

TITLE: A STUDY OF BIOCHEMICAL CHANGES FOLLOWING SUCCINYLCHOLINE ADMINISTRATION IN CHILDREN WITH STRABISMUS

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It has been suggested that children with strabismus may have latent muscle disease and are more susceptible to development of masseter muscle spasm and malignant hyperthermia following succinylcholine (Sch) administration (1-3). Biochemical changes may be a pointer to more serious sequelae of Sch administration in such children. These have been investigated prospectively in the present study and compared to a control group.

Fifty-seven children with strabismus and sixty children undergoing tonsillectomy (to serve as controls) between the ages of 3 and 12 years were included in the study with the informed consent of their parents and approval from the University Ethical Committee. Within each group children were randomly allocated to be anesthetized with thiopental 4-5 mg/kg (T), halothane (H) or isoflurane (I) with nitrous oxide and oxygen. The T and H groups received Sch 1 mg/kg.

Venous blood samples (2 ml) were withdrawn prior to administration of Sch and 1, 3, 5 and 20 minutes later for estimation of serum potassium (K) and total calcium (Ca) levels. Baseline sample and a sample taken 24 hours later were analysed for serum creatinine phosphokinase levels (CPK). The results were subjected to analysis of variance for determining the statistical significance.

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TITLE: STUDY OF PIPECURONIUM - ANTIBIOTIC INTERACTION

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There is some experimental evidence and some case reports of possible interaction between some nondepolarizing muscle relaxants and certain antibiotics^{1,2}. Pipecuronium bromide is a relatively long-acting muscle relaxant resembling pancuronium structurally. This prospective study examines any interaction of pipecuronium with some commonly used antibiotics.

Fifty adult patients were studied with their informed consent and ethical committee approval. Forty received prophylactic antibiotics, the remaining 10 patients served as controls. Anesthesia was induced with fentanyl 1-3 µg/kg and thiopental 5-6 mg/kg and maintained with 70% nitrous oxide in oxygen and 0.5% halothane. The ulnar nerve was stimulated supramaximally with train-of-four (TOF) stimuli (2Hz for 2 sec at 10 sec intervals) at the wrist and the force of contraction of the adductor pollicis muscle recorded. Following stabilization of the base line responses, 10 patients each were randomly allocated to receive netilmicin (N) 2mg/kg; cefuroxime (C) 20 mg/kg; metronidazole (M) 7.5 mg/kg; or (C) 20 mg/kg and (M) 7.5 mg/kg. TOF stimulation was continued for 10 minutes following which pipecuronium was given in a dose of 45 µg/kg. The time to onset and degree of maximum block, and recovery of the first response (T₁) in the TOF sequence to 25% of control (duration) were recorded. On completion of surgery, residual neuromuscular block was antagonized with neostigmine 50 µg/kg and

The results are shown in Table 1. It is seen that administration of Sch causes some elevation in serum K and a marked increase in CPK levels in the H groups. Rise in CPK was more modest in the T groups and minimal in the I groups. Serum K decreased in the T groups with minimal changes in the I groups. The serum Ca showed a small decrease in all the groups. Our results show no difference in the response to Sch of children with or without strabismus in terms of serum K, Ca and CPK changes.

Table 1: Peak Changes in Biochemical Measurements

	Strabismus			Control		
	T	H	I	T	H	I
K (mmol/l)	-0.280	+0.255	+0.035	-0.157	+0.541	+0.064
Ca (mmol/l)	-0.029	-0.032	-0.009	-0.023	-0.031	-0.032
CPK (u/l)	+46	+619	+11	+247	+694	+27

References:

1. Ann of Clin Res 2: 126-130, 1970.
2. Anesthesiology 61: 772-775, 1984.
3. Br J Anaesth 65: 66P, 1979.

glycopyrrolate 10 µg/kg and the time to recovery of a TOF ratio of 0.7 recorded. Results were subjected to analysis of variance and t-tests.

Some of the results are shown in Table 1. None of the antibiotics produced any measureable block. The degree of maximum block or the time taken to attain it, were not significantly different. The time to 25% recovery was significantly prolonged only in the group receiving netilmicin, confirming that like many other relaxants, the effects of pipecuronium are prolonged in the presence of aminoglycoside antibiotics. There was however, no difficulty in antagonising the block in any group, sustained TOF ratios of 0.7 or more being attained in less than 4 minutes.

References:

1. Anesth Analg 61: 767-770, 1982.
2. Anaesthesia 42: 858-860, 1987.

Table 1: Neuromuscular profile of pipecuronium in the presence of various antibiotics

	N	C	M	C&M	Control
Max Block (%)	99±1.6	98±1.6	98±1.8	98±2.7	98±1.6
Onset (min)	3.5±1.1	3.5±0.6	3.4±0.6	3.6±1.2	3.6±0.4
Duration	69±12.5*	50±13.8	53±9.4	51±10.0	48±11.3
Time to TOF ratio of 0.7	3.5±1.7	3.6±1.1	3.6±1.2	3.7±2.8	3.3±1.7

Mean±SD; * P<0.05 in comparison to other groups.