Title: CHANGES IN INTRAOCULAR PRESSURE DURING RAPID SEQUENCE INDUCTION OF ANESTHESIA USING PROPOFOL OR THIOPENTAL WITH VECURONIUM

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Induction of anesthesia with propofol (2,6-diisopropylphenol), a new nonbarbiturate anesthetic agent, is smooth and without any major adverse effects[1,2] and in addition, is associated with a significant lowering of intraocular pressure(IOP)[3]. A rise in IOP is of major concern when inducing anesthesia and performing tracheal intubation in patients with perforating eye injuries. Many of these patients may in addition have the problem of a full stomach. The use of succinylcholine, which is the relaxant of choice for intubation in patients with a full stomach, is controversial in patients with perforated eye injuries and most would consider its use to be contraindicated in this situation. In the present study we have investigated the effects of propofol and thiopental on IOP when used in a rapid sequence induction to induce anesthesia in combination with vecuronium.

METHODS: Forty adult ASA I or II patients scheduled to undergo elective ophthalmic surgery were studied after obtaining their informed consent and ethical committee approval. Patients with raised IOP were excluded. An i.v. infusion was commenced upon arrival in the operating room and patients given fentanyl 2 ug/kg during a 5 minute period of preoxygenation with a face mask held gently by the patient himself. Vecuronium in a dose of 0.15 mg/kg was then administered followed by rapid administration of a sleep dose of propofol or thiopental as soon as the earliest signs of muscle weakness such as heaviness of the eyelids or loosening of the grip on the face mask appeared. Cricoid pressure was applied and intubation and cuff inflation carried out 30s later. Ventilation was then started with nitrous oxide in oxygen supplemented with isoflurane. All IOP measurements were carried out by the same person using a hand held applanation tonometer. Baseline IOP was measured after premedication following topical anesthesia with 1% amethocaine and further measurements made after the administration of the induction agent, immediately after intubation and cuff inflation and 1, 2 and 3 minutes later. Heart rate(HR) and systolic blood pressure(BP) were recorded at the same time as IOP. Onset and duration of clinical relaxation with the first dose of vecuronium were recorded as were the intubating conditions and occurrence of any side effects. Patients were questioned about acceptability of induction 24 hours later. Statistical significance of the results was tested by analysis of variance and t tests with $P<0.05$ considered to be significant.

RESULTS: The 20 patients in each of the two groups were comparable with regard to their age and weight. The average induction doses of propofol and thiopental were 2.5 and 5.4 mg/kg respectively and the average time between relaxant and induction agent administration was 35s. IOP, HR and BP changes are given in table 1. It is clear that the control of IOP was much superior with the use of propofol. The IOP with its use was significantly lower than with the use of thiopental at all times of measurement except soon after induction. Whereas IOP increased significantly following intubation in the group receiving thiopental, the rise in those given propofol was minimal and insignificant. HR rise following intubation was significantly more after thiopental than after propofol as was the BP. However peak decrease in BP was significantly more in the group given propofol. There was no difference in the average duration of clinical relaxation of vecuronium in the two groups. Although intubating conditions were satisfactory in all patients, these were excellent more often in the propofol group. The induction sequence was found to be acceptable by all patients.

Table 1: IOP, HR and BP changes during induction

	Propofol	Thiopental
IOP(mm Hg)		
Baseline	14.4	14.1
Post-induction	9.1	9.8
Post-intubation*	9.9	13.0
Intubation+1min*	6.6	10.8
Intubation+2min*	5.9	9.3
Intubation+3min*	5.7	7.8
Post-intubation		
HR change(%)*	+ 7.2	+36.9
BP change(%)*	- 7.4	+ 7.7
Peak fall in BP(%)*	25.4	7.1

*Difference significant between groups($P<0.02$-0.005)

DISCUSSION: The present study has shown that the control of IOP is much superior with the use of propofol in comparison to thiopental in the face of a potent stimulus such as tracheal intubation. This may be due to either a much smoother induction with it or due to a greater hypotension which it produces[4]. Hypotension is a possible disadvantage but is short lasting and responds to i.v. fluids.

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