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Effects of Single Bolus Dose of Propofol and Methohexital in Eye Surgery Patients

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Introduction: Propofol is a rapidly acting intravenous anesthetic agent which produces transient loss and rapid return of consciousness due to large initial volume of distribution followed by rapid decrease in blood levels of the drug. The duration of the effect of the drug is dose related. We studied the effects of propofol compared with methohexital in patients undergoing retrobulbar and facial nerve blocks for eye surgery.

Materials and Methods: After IRB approval and informed consent, 38 patients undergoing cataract surgery were included in the study. They were all males with a mean age of 62 yrs. (46-85 years). The patients were randomly allocated to receive 1 mg/kg propofol (N=10), 0.7 mg/kg methohexital (N=9), 2 mg/kg propofol (N=10), and 1.5 mg/kg methohexital (N=9). No premedication was administered. Monitors included ECG, pulse oximeter, blood pressure and EEG. All patients received supplemental oxygen by nasal canula. Heart rate, blood pressure, response to pain, duration of apnea, duration of loss of consciousness and abnormal movements were recorded every minute until the patients regained consciousness and responded to verbal commands. Statistical analysis was done using paired t-test and two sample t-test. $p < 0.05$ was considered significant.

Results: Heart rate increased in all the groups (Table). Heart rate in 0.7 mg/kg methohexital group was not significantly higher than the 1 mg/kg propofol group. Methohexital 1.5 mg/kg produced significantly higher heart rate than propofol 2 mg/kg. One mg/kg propofol, 0.7 mg/kg methohexital and 1.5 mg/kg methohexital produced an insignificant rise in blood pressure. Propofol 2 mg/kg produced a significant ($p<0.05$) decrease in blood pressure compared to the resting blood pressure and 1.5 mg/kg methohexital. Apnea occurred in all the groups and there was no statistical difference between the groups. Methohexital 1.5mg/kg produced greater duration of apnea than propofol 2 mg/kg, but not significantly. Propofol produced significantly longer duration of anesthesia in both the groups as compared to methohexital groups ($p<0.05$). Abnormal movements occurred in all the groups in 10-20% of patients following administration of the drug.

Discussion: Propofol and methohexital are useful intravenous anesthetics for short anesthesia procedures eg injection of local anesthetics for regional blocks, dental extraction , etc. Propofol produced less increase in heart rate than methohexital. Propofol produced no significant change in systolic blood pressure in 1 mg/kg dose and a decrease in blood pressure with 2 mg/kg whereas methohexital produced a rise in blood pressure. The duration of anesthesia was longer with propofol in both doses as compared with methohexital as reported by others (1). Tremor, semipurposeful movements, clonic movements and yawning were observed in all groups of patients. The reports of faster recovery with propofol compared to methohexital could be due to use of adjuvant drugs or other anesthetic agent in previous studies. The patients were more alert and cooperative during surgery following propofol as compared to methohexital,. once they recovered from anesthesia.

We conclude that propofol is associated with less tachycardia than methohexital. Duration of apnea was less with propofol in 2 mg/kg dose than methohexital. Duration of anesthesia was longer with propofol than methohexital. Abnormal movements were present in all the groups. None of the patients were aware of the local anesthetic injection for the regional block.

Table: Cardiovascular, respiratory and anesthetic characters following intravenous bolus injection of propofol and methohexital.

	Propofol (1mg/kg)	Methohexital (0.7mg/kg)	Propofol (2mg/kg)	Methohexital (1.5mg/kg)
Change in heart rate in percent from resting level	↑11%	↑26%	↑15%	↑40%*
Percent change in systolic blood pressure	↑2.6%	↑5.5%	↓3.4%*	↑5.3%
Duration of apnea, Seconds mean ± SE	45±9	33±10	84±11	136±18
Response to pain seconds (after IV bolus) mean ± SE	54±6	80±13	143±2	103±20
Response to verbal commands, Seconds (after IV bolus) mean ± SE	256±38	184±13	420±37	318±39
Abnormal movements Percent of patients	10%	11%	20%	11%

*=$p<0.05$

References:
1. M.R. Logan, J.E. Duggan, I.D. Levack, AA Spence, Single-shot i.v. anaesthesia for outpatient dental surgery. Br J Anaesth 59:179-183, 1987

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ACCURACY OF PREDICTION OF PLASMA CONCENTRATIONS OF ALFENTANIL AND MIDAZOLAM IN CORONARY SURGERY.

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Introduction: Computer-assisted continuous infusion (CACI) is a very attractive anesthetic technique in cardiac anesthesia (1). The purpose of this study was to evaluate the accuracy of prediction of a combined CACI of alfentanil and midazolam in coronary surgery.

Material and methods: 12 male patients, aged less than 65 and within 25 % of ideal body weight were studied. Renal and hepatic functions were normal. Left ventricular ejection fraction was superior to 50 %. Alfentanil was given to attain varying plasma concentrations (endotracheal intubation: 500 ng/ml; sternotomy: 700 ng/ml) according to a population model (2). Midazolam was given to maintain a stable theoretical plasma concentration of 100 ng/ml before CPB, according to a selected conventional pharmacokinetic model, previously studied in healthy female patients receiving a midazolam CACI (3). Predicted midazolam plasma concentrations were also calculated for the same regimen, using another model studied in male adult volunteers after a small bolus (4). For each patient, samples were taken at intubation, skin incision, sternotomy and cannulation. Dosages of midazolam and alfentanil were performed with HPLC. To evaluate the accuracy of prediction, the prediction error of each blood sample, the mean bias and the standard deviation (STD) of each patient and model were calculated. The mean bias ± STD were considered significant when the mean ± 2 STD (95% confidence limit) did not include 0.

Results: The mean bias of the alfentanil population model was significant: 31.8% ± 15.6 (2). For midazolam, the mean bias of the selected model was significant: 41.6 % ± 10.1 (3) but the mean bias of the other model was low: 5.8 % ± 17.2 (4).

Conclusion: During CACI in coronary patients, a population pharmacokinetic model (2) does not predict alfentanil plasma concentrations accurately, as it has already been evidenced in other clinical settings (5). On the contrary, for midazolam, a conventional pharmacokinetic model (4) gives an accurate prediction to generate a low and stable plasma concentration.

References: 1 Anesthesiolgy 63:41 1985
2 Anesthesiology 66:3 1987
3 Br J Anaesthesia 59:548 1987
4 Br J clin Pharmac 16:43S 1983
5 Anesthesiology 73:66 1990