

COMPARISON OF ORTHODOX WITH FIBREOPTIC OROTRACHEAL INTUBATION UNDER TOTAL I.V. ANAESTHESIA

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SUMMARY

Fibreoptic orotracheal intubation was compared with orthodox laryngoscopy and tracheal intubation using a total i.v. technique with propofol in 60 ASA I and II patients. There was no significant difference between the two techniques in haemodynamic profile (before, during and following the intubation procedure) and incidence of postoperative sore throat. Minimal oxygen saturation was 96% during the study; maximal end-tidal PCO₂ after intubation was 5.4 kPa. Intubation time was faster (P < 0.01) in the orthodox group (30.7 (SEM 2.3) s) than in the fibreoptic group (52.7 (4.8) s).

KEY WORDS

Anaesthetics, intravenous: propofol. Intubation, tracheal: fibreoptic.

Flexible fibreoptic instrumentation is a useful method of establishing a safe airway. It may become the method of choice for many anaesthetists rather than reserved for patients in whom rigid techniques have proven to be unsuccessful.

The haemodynamic stress response to oral fibreoptic intubation has been compared with that to conventional intubation in subjects anaesthetized with volatile agents. There was a significant difference in the haemodynamic responses of patients anaesthetized with halothane during orthodox compared with fibreoptic intubation; in contrast, there was no difference during enflurane anaesthesia [1, 2]. The objectives of the present study were to examine the cardiovascular responses to oral fibreoptic and orthodox intubation during total i.v. anaesthesia with propofol and to assess the incidence of postoperative sore throat.

METHODS AND RESULTS

After approval by the local Ethics Committee and informed consent, we studied 60 patients (ASA I and II) undergoing elective ENT surgery. Patients taking antihypertensive medication and those with reflux, morbid obesity and airway pathology were excluded. The 60 patients were allocated to two groups. The first 30 underwent tracheal intubation orally with a Macintosh laryngoscope, while the other 30 underwent fibreoptic orotracheal intubation with an Olympus F6 bronchoscope. All patients were premedicated the night before with ranitidine 300 mg and 2 h before operation with midazolam 7.5 mg and atropine 1 mg orally. After arrival of the patient in the operating theatre, routine monitoring was commenced and an appropriate vein was cannulated.

Anaesthesia was induced as follows: fentanyl 0.2 mg i.v. was given to patients younger than 50 yr and fentanyl 0.1 mg i.v. to those of 50 yr and older; lignocaine 20 mg for local i.v. anaesthesia was administered with simultaneous infusion of propofol at a rate of 10 mg kg⁻¹ h⁻¹ and a propofol bolus of 1 mg kg⁻¹. As soon as adequate manual ventilation of the lungs was established, atracurium 0.5 mg kg⁻¹ was given i.v. Conventional or fibreoptic intubation was performed when neuromuscular block was complete (no visible reaction to train-of-four stimulation). All intubations were carried out by the authors.

Fibreoptic intubation was accomplished with the patient supine and the operator standing behind the patient's head. The bronchoscope,

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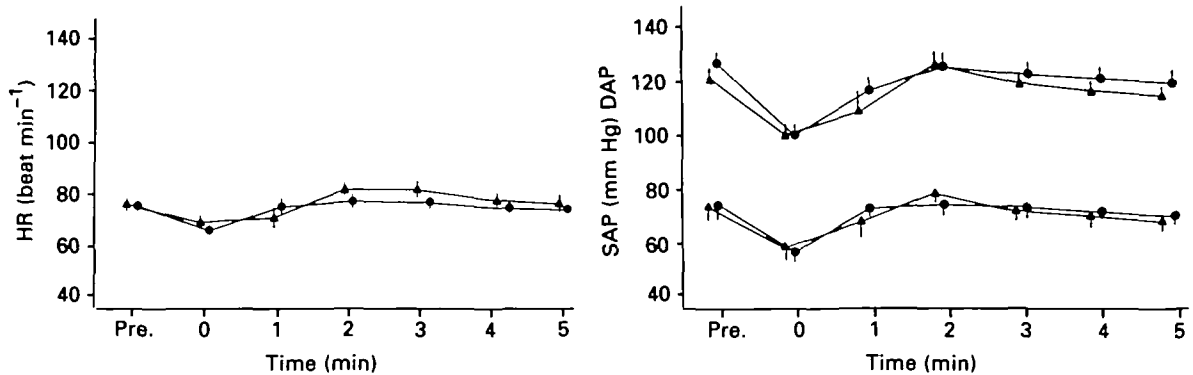


