Letters

To the Editor...

The choice: Intratracheal or IV lidocaine for intubation

Intratracheal application of lidocaine is commonly performed prior to endotracheal intubation. Studies have shown that dosages of 120 mg/70 kg attenuate the sympathetic responses of increased heart rate, blood pressure, and intracranial pressure resulting from intubation under light anesthesia.1,2

Patients who present with moderate to severe cardiovascular disease, a history of myocardial infarction or ischemia, or increased intracranial pressure may not tolerate profound sympathetic responses without problems.3,4

In 1956, Adriani reported that medication placed within the tracheobronchial tree had almost as rapid an uptake as medication injected intravenously.5 This study, in part, has led some anesthetists to follow the practice of spraying the larynx and trachea with the LTA® prefilled syringe containing 4 ml of 4% lidocaine, followed immediately by intubation. More recent work has shown that lidocaine applied in this manner takes at least four minutes to attain peak systemic absorption.6,7

Complete topical anesthesia of the larynx and trachea cannot be assumed following the use of the LTA Kit®. Local anesthetics are absorbed at different rates from within the respiratory tree. The presence of mucus, depth of respiration, and droplet size of the local anesthetic all account for non-uniformity in spread and uptake of the drug.8

Data reviewed suggest that at least one minute time interval should elapse before intubation following laryngoscopy and the use of intratracheal lidocaine if the effects of the drug are desired. This means spraying the cords, ventilating the patient by mask, and repeating laryngoscopy for intubation.

A viable alternative or adjunct to this technique is the intravenous injection of lidocaine, 1.5 mg/kg, approximately one to one and a half minutes prior to anticipated laryngoscopy and intubation. Maximum blood levels will thereby be present upon the initial attempt to intubate.9

With this practice then, approximately 100 mg of intravenous lidocaine is given to the 70 kg patient just after the “precurarization.” A further added benefit is significant protection against cardiac arrhythmias resulting from laryngoscopy and intubation.10

Lidocaine has a demonstrated value in reducing the systemic response to endotracheal intubation. If the anesthetist's goal is to effectively minimize sympathetic responses of increased heart rate, blood pressure, and intracranial pressure, a combination of appropriately used intratracheal and intravenous lidocaine is advised.

RICHARD LEBELL, CRNA, CPT, NC
Staff Nurse Anesthetist
U.S. Air Force Hospital
Pease Air Force Base, New Hampshire

REFERENCES

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May be used in asthmatic patients and patients with hepatic or renal insufficiency, but caution should be exercised in these cases.

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BRIEF SUMMARY—(Please consult full package insert, enclosed in every package, before using Regonol)

INDICATIONS—Pyridostigmine bromide is useful as a reversal agent or antagonist to nondepolarizing muscle relaxants.

CONTRAINDICATIONS—Known hypersensitivity to anticholinesterase agents, intestinal and urinary obstructions of mechanical type.

WARNINGS—Pyridostigmine bromide should be used with particular caution in patients with bronchial asthma or cardiac dysrhythmias. Transient bradycardia may occur and be relieved by atropine sulfate. Atropine should also be used with caution in patients with cardiac dysrhythmias. When large doses of pyridostigmine bromide are administered, as during reversal of muscle relaxants, prior or simultaneous injection of atropine sulfate is advisable. Because of the possibility of hypersensitivity in an occasional patient, atropine and antishock medication should always be readily available.

When used as an antagonist to nondepolarizing muscle relaxants, adequate recovery of voluntary respiration and neuromuscular transmission must be obtained prior to discontinuation of respiratory assistance and there should be continuous patient observation. Satisfactory recovery may be defined by a combination of clinical judgement, respiratory measurements and observation of the effects of peripheral nerve stimulation. If there is any doubt concerning the adequacy of recovery from the effects of the nondepolarizing muscle relaxant, artificial ventilation should be continued until all doubt has been removed.

Use in Pregnancy—The safety of pyridostigmine bromide during pregnancy or lactation in humans has not been established. Therefore its use in women who are pregnant requires weighing the drug's potential benefits against its possible hazards to mother and child.

ADVERSE REACTIONS—The side effects of pyridostigmine bromide are most commonly related to overdosage and generally are of two varieties, muscarinic and nicotinic. Among those in the former group are nausea, vomiting, diarrhea, abdominal cramps, increased peristalsis, increased salivation, increased bronchial secretions, miosis and diaphoresis. Nicotinic side effects can usually be counteracted by atropine. As with any compound containing the bromide radical, a skin rash may be seen in an occasional patient. Such reactions usually subside promptly upon discontinuation of the medication. Thrombophlebitis has been reported subsequent to intravenous administration.

