COMBINATION OF FENTANYL, ETOMIDATE AND VEUCRONIUM MAY CAUSE SEVERE VAGOTONIC STATE

Sir,—Recent clinical reports have suggested that there may be a possible contribution of vecuronium to bradycardia during general anaesthesia (May, 1985; Milligan and Beers, 1985; Clayton, 1986; Pollok, 1986).

According to these reports, this kind of arrhythmia occurs in combination with the administration of vecuronium, mainly at the time of severe vagal stimulation such as manipulation of the upper respiratory tract. It does not usually occur immediately after the induction of anaesthesia. Exceptions are the cases reported by Starr, Sethna and Estafanous (1986) in which the injection of vecuronium was combined with the rapid administration of large doses of sufentanil and caused asystole before intubation of the trachea. This is particularly noteworthy when both agents are used, nor has it happened when pancuronium and vecuronium was substituted for vecuronium.

According to our experience, asystole or severe bradycardia can occur even with light vagal stimulation and without large doses of opoid when vecuronium is administered together with etomidate and a small dose of fentanyl. Out of 849 cases in which anaesthesia was induced with vecuronium (0.003–0.004 mg kg⁻¹), etomidate (0.3–0.4 mg kg⁻¹) and vecuronium (0.1–0.12 mg kg⁻¹), we saw two cases of extreme bradycardia (less than 40 beat min⁻¹) before intubation, one while spraying lignocaine onto the patient's tongue and another during mask ventilation with oxygen. On occasions we saw extreme bradycardia or asystole during intubation (five patients), or during manipulation (one patient case) such as the insertion of fingers to the pharynx to aid the passage of a nasogastric tube, or through irritation of a nostril with a nasogastric tube (one patient).

These arrhythmias were relatively harmless, however, because in all of the above cases, the heart rate returned relatively quickly to greater than 40 beat min⁻¹ when the manipulation was stopped and precordial thumps were given. In some instances atropine was injected. Our patients (mostly cardiac patients) are usually premedicated with diazepam 10 mg by mouth and morphine sulphate 0.15 mg kg⁻¹ 1 h before the induction of anaesthesia. No atropine is given.

We could not find any definite correlation between specific cardiac diseases or preoperative medication and the occurrence of severe bradycardia or asystole. Arrhythmias occurred in patients with coronary artery disease as well as aortic or mitral valve disease. Some, but not all, patients were receiving ß-blocking agents, digoxin or calcium antagonist before operation. It is particularly noteworthy that this kind of arrhythmia may occur when thiopentone 3–4 mg kg⁻¹ or methohexitone 1–2 mg kg⁻¹ was used, nor has it happened when pancuronium was substituted for vecuronium.

The possible mechanism for the haemodynamic differences between etomidate and barbiturate or between vecuronium and pancuronium is to be sought in their effects on vagal tone. In animal experiments, barbiturates have been shown to inhibit vagal activity, whereas etomidate was seen to have minimal effects or occasionally increased vagal activity (Inoue and Arndt, 1982). Pancuronium, but not vecuronium, has a vagolytic effect (Durant et al., 1979). Furthermore, it is tempting to speculate that vecuronium may contribute positively to the vagotonic response because vecuronium was shown to decrease heart rate in fentanyl anaesthesia (Salmenperä et al., 1983). Thus, when thiopentone, methohexitone or pancuronium is used, the vagomimetic effects of fentanyl are countered, but if this is not the case and the vagomimetic effects of fentanyl are enhanced by another agent, severe vagotonic reactions may result.

Vecuronium, which does not have autonomic or vagolytic effects, may be used to advantage, but its non-vagolytic effects may prove to be disadvantageous, as was shown in the patients of Starr, Sethna and Estafanous (1986) and in our patients. When one chooses to administer vecuronium to facilitate intubation one should take the combined use of vagolytic agents into consideration.

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REFERENCES


A NEW DESIGN OF INTUBATING FORCES

Sir,—Nasotracheal intubation is often selected in paediatric patients—particularly infants requiring ventilatory support—in a wide variety of "medical" conditions and commonly in relation to major surgery.

Some paediatric units do not usually use the nasal route because of supposed technical difficulties. Supporters of the nasal route feel that the tracheal tube is more stable and secure.