AMBULATORY ANESTHESIA II

A13

TITLE: **DESFLURANE VERSUS PROPOFOL FOR OUTPATIENT ANESTHESIA**

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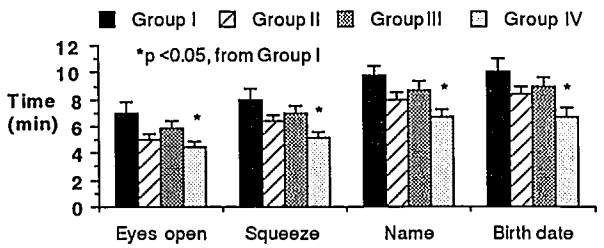
Desflurane is a new volatile anesthetic with a low blood : gas solubility which should produce a more rapid induction and recovery than existing agents. Desflurane anesthesia was compared to a standard propofol-nitrous oxide (N_2O) technique according to an IRB-approved protocol.

Ninety-two healthy, consenting, unpremedicated women having outpatient laparoscopies were randomized to one of four treatment groups: **Group I** (control) propofol induction (2.5 mg·kg^{-1}, i.v.) and maintenance (75-160 µg·kg^{-1}·min^{-1}) with N_2O, 60%, in oxygen, **Group II** propofol induction and maintenance with desflurane, 4-7%, in N_2O, 60%, **Group III** induction and maintenance with desflurane in N_2O, 60%, and **Group IV** induction and maintenance with desflurane in oxygen. Desflurane was delivered from a modified Ohmeda DM5000 anesthesia machine with an electrically heated vaporizer. For induction, the desflurane concentration was increased in 0.5% increments until loss of consciousness. Ventilation was controlled to maintain normocarbia. After surgery, recovery was assessed by determining the times of eye opening and response to verbal commands. Digit-symbol substitution tests (DSST), and visual analogue scales (VAS) for pain, sedation and nausea were obtained preoperatively and at 30, 60, 90 and 120 min. intervals after surgery. Data (mean ± S.D.) was analyzed using analysis of variance for continuous variables and Chi-square tests for descriptive variables, with p values <0.05 considered statistically significant (*).

The four groups were similar with respect to age, weight, race, ASA physical status and length of surgery. Over 40% of patients receiving propofol complained of pain on injection. Inhalation induction required 100 ± 35 sec in Group III vs 124 ± 43 sec in Group IV. Breathholding, apnea and coughing were more frequent during inhalational induction and were unaffected by N_2O. Compared to Group IV, the times for emergence from anesthesia were significantly longer in the propofol control group (figure). Times from arrival in recovery to sitting, standing, walking, taking oral fluids and to being "fit for discharge" were similar in all four groups, and there were no differences in DSST or VAS scores between groups during the recovery period. Patients in Group I had a lower incidence of postoperative nausea than those receiving desflurane (II-IV).

In conclusion, inhalation induction with desflurane was rapid, however, the agent appeared to possess significant airway irritant properties. Recovery from anesthesia with desflurane was also rapid; however, the decrease in emergence times compared to propofol were small and late recovery profiles appeared similar for all four groups. Desflurane is an acceptable alternative to propofol for maintenance of outpatient anesthesia, but its use was associated with a higher incidence of postoperative nausea.



A14

TITLE: **EFFECT OF INTRAOPERATIVE KETOROLAC ON RECOVERY AFTER OUTPATIENT LAPAROSCOPY**

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Pain and nausea remain the most common problems after outpatient laparoscopic procedures. While the use of propofol has decreased postoperative nausea and vomiting, discomfort on emergence from propofol anesthesia frequently requires treatment with potent opioid analgesics. We designed a randomized, double-blinded, placebo-controlled study to evaluate the effects of ketorolac (a non-steroidal anti-inflammatory analgesic) when administered during laparoscopic procedures.

76 healthy, consenting women undergoing laparoscopic procedures under general anesthesia were randomized to one of three treatment groups according to an IRB-approved protocol. All patients received a standard anesthetic consisting of fentanyl 2 µg/kg, propofol 2 mg/kg and 25-200 µg/kg/min with 67% nitrous oxide for maintenance. Prior to skin incision, patients were administered either saline (2 ml) or ketorolac, 30 or 60 mg, im. Postoperative pain and nausea were assessed at 30 min intervals using visual analog scales (0 = none to 100 = severe). Patients complaining of postoperative pain were treated with fentanyl 50-100 µg iv, and/or ketorolac 30-60 mg im. Statistical analysis included ANOVA (with Student's t-test) and the Chi square test, with $p < 0.05$ considered significant (means ± S.D).

There were no significant demographic differences between the three treatment groups (table). Times to awakening, extubation, oral intake, ambulation, and discharge were also similar in all three groups. However, only 27-31% of the patients receiving ketorolac complained of postoperative pain compared to 73% of the patients in the control (saline) group. In the early postoperative period, more patients required fentanyl in the saline (vs ketorolac) group. In addition, 42% of the saline group (vs only 4% in the ketorolac groups) received ketorolac in the PACU. Finally, 21% of the saline-treated patients (vs 4% in the ketorolac groups) required oral analgesics prior to discharge.

Intraoperative ketorolac decreased the requirement for both oral and parenteral analgesics after outpatient laparoscopy. Our failure to find a significant difference in the incidence of nausea/vomiting may have resulted from the fact that ketorolac was used as a "rescue" analgesic. In conclusion, ketorolac, 30-60 mg im, provides effective analgesia in the early postoperative period when administered during ambulatory surgery.

TABLE	Saline	Ketorolac	
	2 ml	30 mg	60 mg
Age (yr)	30±5	33±8	31±6
Weight (kg)	65±12	67±13	62±12
Anesthesia time (min)	57±19	56±37	54±42
propofol dose (mg)	540±245	499±227	342±175*
Postop. analgesics (no. of patients)			
fentanyl (iv)	13	6	3*
ketorolac (im)	10	1*	1*
oral drug (po)	5	1	1
Ave. pain score (mm)	28±15	32±13	22±13
Recovery times (min)			
awakening	6±3	7±3	7±3
extubation	6±3	8±4	8±3
sitting	76±33	79±22*	57±15*
oral intake	100±43	102±51	79±24
ambulation	141±51	139±49	127±47
discharge	190±62	168±66	158±55
Nausea/vomiting (%)	16	28	18

*Significantly different from saline, p<0.05.