CORRESPONDENCE

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Should Precurarization Be Used in Obstetrics?

To the Editor:—Many current books on obstetric anesthesia recommend the use of a small dose of nondepolarizing muscle relaxant prior to administration of succinylcholine for anesthetic induction in obstetric patients. This recommendation has been supported recently by Marx and Bassell, who feel that in addition to reducing the risk of pulmonary aspiration of gastric contents, this practice is beneficial because fasciculations utilize oxygen. Since the pregnant patient already has increased oxygen consumption and reduced oxygen storage capacity, they feel that prevention of succinylcholine-induced fasciculations would provide a greater margin of safety for the mother and infant.

Reduction of aspiration risk by the use of precurarization has been attributed to preventing the rise in intragastric pressure (IGP) caused by succinylcholine-induced fasciculations. However, the chance of regurgitation is determined not by IGP alone, but by the gastroesophageal pressure gradient, i.e., the difference between the lower esophageal high pressure zone (HPZ) and IGP. Since the pressure gradient actually increases when succinylcholine-induced fasciculations occur (HPZ rises more than IGP), it appears that precurarization would, if anything, increase the risk of regurgitation. Allowing the fasciculations to occur may be of even greater benefit in the pregnant patient who is at increased risk of regurgitation because the esophageo-fundal angle is less acute, and the esophagus is already elevated, and she may have developed a hiatal hernia that is associated with a reduced pressure gradient.

Concerning maternal and fetal oxygenation, precurarization may be as great a risk as the increase in oxygen consumption resulting from fasciculations. Precurarization delays the onset, reduces the intensity, and shortens the duration of a succinylcholine-induced block. If this occurs, endotracheal intubation may be delayed and the risk of maternal and fetal hypoxia could be even greater than if oxygen consumption is increased by fasciculations. Although an increased dose of succinylcholine may overcome the adverse effects of a prior small dose of nondepolarizing relaxant, I do not feel that precurarization is advisable for the above stated reasons.

Finally, utilization of cricoid pressure at the time of induction and endotracheal intubation still remains the primary preventive measure of pulmonary aspiration of gastric contents. However, if our concern is to reduce the risk of regurgitation by increasing the gastro-esophageal pressure gradient, possibly the use of metoclopramide (but not precurarization) is the answer.

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Acute Pulmonary Embolism during Therapeutic Arterial Embolization with Silicone Fluids

To the Editor:—Capan et al. described a case of pulmonary embolism of silicone fluid in the treatment of an arteriovenous malformation of the right thigh. They proposed that isobutyl-2-cyanoacrylate (IBCA) should be one of the most desirable agents for embolizing high-flow fistulous communications because it has high tissue ad-

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hesiveness. They speculated that the incidence of pulmonary embolization should be lower with this substance than with silicone fluid.

In our hospital, IBCA has been used in the treatment of cerebral arteriovenous malformations for several years. After craniotomy, an afferent vessel is cannulated and 0.8 ml of a mixture of iodinated poppyseed oil (Iodipal®; IBCA (Bucrylate®), 4:5 is injected. In five of 16 successive embolizations, we observed signs of pulmonary embolization as evidenced by a decreased end-tidal CO$_2$, increase in central venous and pulmonary artery pressures (Fig. 1), and occasionally a decrease in systemic arterial blood pressure. Thus, in our small series, IBCA pulmonary embolism occurs at a rate of approximately 30%.

There are two factors in such events. First, dilution of Iodipal® plays a role, as the speed of polymerization is to some extent dependent on the degree of molecular separation of the monomer. Second, in our hospital the mixture is injected into the malformation without occlusion of the venous side by a balloon catheter.

Our observations confirm the conclusion of Capan et al. that measuring end-tidal CO$_2$ is a valuable diagnostic tool in these patients. One should be aware of the possibility of pulmonary embolization occurring also during the use of IBCA for selective embolization.

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