Title: EFFECTS OF UPPER LIMB DOMINANCE ON SENSITIVITY TO SUCCINYLCHOLINE

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Introduction: The responses to ulnar nerve stimulation may differ between the two arms and handedness may play a role. If such an effect exists it might influence the results when new neuromuscular monitoring devices are being evaluated with a different one (e.g. MMG, EMG, accelograph) on each arm. The measured potency of neuromuscular blocking agents could also be affected.

Methods: We compared the potency of succinylcholine (Sch) in both arms simultaneously using a cumulative dose plus infusion technique[1] and integrated EMG monitoring of the first dorsal interosseous muscles. Following institutional review board approval and written informed consent, we studied 19 ASA 1 or 2 patients scheduled to undergo elective procedures under N_2O/O_2, fentanyl anesthesia. Following induction of anesthesia, supramaximal trains-of-four (TOF) stimuli were simultaneously applied bilaterally to the ulnar nerves at the wrists at 10 sec intervals. The EMG responses of the first dorsal interosseous muscles were continuously recorded bilaterally using two Datex 221 integrated EMG monitors. Sch, 0.10 mg/kg, was administered followed by intermittent boluses of 0.05 mg/kg, together with an infusion of Sch, the rate of which was adjusted to replace calculated eliminated drug,[1] until 95% depression of the first TOF response compared with control (T1/C) was achieved. A log dose-logit response curve using linear regression analysis was plotted for each limb of each patient. From these curves individual and mean ED50 and ED95 values were derived. The mean ED values for the dominant side were compared with those of the non-dominant side using a student t test for paired data. A value of $P \leq 0.05$ was considered significant.

Results: We did not find significant differences in ED values for Sch between the dominant and non-dominant arms.

Discussion: A difference between the two arms in TOF MMG responses to non-depolarizing muscle relaxants has been reported.[2] Our data suggest that potency measurements of Sch are not affected by upper limb dominance.

References: 1. Anesthesiology 69:338-342, 1988.
2. Anesthesiology 71:3A,A823, 1989.

TABLE Values are means ± SD

	Dominant	Non-Dominant
ED50 (mg/kg)	0.17 ± 0.04	0.17 ± 0.05
ED50 (mg/kg)	0.29 ± 0.08	0.31 ± 0.07

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TITLE: **PHARMACOKINETICS, NEUROMUSCULAR EFFECTS AND BIODISPOSITION OF 3-DESACETYLVECURONIUM IN CATS**

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Persistent neuromuscular blockade in critically ill patients may follow the discontinuation of a long-term administration of vecuronium (VEC).[1] This may be due to the accumulation of 3-desacetylvecuronium (3-desVEC), the principal metabolite of VEC, which, in cats, has 50% of the neuromuscular blocking potency of VEC.[1,2] To determine whether 3-desVEC is primarily eliminated by the liver or the kidney, we assessed the pharmacokinetics, neuro-muscular effects and biodisposition of 3-desVEC in cats during kidney or liver failure.

17 cats were divided into 3 groups: 6 controls, 5 with kidney failure induced by ligation of both renal pedicles, and 6 with galactosamine-induced liver failure.[3] After iv injection of 3-desVEC (300 µg/kg), arterial blood, urine and bile samples were collected for 6-8 h. The livers were then excised for analysis. The twitch tension of the tibialis anterior muscle evoked by supramaximal stimulation (0.2 ms, 0.1 Hz) of the sciatic nerve was measured. The intervals from injection to maximum depression of the twitch tension (onset), from injection to recovery of 90% of the baseline twitch tension (duration of action), and from 25% to 75% of the baseline twitch tension (recovery index) were measured. Concentrations of 3-desVEC in plasma, urine, bile and liver homogenates were measured by capillary gas chromatography. Plasma concentration *vs* time data were described by a 2- or 3-compartment kinetic model as appropriate for each cat. Volume of distribution at steady state (Vd_{SS}), plasma clearance (Cl), and elimination half-life ($t_{1/2\beta}$), were calculated. Variables were compared using nonparametric tests. Differences were considered significant at $P < 0.05$.

90±11% of 3-desVEC injected dose were recovered in urine, bile, and liver in all groups (table 1). No other putative metabolites was detected. In cats with liver failure, 3-desVEC had a longer duration of action and recovery index and a slower clearance, than in control group (table 2). No change in kinetic or dynamic variables were observed in kidney failure cats.

Our results indicate that, in cats, 3-desVEC is predominantly eliminated *via* the liver, and to a lesser extent *via* the urine.

References: 1. ANESTHESIOLOGY 72:566-570, 1990.
2. Br J Anaesth 57:789-795, 1985.
3. Gastroenterology 74:664-671, 1978

Table 1. **Recovery of 3-desacetylvecuronium.** (mean ± SD) (% of the injected dose). * = $P < 0.05$ *vs* controls.

	Urine	Bile	Liver	Total
Controls	19±14%	36±17%	35±7%	86±7%
Renal Failure	0	48±14%	49±9%	97±11%
Liver Failure	40±24%	0	45±17%	88±11%

Table 2. **Neuromuscular (means ± SD) and pharmacokinetic variables (medians).** * = $P < 0.05$ *vs* controls.

	Controls	Kidney Failure	Liver Failure
Onset (min)	0.5±0.1	0.5±0.1	0.5±0.1
Duration of Action(min)	82±32	53±33	168±62*
Recovery Index(min)	10±4	9±8	39±19*
Cl (ml/kg/min)	15.6	17.7	4.3*
V_{dss} (l/kg)	0.55	0.38	0.40
$T_{1/2}$ (min)	70	46	77