LETTERS TO THE EDITOR

SIR:

I noted with interest the conclusions of Brebner and Hadley (1976) following their experiences with physostigmine. Though there is no doubt that physostigmine arouses comatose or disorientated patients, a cautionary note should be sounded against the widespread use of this agent in the recovery room.

Contrary to the authors' view, physostigmine is an analeptic drug. Goodman and Gilman's textbook (1975) comments on the effects of anticholinesterases on the central nervous system: "the EEG (shows) desynchronisation ... probably reflecting a stimulant action on the ascending reticular system. The respiratory and other subcortical centres, likewise, show stimulation after low doses ..."

Rumack (1973) warns against rapid injection of physostigmine lest convulsions are precipitated. Convulsions occurred twice in Newton's (1975) series of patients treated with physostigmine for tricyclic anti-depressant overdose; in addition, a number of patients in a pilot study convulsed (personal communication). It is surprising, therefore, that this dangerous complication was not observed in the authors' series of 110 patients. Agents with anticonvulsant properties, used during anaesthesia, may possibly confer some protection against physostigmine-induced convulsions.

Further, though Brebner and Hadley comment on the "well-known susceptibility of the older age groups to the belladonna alkaloids and also neuroleptic agents" they do not stress that avoidance of these agents in older patients would greatly reduce the necessity for "physostigmine-reversal."

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REFERENCES

- BREBNER, J. & HADLEY, L. Experiences with physostigmine in the reversal of adverse post-anaesthetic effects. *Canad. Anaesth. J.* 23, 574 (1976).
NEWTON, R. W. Physostigmine salicylate in the treatment of tricyclic antidepressant overdose. *J.A.M.A.* 231, 941 (1975).
RUMACK, B.H. Anticholinergic poisoning: treatment with physostigmine. *Pediatrics* 52, 449 (1973).

SIR:

Thank you for giving me the opportunity to reply to Dr. Houghton's comments about physostigmine.

We stand corrected and agree that physostigmine could be classified as an analeptic drug. After all, an analeptic is described as "a cordial; any restorative agent."¹

To quote Rumack in full - "Rapid intravenous injection of physostigmine should be avoided to reduce the *possibility* of convulsions." He did not state that he actually had any experience with producing convulsions with physostigmine in his

series. Obviously, if an overdose of any anticholinesterase is given, one is likely to produce convulsions. One way to give an overdose is to inject large increments e.g. 2 mg (which we give as a starting dose only to the comatose patient) too rapidly as Newton did in his series. The minimum time to see the full effect of a dose of physostigmine is five minutes. Newton was injecting 2 mg per 3 min.

Careful reading of Newton's article reveals that in the text he mentions only one patient (No. 10) in the series as having convulsions. This patient received 6 mg of physostigmine, 2 mg per 3 min intervals, according to the chart that he displays. The comments on the chart suggest that nothing happened to this patient but that another who had received only 2 mg suffered a grand mal seizure. I suspect that this is an error in plotting the chart.

Newton, despite not knowing how to use physostigmine properly, had a rather successful outcome with no problems in 17 out of 21 patients. Out of the four misadventures, one suffered from hypersalivation and another had had a cerebrovascular accident. The third patient had hypotension related to bradycardia after 4 mg of physostigmine administered at 2 mg per min. The fourth was the case of convulsions mentioned above. Newton's strong comments against physostigmine are hard to accept on the basis of his article!

Dr. Houghton suggests that – "agents with anti-convulsant properties, used during anaesthesia may possibly confer some protection against physostigmine-induced convulsions." Does he feel that we are obligated to use physostigmine after every anaesthetic? Besides, why not use a specific interaction and treat physostigmine induced convulsions with intravenous administration of scopolamine titrated to the patient's need?

In our hospital, we have found that our elderly patients have no less objection to being awake during bronchoscopies, for which they were promised sleep, than do the young ones. Nor do they appreciate the excessive secretions following the procedure if they have not received a dose of an antisialogogue. Some of the patients are also of the type who would not tolerate a tachycardia without grave risk of myocardial damage. Scopolamine seems to have very little effect on the heart rate but has excellent drying out and sedative qualities. Now that we have physostigmine readily available we feel it is safe to use scopolamine as desired. Thus we no longer need to avoid the use of belladonna alkaloids because we may need to "reverse" their effects.

In conclusion, I agree with Dr. Houghton's cautionary note about physostigmine. Any drug is dangerous if mishandled. In our recovery room we only use physostigmine as indicated. That is why the phrase *adverse* post-anaesthetic effects was put into the title.

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REFERENCE

1. The British Medical Dictionary, J.B. Lippincott Co., Montreal (1963).