DOSAGE AND ADMINISTRATION—When pyridostigmine bromide is given intravenously to reverse the action of muscle relaxant drugs, it is recommended that atropine sulfate (0.6 to 1.2 mg) or glycopyrrolate in equipotent doses be given intravenously immediately prior to or simultaneously with its administration. Side effects, notably excessive secretions and bradycardia are thereby minimized. Reversal dosages range from 0.1 to 2.5 mg/kg. Usually 10 to 20 mg of pyridostigmine bromide will be sufficient for antagonism of the effects of the nondepolarizing muscle relaxants. Although full recovery may occur within 15 minutes in most patients, others may require a half hour or more. Satisfactory reversal can be evident by adequate voluntary respiration, respiratory measurements and use of a peripheral nerve stimulator device. It is recommended that the patient be well ventilated and a patent airway maintained until complete recovery of normal respiration is assured. Once satisfactory reversal has been attained, reanastomosis has not been reported.

Failure of pyridostigmine bromide to provide prompt (within 30 minutes) reversal may occur, e.g., in the presence of extreme debilitation, carcinomatosis, or with concomitant use of certain broad spectrum antibiotics or anesthetic agents, notably ether. Under these circumstances ventilation must be supported by artificial means until the patient has resumed control of his respiration.

HOW SUPPLIED—Regonol is available in:

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- prompt recovery allows early neurological assessment

in patients undergoing pheochromocytoma excision
- permits rapid adjustment of depth and blood pressure to counter catecholamine-induced hypertension
- does not predispose to catecholamine-induced arrhythmias
- inherent muscle relaxant effect reduces need for histamine-releasing relaxing agents

for patients with kidney disease
- minimal risk of renal toxicity (virtually no biodegradation to inorganic fluoride; low solubility; rapid elimination via the lungs)
- no evidence of impaired renal function postoperatively (no increase in BUN levels; normal creatinine clearance; normal concentrating capacity)

for patients with liver disease
- exceptionally low biodegradation and rapid elimination via the lungs, for little disturbance of liver function
- in clinical pharmacology studies, no evidence of liver injury even after prolonged administration

in the myasthenic patient
- adequate surgical relaxant effect without muscle relaxants, to minimize problems with residual postoperative weakness
- rapid awakening, early return of airway control, complete elimination primarily via the lungs

The film, "Anesthesia for the Uncommon Surgical Challenge," in which many of these specialized anesthetic cases are discussed, is available for showing from your Ohio Medical Anesthetics representative.

For complete use information, please see following page.
References

Forane® (isoflurane) . . . a product of original Ohio Medical Research

CAUTION: Federal Law Prohibits Dispensing Without Prescription

DESCRIPTION

FORANE® (isoflurane) is a colorless, nonflammable general anesthetic agent. It is relatively insoluble in water and its physical properties are as follows:

- Molecular weight: 181.2
- Boiling point: -69°C
- Specific gravity: 1.45
- Vapor pressure at 31°C: 147 mm Hg
- Vapor pressure at 38°C: 400 mm Hg

A mixture of isoflurane in a 4:1 ratio with nitrous oxide may be used for maintenance of anesthesia. Isoflurane is a powerful respiratory depressant. PATIENTS MUST BE MONITORED CLOSELY AND SUPPORTED WHEN NECESSARY. Isoflurane increases end-expiratory tension and respiratory rate in normal subjects. The dose of isoflurane during maintenance of anesthesia should be reduced as the depth of anesthesia is increased. Isoflurane is rapidly metabolized by the liver. The major route of metabolism is by oxidative metabolism, which results in the production of a metabolite that is 50 to 150 times more potent than isoflurane. Isoflurane is excreted via the urine and feces. The plasma half-life of isoflurane is approximately 2 to 3 hours. Isoflurane is compatible with all standard anesthesia vaporizers and can be mixed with nitrous oxide in any proportion.

INDICATIONS AND USAGE

FORANE® (isoflurane) may be used for induction and maintenance of general anesthesia. Adequate data have not been developed to establish its application in obstetrical anesthesia.

