The Effects of Translaryngeal Block and Innovar on Glottic Competence

DONALD W. CLAEYS, LT MC USNR, CHARLES H. LOCKHART, LCDR MC USNR, JAMES E. HINKLE, LCDR MC USNR

The places of translaryngeal topical anesthesia and sedation in the anesthetic management of the patient with a full stomach remain controversial. We have evaluated the effects on protective laryngeal reflexes of two commonly used adjuncts, translaryngeal block and small doses of Innovar administered intravenously.

METHOD AND MATERIALS

A 9-liter Collins spirometer was modified by attaching a single connecting hose from the inspiratory port and sealing the expiratory port. To the other end of the tubing, a nonrebreathing Sierra valve was attached through its inspiratory port. At the junction of valve and tubing, a 16-gauge plastic catheter was inserted. To the other end of the catheter a three-way stopcock and 50-ml glass syringe were attached, through which incremental doses of 2 per cent ammonia gas could be added. Laryngeal closure was indicated by an inspiratory hesitation on the kymographic record.

Two groups of ten human volunteers each, all physical status I or II, were selected. All subjects were unpremedicated. Once the control reading had been obtained for a subject, he was given either a translaryngeal block using 2 ml of 4 per cent lidocaine injected into the trachea percutaneously through the cricothyroid membrane or 2 ml of Innovar, iv. After a 5-minute delay, the subject was asked to repeat the test.

RESULTS

Figure 1 shows the responses of ten subjects to a dose of ammonia necessary to initiate glottic closure before and after translaryngeal block.

The results were significantly different by the chi-square test.

Administration of 2 ml of Innovar intravenously had no effect on glottic competence (fig. 2).

DISCUSSION

Because translaryngeal topical anesthesia and sedation may enhance patient acceptance of awake intubation of the trachea, these techniques have been advocated by anesthesiologists for management of the patient with a full stomach. The problem is whether topical anesthesia or sedation sufficient to allow endotracheal tube placement might also allow aspiration of regurgitated stomach contents. Waltz ¹ has shown that a dye-indicator-local anesthetic mixture stains supraglottic structures in more than three fourths of transtracheal and translaryngeal blocks. Although he states that “the spread of the solution should not be equated necessarily with the presence of topical anesthesia,” from other observations he concludes that usually closure of protective glottic sphincters is impaired by translaryngeal block. Therefore, this should not be performed in the patient with a full stomach.² The latter observation, however, was made after a study of patients who had received depressant drugs as well as translaryngeal block.

It was our goal to re-evaluate the problem using another method.

A technique to measure the loss of protective airway reflexes was described in 1960 by Pontoppidan and Beecher.³ This involved breathing dilute ammonia gas to stimulate a cough. The technique was recently modified and re-evaluated in a study by Hinkle and Tantum,⁴ measuring the depressive effects of topically applied lidocaine on glottic competence. They showed that glottic closure could be initiated by inhaling dilute concentrations of ammonia gas.
Our study incorporates their technique in evaluating the effect of either translaryngeal block or intravenously-administered Innovar on reflex closure of the glottic sphincter.

Translaryngeal block markedly altered the normal response to ammonia, suggesting that an unprotected glottis may result when translaryngeal block is used as an adjunct to awake intubation.

A small dose of Innovar leaves the airway reflexes intact, but it must be noted that individual dose responses may vary and that all subjects in this study were healthy. Whether data would be similar with debilitated patients or with larger doses is unknown. We conclude that Innovar is a safe adjunct to awake intubation of a healthy patient.

REFERENCES