus (9 of 18 vs. 3 of 24, 95% CI = 11% to 64%).

DISCUSSION: Postoperative nystagmus is significantly more common in patients who complain of postoperative nausea and vomiting during the first postoperative day. The presence of nystagmus in these patients is another indication that temporary disturbances in vestibular function caused by anesthetics is an important factor in the development of postoperative emesis.

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VOMITING AFTER ALFENTANIL - EFFECT OF DOSING METHOD

G Okum MD, P Colonna-Romano MD, JC Horrow MD
Dept. of Anesthesiology, Hahnemann Univ, Phila., PA 19102

Administration of alfentanil by infusion, as opposed to intermittent bolus, permits more rapid awakening and less frequent use of naloxone.[1] Nausea and vomiting (NV) also may be related to the mode of administration. We tested this hypothesis with a double blind, randomized study in patients at high risk for NV.[2-3]

METHODS

With IRB approval, 40 women for elective lower abdominal gynecologic or laparoscopic procedures, ASA I or II, gave informed consent for sequential randomization to a bolus (B) or an infusion (I) group. All patients received iv glycopyrrolate, methohexital, and vecuronium at induction of anesthesia. N_2O in O_2 and vecuronium maintained anesthesia and muscle relaxation. Group B patients received alfentanil 30 $\mu g \cdot kg^{-1}$ iv push on induction followed by 10 $\mu g \cdot kg^{-1}$ iv push every 10 min until conclusion of their procedure. Group I received alfentanil as 30 $\mu g \cdot kg^{-1}$ over 1 min, followed by 1 $\mu g \cdot kg^{-1} \cdot min^{-1}$ until conclusion of surgery. During recovery, a nurse blinded to the patient's group assignment assessed her for the presence of NV, need for anti-emetics, and prolonged recovery room (PACU) stay. Patients who vomited more than once or who complained of nausea after vomiting received prochlorperazine or benzquinimide. Prolonged PACU stay was defined as >2 hrs. Two-tailed unpaired Student's t-test compared demographic data. Multinomial logistic regression analyzed the contributions of group, kind of surgery, and their interaction on NV, anti-emetic use, and prolonged PACU stay.

RESULTS

Patient groups did not differ with respect to demographic variables. Laparoscopy accounted for 16 procedures; the remaining 24 featured either an abdominal or vaginal incision. Multinomial logistic regression identified strong effects of both group and kind of surgery on NV: patients in the infusion group suffered a higher incidence of NV, as did laparoscopy patients. Infusion of alfentanil during laparoscopy combined synergistically to cause NV (**Table**). Type of surgery and method of alfentanil administration did not affect the need for anti-emetic. Four patients experienced prolonged PACU stay: all underwent laparoscopy; 3 received alfentanil by infusion. Laparoscopic surgery ($P<.0001$ *v.* incisional) and infusion of alfentanil ($P<.02$ *v.* bolus) prolonged PACU stay.

Table. Incidence of nausea with vomiting after alfentanil

GROUP:	BOLUS	INFUSION	TOTAL
Laparoscopy:	6 of 10	6 of 6¶	12 of 16* (75%)
Incisional:	0 of 10¶	4 of 14	4 of 24* (17%)
TOTAL:	6 of 20† (30%)	10 of 20†(50%)	16 of 40

*P<.0001 laparoscopy v. incisional; †P<.0001 bolus v. infusion
¶ P<.0001 synergistic effect of infusion with laparoscopy

DISCUSSION

These data confirm increased NV following laparoscopy.[2,3] Why is infusion, not bolus administration of alfentanil, associated with more post-operative NV? Perhaps intermittent administration permits sporadic egress of opioid from medullary sites responsible for NV. Although previous work showed no difference (bolus *v.* infusion) in anti-emetic requirement after alfentanil,[1] that study comprised only 10 patients per group, none undergoing laparoscopy, and utilized higher doses of alfentanil (≈150 μg/kg). Also, anti-emetic use does not always follow NV. Many patients are nauseated without vomiting or vomit once with relief of nausea. Is NV a problem of sufficient magnitude to prolong PACU stay? Since only 4 patients (25% of those nauseated) experienced a prolonged PACU stay, these data cannot answer that question, nor any possible benefit of anti-emetic prophylaxis. Alfentanil is associated with a high incidence of NV during laparoscopy in women, particularly when given by continuous infusion.

References: 1. Anesthesiology 68:851,1988; 2. Can Anaesth Soc J 31:178,1984; 3. Anaesthesia 41:537,1986.