CONTRAINDICATIONS

Known allergy to FORANE (isoflurane) or to other halogenated agents

WARNINGS

Since levels of isoflurane may exceed those of nitrogen oxide and oxygen, only experienced personnel should be responsible for the administration of isoflurane. Isoflurane is not recommended for use in patients with severe cardio-respiratory impairment, or in patients with severe or unstable cardiovascular disease. Isoflurane should be used with caution in patients with severe hypertension or in patients with a history of cardiac or respiratory disease. Isoflurane should not be used in patients with a history of alcoholism or drug addiction. Isoflurane should be used with caution in patients with a history of convulsive disorders. Isoflurane should not be used in patients with a history of respiratory disease. Isoflurane should be used with caution in patients with a history of asthma or chronic obstructive pulmonary disease. Isoflurane should not be used in patients with a history of gastrointestinal disease. Isoflurane should be used with caution in patients with a history of hepatic disease. Isoflurane should not be used in patients with a history of renal disease. Isoflurane should be used with caution in patients with a history of psychiatric disease. Isoflurane should not be used in patients with a history of allergy or anaphylaxis. Isoflurane should be used with caution in patients with a history of blood clotting disorders. Isoflurane should not be used in patients with a history of bleeding disorders. Isoflurane should be used with caution in patients with a history of drug abuse. Isoflurane should not be used in patients with a history of drug addiction.

PREGNANCY

There is no evidence that FORANE (isoflurane) is teratogenic in man or in animals. Isoflurane has been used in clinical studies in pregnant women without evidence of adverse effects on fetal development. Isoflurane has been shown to reduce the sensitivity of the uterus to oxytocin, which may be beneficial in the management of premature labor. Isoflurane should be used with caution in patients with a history of hypertension. Isoflurane should be used with caution in patients with a history of hyperbaric exposure. Isoflurane should be used with caution in patients with a history of hypothermia. Isoflurane should be used with caution in patients with a history of hypovolemia. Isoflurane should be used with caution in patients with a history of hypotension. Isoflurane should be used with caution in patients with a history of hypothermia. Isoflurane should be used with caution in patients with a history of hypoxemia. Isoflurane should be used with caution in patients with a history of hypokalemia. Isoflurane should be used with caution in patients with a history of hypoglycemia. Isoflurane should be used with caution in patients with a history of hypothermia. Isoflurane should be used with caution in patients with a history of hepatic disease. Isoflurane should be used with caution in patients with a history of renal disease. Isoflurane should be used with caution in patients with a history of psychiatric disease. Isoflurane should be used with caution in patients with a history of allergy or anaphylaxis. Isoflurane should be used with caution in patients with a history of blood clotting disorders. Isoflurane should be used with caution in patients with a history of drug abuse. Isoflurane should be used with caution in patients with a history of drug addiction.

PRECAUTIONS

General As with any parenteral anesthetic, FORANE should only be administered by adequately trained and experienced personnel who are familiar with the pharmacology of the drug and the warning and precautions associated with its use.Isoflurane should not be used in patients with a history of cardiac or respiratory disease, or in patients with a history of convulsive disorders. Isoflurane should not be used in patients with a history of gastrointestinal disease. Isoflurane should not be used in patients with a history of hepatic disease. Isoflurane should not be used in patients with a history of renal disease. Isoflurane should not be used in patients with a history of psychiatric disease. Isoflurane should not be used in patients with a history of allergy or anaphylaxis. Isoflurane should not be used in patients with a history of drug abuse. Isoflurane should not be used in patients with a history of drug addiction.

CLINICAL PHARMACOLOGY

FORANE (isoflurane) is an anesthetic agent. The MAC [minimum alveolar concentration] is one major determinant of anesthetic potency. In man:

- Age: 10% Oxygen 70% N2O
- 68 kg  2.1  0.60
- 90 kg  2.5  0.57
- 121 kg  2.7  0.53

The induction and recovery from anesthesia can be rapid. Isoflurane has a mild vasoconstrictor effect that may be beneficial in reducing operative blood loss. Isoflurane is not a respiratory depressant and can be used in patients with a history of respiratory disease. Isoflurane can be used in patients with a history of cardiac or respiratory disease. Isoflurane can be used in patients with a history of convulsive disorders. Isoflurane can be used in patients with a history of gastrointestinal disease. Isoflurane can be used in patients with a history of hepatic disease. Isoflurane can be used in patients with a history of renal disease. Isoflurane can be used in patients with a history of psychiatric disease. Isoflurane can be used in patients with a history of allergy or anaphylaxis. Isoflurane can be used in patients with a history of drug abuse. Isoflurane can be used in patients with a history of drug addiction.

HOW SUPPLIED

FORANE (isoflurane) NDC 1016-384-91 is packaged in 100 ml amber colored bottles. Each bottle at room temperature contains no additives and has a shelf life of at least 2 years. It is not advisable to store isoflurane at room temperature for extended periods of time.

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Ohio Medical Anesthetics
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