FIG. 1. Heart rate (HR) and systolic (SAP) and diastolic (DAP) arterial pressures (mean, SEM). Pre. = Last reading before induction; 0 = start of intubating procedure. ● = Intubated with laryngoscope; ▲ = intubated with fiberoptic bronchoscope.

with the tracheal tube mounted on it, was passed through the mouth and into the trachea with the jaw pulled forward by an assistant to open up the retropharyngeal space. The tip of the bronchoscope was positioned above the carina, the tracheal tube was slowly and carefully advanced into the trachea and the bronchoscope removed as soon as the position of the tube was confirmed visually to be about 2 cm above the carina.

The time between introduction of the laryngoscope or fibrescope until the first measurement of end-tidal carbon dioxide was recorded. Oxygen saturation was measured continuously.

Heart rate and systolic and diastolic arterial pressures were measured using a non-invasive pressure monitor (Mark III BP-103N) before induction of anaesthesia (control) and at 0, 1, 2, 3, 4 and 5 min after start of the intubation procedure. All patients were questioned after surgery for sore throat.

Data were analysed by chi-square, Student's *t* or Dutton's multiple comparison tests as appropriate. $P < 0.05$ was considered significant.

There were no significant differences in patient characteristics, in the haemodynamic profile during intubation (fig. 1) or incidence of post-operative sore throat. The time taken for fiberoptic intubation was significantly longer in the fiberoptic (52.7 (SEM 4.8) s) than in the conventional group (30.7 (2.3) s). Minimal oxygen saturation during the study period was 96% in the fiberoptic and 97% in the conventional group; maximal end-tidal P_{CO_2} after intubation was 5.2 and 5.4 kPa, respectively. Fifteen patients in the

laryngoscopic and 16 patients in the fiberoptic group admitted to sore throat on questioning after operation.

COMMENT

The magnitude of the stress response in this study was similar for conventional and fiberoptic intubation, confirming the findings of Finfer and colleagues [2]. A stable depth of anaesthesia for prolonged intubation is difficult to achieve with volatile agents without a ventilating mask, whereas continuous i.v. administration of a hypnotic agent is a simple method of guaranteeing a stable plasma concentration in spite of prolonged and sometimes recurrent periods of apnoea. We used propofol because of its pharmacological profile [3, 4]. There was no difference in mean arterial pressure after intubation compared with control values and heart rate increases of less than 10 beat min⁻¹ indicate that this anaesthetic technique may be useful to achieve haemodynamic stability. It should be stressed that our data were obtained from ASA I and II patients and we caution against extrapolation of our findings to patients with significant coronary artery and vascular disease. The observation that our technique of intubation had no influence on either cardiovascular responses or the incidence of post-operative sore throat suggests that total i.v. anaesthesia with propofol may be useful for teaching orthodox and fiberoptic intubation skills.

Advancement of the tracheal tube over the fibrescope cannot be controlled visually and injury to sensitive pharyngeal and laryngeal structures

may occur. However, there was no difference in the incidence of postoperative sore throat in the two groups. This may have been a result of our emphasis on careful technique rather than speed.

It may be of some potential concern that the airway remained unprotected for significantly longer during fiberoptic than conventional intubation. Silent regurgitation occurs in 4–26% of patients under general anaesthesia [5], but the clinical significance of this problem is not clear. The patients in this study were at low risk of regurgitation (elective surgery, fasted overnight, competent oesophageal sphincter).

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