Minimum Drug Dose to Obtain Adequate Amnesia for Cardioversion

To The Editor:—Elective cardioversion is usually performed using sedation with short-acting barbiturates or benzodiazepine derivatives to alleviate patients' anxiety and discomfort accompanied by an electric shock. Patients undergoing cardioversion often present with coexisting cardiac dysfunction. A minimum amount of sedatives providing adequate amnesia is, therefore, most desirable. Administration of iv sedatives according to conventional clinical signs (closing of eyes and/or absence of eye lid reflex) results in a deeper level of amnesia than necessary, which may cause cardiorespiratory depression and delay in an emergence from anesthesia. Shane et al.* described an association of amnesia with a physical sign, exotropic eyes which are usually divergent, although one eye may drift inward and another outward.

This is to report our recent practice with another clinical sign, failure to focus the eyes upon a moving object. Patients are instructed to keep their eyes open and are asked to follow the finger of the anesthesiologist moving over the patient's face from side to side. While the patient breathes oxygen from a face mask, metohexital in increments of 10 mg is injected until the patient's eyes fail to follow movement of the finger. At this time, cardioversion is performed, although the patient may still appear to be awake and is responsive to verbal commands.

We have used this method in 20 patients aged 45 to 78 yr. All had excellent amnesia and quick recovery without excessive cardiorespiratory depression. Actual doses of methohexital used varied from 0.4 mg to 0.8 mg/kg. We believe that this is a useful method to insure adequate amnesia for cardioversion using a minimum amount of medication.

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Unintentional Lethal/toxic Injections: Elimination of Drugs Versus Vigilance

To the Editor:—"Life is easier when our problems, especially the serious ones, can be blamed on the tools of our trade, our patients, the gods—or anything else that has an aura of unavoidability."1

Many different drugs come in similar cartidges, ampules, and vials, and unintentional administration of the wrong drug is a known hazard.2-4* To relieve physicians, nurses, and so forth of their responsibilities by placing the "onus" of misadministration of drugs on the pharmaceutical companies ("product liability") is not uncommon.2,5* The most recent such publication involved the recommendation that the 5- and 10-ml syringes of 20% lidocaine (1 and 2 g) be eliminated.4

Abbott and Astra† are the principal pharmaceutical providers of lidocaine for ventricular arrhythmias. Their prepackaged syringes of lidocaine 100 mg/5 ml (2%) for direct intravenous injection are familiar to anesthesiologists because they are readily available in the operating suite. However, many are unfamiliar with the packaging of lidocaine for ventricular arrhythmias for dilution in intravenous fluids, namely: 1) 1 g/5 ml (20%) in prepackaged syringes; 2) 2 g/10 ml (20%) and 1 g/10 ml (10%) similarly packaged; and 3) 1 g/25 ml or 2 g/50 ml (4%) in vials.

* Sternburg S: The wrong vial, human error led to death. Chicago Tribune Section 5 (Tempo), Friday, March 8, 1985. N.B. Glutaraldehyde was injected into the subarachnoid space.

Significant differences exist between these solutions of lidocaine as to: 1) the labels on the front, back, and sides of the cartons; 2) the labels on the syringes (fig. 1) or vials; 3) the colors and shapes of the protective needle housing of the syringes (fig. 1); 4) the transfer unit for the 25–50-mL vials; and 5) the assembling instructions. However, the principal difference is the repeated, easily visible caution to dilute the 1- and 2-g solutions (fig. 1).

Before automatically injecting undiluted 1–2 g of lidocaine through a port in intravenous tubing, these differences alone should make an educated person (physician, nurse, etc.) think and read the labels on the cartons and their contents. I and others contend that the wrong use of drugs results only when physicians and nurses whose responsibility it is to inject them fail to read the label (information on carton, syringes, cartridges, vials) and/or are unfamiliar with the labeling (indications, precautions, adverse reactions, dosages, etc.) which can be obtained from the Physicians' Desk Reference or the packaged insert.

As suggested, elimination of 20% lidocaine in prepackaged syringes will prevent its injection in the future. But will the proposed alternatives, that is, having available only the 4% vials and premixed bags containing 1 or 2 g, prevent an accidental overdose? I doubt it! Surely, someone will fill a 20–50-mL syringe with 4% lidocaine and inject it intravenously undiluted, regardless of its label and labeling. Likewise, instead of administering lactated Ringer's solution rapidly, a bag or bottle with 1 or 2 g lidocaine will be given. Also, what will prevent the withdrawal of the 10% solution from a 5-ml ampule labeled for intramuscular use and administration of it intravenously, rather than intramuscularly?

To conclude, is removal of a specific packaging of a drug the answer, not only as it relates to packaging of lidocaine, but to other valuable and, perhaps, indispensable drugs, many of which come in similar ampules, and prepackaged syringes? Unintentional administration of the wrong drug, be it lidocaine or another drug, will continue unless those injecting them exert vigilance, as stated on the logo of the American Society of Anesthesiologists (see cover of this Journal).

"A stressful situation" as an excuse for physicians and nurses not clearly identifying a drug and its route of administration is invalid.

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