Dr Dearden’s last point is more complex. We did not consider that a correlation between CC and FRC(2) would be of any physiological significance to the study and that the correlation ($r = 0.6365$) is probably related to body size and not the experiment. We did consider a correlation between FRC(1) – CC and FRC(1) – FRC(2) to be physiologically significant, but thought that there was dependency between these two variables. The coefficient for this latter correlation is $r = 0.3201$ ($P = \text{n.s.}$), and even with some dependency between the variables there is no statistical correlation. The discussion in the article is thus unaltered and the conclusions remain the same.

May I repeat my apology for the mistake in table I and thank Dr Dearden for his constructive interest.

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ATRACURIUM V. SUXAMETHONIUM IN A CASE OF
ORGANOPHOSPHOROUS POISONING

Sir,—Atracurium is a selective non-depolarizing neuromuscular blocking drug which is rapidly metabolized by Hofmann elimination, and by ester hydrolysis independent of the plasma cholinesterase activity (Hughes and Chappie, 1981). In contrast, suxamethonium is a depolarizing agent which is rapidly hydrolysed by the plasma cholinesterase. The present case report compares the effect of the inhibition of the plasma cholinesterase by parathion poisoning on the neuromuscular block of atracurium with that of suxamethonium.

The patient, a 28-yr-old man (80 kg), attempted suicide by ingesting parathion 100 ml. The patient manifested the typical picture of parathion poisoning including coma, muscle twitches and respiratory failure which necessitated prolonged tracheal intubation and controlled ventilation. After 2 weeks, the patient developed acute erosive gastritis requiring gastrectomy. A few days later, he had tracheal erosion necessitating tracheotomy. During both operations, anaesthesia was maintained with nitrous oxide in oxygen. Relaxation was achieved during the first operation by atracurium, while suxamethonium was used in the second procedure. Neuromuscular transmission was monitored by the twitch response to supramaximal stimulation of the ulnar nerve at the wrist every 10 s. In the first procedure, an initial dose of atracurium 0.5 mg kg$^{-1}$ was required to produce complete neuromuscular block which lasted for 20 min. This was followed by maintenance doses of 5 mg every 10 min. The block was non-depolarizing in nature as manifested by tetanic fade and post-tetanic facilitation. In the second procedure, suxamethonium 0.5 mg kg$^{-1}$ produced complete neuromuscular block which lasted for 45 min; the block was depolarizing in nature.

The serum cholinesterase activity was measured using propionylthiocholine as substrate by the method of Dietz, Rubenstein, and Lubrano (1973) (normal concentration in our population $4.12 \pm 1.44$ u. ml$^{-1}$). The plasma cholinesterase concentration in the patient was 0.04 u. ml on admission, and increased up to 0.56 u. ml$^{-1}$ after 3 weeks. Dibucaine No. was 89.

Parathion, an organophosphorous anticholinesterase, is the most widely used insecticide. Since, organophosphorous compounds can cross the blood–brain barrier, they inhibit central as well as peripheral acetylcholinesterase. These compounds can also inhibit the plasma cholinesterase (Barnes and Davies, 1951). In this patient, the plasma cholinesterase was 0.04 u. ml$^{-1}$ on admission and increased to 0.57 u. ml$^{-1}$ after 3 weeks. In the presence of this marked decrease of the plasma cholinesterase activity, suxamethonium produced a markedly prolonged neuromuscular blockade. In contrast, the duration of action of the blockade produced by atracurium was not greater than normal.

The present report shows that atracurium is a relatively short-acting neuromuscular blocking drug even in the presence of low plasma cholinesterase activity, and hence can be used safely in such patients.

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REFERENCES

