Correspondence

Optimal interval between curare pretreatment and succinylcholine

To the Editor:

I read with interest the paper by Horrow and Lambert¹ on the optimal interval between the pretreatment dose of d-tubocurarine (dTC) and succinylcholine administration to prevent muscle pains. Having suffered personally from succinylcholine-induced muscle pain it is my practice to pretreat all patients who are to receive the drug. I warn the patients that they will develop double vision and do not proceed with the induction until they report its presence. Double vision usually develops between two or three minutes after the administration of dTC. If double vision does not occur or if pressure of time necessitates an earlier induction then the fasciculations are usually not abolished.

The presence of double vision confirms the onset of action of dTC and is preferable to an arbitrary time limit which makes no allowance for differences in circulation time and other factors influencing the onset of neuromuscular blockade.

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REFERENCE

- 1 Horrow JC, Lambert DH. The search for an optimal interval between pretreatment dose of d-tubocurarine and succinylcholine. *Can Anesth Soc J* 1984; 31: 528-33.

REPLY

We appreciate Dr. Hanning's thoughtful comments. He raises two separate issues. The first, can succinylcholine-

induced fasciculations be eliminated by assuring the onset of double vision following d-tubocurarine (dTC) administration as well as by allowing at least three minutes between the dTC and subsequent succinylcholine administration? Secondly, and only implied in Dr. Hanning's letter, will abolition of fasciculations prevent post-succinylcholine myalgias?

Dr. Hanning presents persuasive arguments relating double vision induced by dTC to the prevention of fasciculations. We are not aware of any data, including our own, that support or refute this association. Our research does indicate that if one elects to wait up to seven minutes for the onset of double vision after dTC, then the onset and recovery of succinylcholine neuromuscular block will not be modified.

The association of fasciculations and myalgias is a more debatable issue. Our study confirmed others that failed to show that elimination of fasciculations prevents myalgias. We warn against liberal interpretations of Dr. Hanning's observations. Although diplopia may be an ideal marker in the prevention of visible fasciculations, prevention of myalgias as well is a less likely benefit.

Dr. Hanning's clinical observations deserve a controlled study so that they may be properly validated.

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Colour coding of stopcocks used in pressure monitoring systems

To the Editor:

Accidental intraarterial injection of drugs^{1,2} is unfortunately not a complication of the past. Commonly, both arterial and central venous pressure lines are connected to transducers with identical non-distensible tubing systems for pressure moni-

toring during anaesthesia for major surgery. Labeling¹ and use of coloured tape³ on the tubing system have been recommended to minimize this risk.

Three-way stopcocks are usually incorporated into the tubing systems for injection of drugs into the venous line or for collection of blood from the arterial line.

Coloured three-way stopcocks are now available. We have obtained on request a "pressure monitoring kit" in which red and blue stopcocks are incorporated. We use the red stopcock for the arterial line and the blue stopcock for the venous line. The use of colour-coded stopcocks will not eliminate accidents but will hopefully decrease their frequency.

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- 2 Mazumder JK, Metcalf IR, Holland AJC. Inadvertent intraarterial injection of thiopentone. *Can Anaesth Soc J* 1980; 27: 395-8.
- 3 Johnstone RE. Unusual iatrogenic problems. In: Orkin FK, Cooperman LH, eds. *Complications in Anesthesiology*. Philadelphia, Toronto: J.B. Lippincott, 1983; 689-93.

Atracurium in neonatal anaesthesia

To the Editor:

The use of atracurium as a nondepolarizing neuromuscular blocking agent in infants and children has recently been described,¹⁻³ where it has been shown to be safe, predictable and reliable. As yet there have been no reports of the use of atracurium in neonatal anaesthesia. We are thus prompted to describe our experience with this new drug in neonates.

To date we have used atracurium as the neuromuscular blocking agent in 34 neonatal anaesthetics. The gestational age of these newborn infants ranged from 33 to 44 weeks (mean 39.3 weeks), whilst their weights ranged from 1.5 kg to 4.1 kg (mean 2.79 kg).

All the neonates were intubated awake or arrived in the operating room with an endotracheal tube in situ. Atracurium was selectively used when it was felt that extubation should be possible at the conclusion of surgery. However, in six instances it was used when poor preoperative status dictated continuation of controlled ventilation into the post-operative period.

The choice of anaesthetic agents was not controlled. Nitrous oxide was avoided in those neonates undergoing laparotomy when mixtures of air and oxygen were used (14 cases). Isoflurane was the most commonly used anaesthetic agent (24 cases), whilst halothane (5 cases) and fentanyl (5 cases) were chosen equally.

Atracurium, injected immediately after intubation, was found to produce inadequate muscular relaxation (judged by surgical relaxation or inhibition of respiratory movement) unless given in a dose of at least 0.5 mg·kg⁻¹ (mean initial dose 0.59 mg·kg⁻¹).

The need for further dosage was judged either by return of respiratory effort, inadequate surgical relaxation or peripheral muscular movement. Our findings showed that premature infants and those in the first two weeks of life given comparable weight-related dosages needed further doses after a longer interval (mean 30.2 minutes) compared with term neonates in the second two weeks of life (mean 23.7 minutes).

We observed no marked changes in cardiovascular parameters after injection of atracurium, but find this difficult to quantify as anaesthetic agents were introduced simultaneously with the drug. No neonate exhibited hypotension and no skin rashes were seen.

Reversal of neuromuscular blockade was attempted in 28 instances, after discontinuation of anaesthesia, using standard doses of neostigmine and atropine. Movement was observed in several neonates even before reversal was attempted. At least 20 minutes were allowed to elapse after the last atracurium dose before neostigmine was given except in one healthy ten-day-old infant who was