## A19

Title: IS DESFLURANE SUPERIOR TO PROPOFOL FOR OUTPATIENT ANESTHESIA?

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Introduction: Desflurane, a new inhaled anesthetic with a low blood:gas solubility coefficient (0.42), is expected to produce rapid induction of anesthesia and rapid recovery. These properties should make this an ideal agent for outpatient anesthesia where rapid recovery of psychomotor and cognitive function is important. In addition, its physical properties may make it a useful agent for inhalation induction.

Methods: The institutional ethical review committee approved the study and all patients gave written informed consent. Sixty patients (age 18-65), ASA physical status 1 or 2, scheduled for outpatient orthopedic procedures were enrolled in this double-blind trial. The patients were randomly assigned to one of four treatment groups:

Group 1 - Propofol 2.5 mg/kg IV for induction with desflurane and 60% $N_2O$ in $O_2$ for maintenance.

Group 2 - Propofol 2.5 mg/kg IV for induction with propofol infusion and 60% $N_2O$ in $O_2$ for maintenance.

Group 3 - Desflurane and 60% $N_2O$ in $O_2$ for inhalation induction and maintenance.

Group 4 - Desflurane in $O_2$ for inhalation induction and maintenance.

Duration and quality of induction were evaluated as well as recovery characteristics and incidence of side effects. All data were analyzed with ANOVA or Chi Square with $p \leq 0.05$ considered significant.

Results: The data are summarized in Tables 1 - 2. There were no significant differences in demographic variables or duration of anesthesia. Additionally, there was significantly more breath holding in the patients receiving an inhalation induction compared to an IV induction.

Conclusions: The quality and speed of an inhalation induction with desflurane is inferior to that of an IV induction with propofol. The immediate recovery of patients in Group 4 was faster than the other three treatment groups. However, the intermediate recovery characteristics, including discharge time, of patients in Group 4 did not differ significantly from patients in Group 2. There was significantly more vomiting among patients in Group 3 than patients in Groups 2 or 4. Recovery time and quality following the desflurane - oxygen anesthetic did not differ from the propofol induction - propofol maintenance anesthetic. We conclude that desflurane for maintenance of anesthesia for short outpatient operations is an acceptable alternative to propofol.

Table 1
Induction and Immediate Recovery

| | Group 1 n = 16 | Group 2 n = 14 | Group 3 n = 14 | Group 4 n = 16 |
|---|---|---|---|---|
| Time LOC (sec) | 69 ± 48+ | 51 ± 25+ | 160 ± 76 | 222 ± 55 |
| Ind. Br. Hold (#) | 0/16 | 1/14 | 11/14§ | 13/16§ |
| Open Eyes (min) | 8 ± 2 | 10 ± 11 | 8 ± 2 | 4 ± 2* |
| Verb. Com. (min) | 9 ± 3 | 12 ± 15 | 8 ± 2 | 4 ± 2* |
| Alert (min) | 10 ± 3 | 9 ± 3 | 10 ± 1 | 6 ± 2* |

+p ≤0.05 ANOVA with Bonferoni Correction; Gp 4 compared to Gp 1 or 2, and Gp. 3 compared to Gp 1 or 2 (LOC = Loss of Consciousness)

§p ≤0.05 Chi Square; Gp. 3 or 4 compared to Gp 1 or 2 (Ind. Br. Hold = Induction Breath Holding)

*p ≤0.05 ANOVA with Bonferoni Correction; Gp 1, 2 or 3 compared to Gp 4

Table 2
Intermediate Recovery and Discharge

| | Group 1 | Group 2 | Group 3 | Group 4 |
|---|---|---|---|---|
| Ambulate (min) | 127 ± 42 | 94 ± 23* | 132 ± 46 | 94 ± 21* |
| PO intake (min) | 63 ± 21 | 66 ± 21 | 74 ± 34 | 64 ± 32 |
| Vomiting (#) | 4/16 | 0/14 | 7/14+ | 2/16 |
| Discharge (min) | 163 ± 73 | 110 ± 22* | 159 ± 60 | 120 ± 28* |

* p ≤0.05 ANOVA with Bonferoni Correction; Gp 2 or 4 compared to Gp 1 or 3

+p ≤0.05 Chi Square; Gp 3 compared to Gp 2 or 4

## A20

TITLE: PROPOFOL BOLUS VS INFUSION: COMPARISON WITH MIDAZOLAM FOR MONITORED SEDATION.

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We have previously reported preliminary data from a comparison of midazolam (MZ) vs propofol for monitored sedation, given either by bolus (PB) or infusion (PI)(1). This report constitutes intraoperative findings and mood alterations.

**METHOD:** Following IRB approval and informed consent, 90 patients (ASA I-III) undergoing vascular access under local anesthesia were randomly assigned to 3 groups.The groups were comparable in age, weight and sex distribution. Group MZ received midazolam 0.02 mg/kg iv. Group PB received propofol 0.75-1.0 mg/kg iv. Both MZ and PB received incremental doses of 1/4 the initial dose. Group PI received propofol 0.75-1.0 mg/kg iv followed by an infusion at 2-4 mg/kg/hr. BP, HR, RR, $O_2$SAT and sedation level (5 point scale) were monitored each minute for 5 mins and then at 5-minute intervals. (R) atrial blood sample was taken for blood pH and $PCO_2$ at maximum sedation. Time and dose required to reach Sedation Level 3 (SL3) were noted, and the BP, HR and $O_2$SAT at SL3 were compared between the 3 groups. Patients were asked to rate their mood on a visual analog scale at baseline, recovery room entry (RRE) and 120 mins post-sedation (PS). Changes over time within and between groups were compared by t-test ($P<.05$ for significance).

**RESULTS:** The major differences between treatments were in the time to reach SL3 and in $O_2$SAT change from baseline to SL3. SBP, DBP, MBP dropped in all 3 groups, but only SBP differed between groups, as shown in the table below (values are mean ± std. error).

| | MZ | PB | PI |
|---|---|---|---|
| Mins to SL3 | 6.97±1.2 | 1.84±0.2* | 4.10±1.0+ |
| DosetoSL3(mg/kg) | 0.04±.01 | 0.94±.04 | 1.20±0.1+ |
| $O_2$SAT change | -0.34±0.4 | -2.20±0.7* | -1.44±0.4 |
| SBP chg to SL3 | -5.86±1.9 | -9.53±2.0 | -12.24±2.4* |

*P<.05 vs. MZ

+P<.05 vs. PB

There were no differences between groups in : 1) lowest RR, 2) HR, 3) central venous pH and $PCO_2$, 4) $O_2$SAT except as above. Patients in all 3 groups reported elevated mood at RRE. This increase was significant for MZ and PI. All 3 groups continued to show elevated mood at PS.

**CONCLUSIONS:** PB achieves the fastest sedation, but it produces the maximum drop in $O_2$SAT. PI leads to quickest recovery(1), despite requiring a larger dose to achieve SL3. Mood changes were most marked with MZ and PI. Most variables were surprisingly stable. PI & PB seem to be equivalent in their effects and comparable to MZ.

(1) Anesthesiology 73:A197, 1990.

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