Title: INTRAOCULAR PRESSURE DURING INDUCTION OF ANESTHESIA WITH PROPOFOL OR THIOPENTAL FOLLOWED BY VECURONIUM: INFLUENCE OF AN ADDITIONAL DOSE OF THE INDUCTION AGENT

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Propofol (2,6, di-isopropylphenol) is a new intravenous anesthetic agent which is associated with a rapid and smooth induction of anesthesia and a rapid and smooth recovery[1,2]. A good control of intraocular pressure(IOP) is essential for success of ophthalmic surgery and propofol has been shown to reduce IOP significantly[3]. It has also been shown that a second smaller dose of propofol given just before intubation was able to attenuate the rise in IOP following intubation facilitated with succinylcholine[4]. It is likely that rises in IOP would be much less if a nondepolarising relaxant rather than suxamethonium is used for tracheal intubation. In the present study IOP changes have been compared following induction of anesthesia with propofol and thiopental followed by vecuronium for facilitating tracheal intubation. The effect of a second smaller dose of the induction agents given immediately prior to intubation has also been investigated.

METHODS: Eighty ASA I or II adult patients requiring general anesthesia for elective ophthalmic surgery were included in the study after obtaining their informed consent and approval from the ethical committee. Patients with pre-existing raised IOP were excluded. Following premedication with diazepam 60-90min preoperatively anesthesia was induced in 40 patients each with a sleep dose of propofol(P) or thiopental(T) preceded by fentanyl 100ug. The induction agent was followed by vecuronium 0.1 mg/kg and patients ventilated with 66% nitrous oxide in oxygen. Tracheal intubation was carried out three minutes after vecuronium administration. Half the patients in each group received an additional smaller dose of the same induction agent i.e. propofol 1.0 mg/kg(P+Supp) or thiopental 2.0 mg/kg(T+Supp) one minute prior to intubation. The allocation of patients to the four groups was randomised. Control measurements of IOP were made after premedication using topical anesthesia. Further measurements were made after the induction agent, prior to intubation, immediately after intubation and 1 and 2 minutes later. Heart rate(HR) and systolic arterial pressure(BP) were recorded at the same time. Note was made of any side effects at induction. The results were subjected to analysis of variance and t tests.

RESULTS: The patient groups were comparable in age, weight and control IOPs. Majority of the patients received the induction agents in a vein on the dorsum of the hand. The average induction dose of propofol was 2.15 mg/kg and of thiopental 4.8 mg/kg excluding the supplementary doses in the two groups. The IOP changes alongwith the peak changes in HR and BP are shown in Table 1. It is clear that in the single dose groups the IOPs were significantly lower in those given propofol at all times except soon after induction. The differences between the groups receiving supplements were significant only at 1 and 2 minutes after intubation although IOPs were lower throughout in the propofol group. Administration of the supplementary dose of either propofol or thiopental prior to intubation was associated with significantly lower IOPs soon after intubation in comparison to those not receiving the additional dose. HR and BP were both significantly lower soon after intubation in those given propofol but giving the additional dose made no difference for each of the two induction agents. Discomfort on injection was experienced by 12 patients given propofol and by 1 given thiopental. Fewer patients had nausea or vomiting after propofol but the overall incidence was too low for any meaningful analysis.

Table 1. IOP, HR and BP changes during induction.

	P	P+ Supp	T	T+ Supp
Mean IOP(mm Hg)				
Control	14.6	15.1	13.5	14.3
After induction	8.1	9.4	8.6	9.1
Pre-intubation*	5.3	5.9	6.9	6.2
Post-intubation*+	11.5	9.7	12.8	10.3
Intubation+1mi*$	8.4	7.8	10.8	9.6
Intubation+2min*$	7.5	6.6	9.6	8.6
HR after intubation*				
(% of control)	101	107	121	110
BP after intubation*				
(% of control)	86	85	101	91

*p<0.03-0.002 between P and T; +p<0.05 between P and P+Supp and between T and T+Supp; $p<0.01 between P+Supp and T+Supp.

DISCUSSION: The present study confirms the results of earlier studies demonstrating reduction in IOP with the use of propofol. The rise in IOP as a result of intubation is attenuated to a much better extent by the additional dose of propofol with the result that this group showed very little change in IOP as a result of intubation. This appears to be a useful technique of induction of anesthesia where a rise in IOP is undesirable.

REFERENCES:

1 Cummings GC, Dixon J, Kay NH, et al: Dose requirements of ICI 35,868 (Propofol,'Diprivan') in a new formulation for induction of anaesthesia. Anaesthesia 39: 1168-1171, 1984.

2 Doze VA, Westphal LM, White PF: Comparison of propofol with methohexital for outpatient anesthesia. Anesth Analg 65: 1189-1195, 1986.

3 Mirakhur RK, Shepherd WFI: Intraocular pressure changes with propofol("Diprivan"):Comparison with thiopentone. Postgrad Med J 61(Suppl 3):41-44,1985.

4 Mirakhur RK, Shepherd WFI, Darrah WC: Propofol or thiopentone:effects on intraocular pressure associated with induction of anaesthesia and tracheal intubation (facilitated with suxamethonium). Br J Anaesth 59: 431-436, 1987.

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