Title : DOXACURIUM (BW 938) VERSUS PANCURONIUM IN PATIENTS UNDERGOING ABDOMINAL AORTIC SURGERY : EFFECTS ON HEMODYNAMICS AND LV FUNCTION.

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INTRODUCTION. In patients with cardiovascular disease, the hemodynamic effects of currently used non depolarizing muscle relaxants, may be poorly tolerated (1). Doxacurium (D) is a new long acting non depolarizing muscle relaxant which appears to have minimal hemodynamic effects in high risk patients (2). To better assess hemodynamic and left ventricular function response to this new relaxant in patient undergoing abdominal aortic (AA) surgery, we conducted a randomized study which compared it to the widely used pancuronium. Global and segmental LV function (a sensitive marker of ischemia) were determined using 2-D transesophageal echocardiography (TEE). Such a study also gave us the opportunity to determine the incidence of myocardial ischemia when each of these relaxants is used in conjunction with low dose fentanyl (6 mcg/kg) and a benzodiazpine in patients undergoing AA surgery.

METHODS. Eighteen patients undergoing AA surgery were included in this randomized study which was approved by the subcommitte on Human studies. All had preoperative dipyridamole thallium gammatomography and gated radionuclide angiography. We excluded patients under beta-blockers, and those with a preoperative ejection fraction < 40 %. Usual cardiac medications were given 2 hours before induction. Radial and pulmonary artery catheters were inserted after premedication with morphine 5 mg and scopolamine 0.5 mg. Patients were randomly divided into two groups according to the relaxant given : group P n = 9, group D n = 9. Following induction of anesthesia with iv fentanyl (6-8 mcg/Kg) and midazolam (0.2-0.5 mg/Kg) tracheal intubation was facilitated by a local anesthetic spray. Then ventilation was controlled with 40 % O2 in air to maintain an arterial PaCO2 of 30-35 mmHg. A TEE probe (Diasonics 3.5 MHz) was now inserted and positioned to obtain a short axis view of the left ventricle at the level of the papillary muscles while maintaining the most spherical ventricular shape. Patients then received 1.5 x ED95 of either D (0.037 mg/Kg) (n = 9) or P (0.085 mg/Kg) (n = 9). A modified lead V5 ECG was continuously monitored throughout the study. Hemodynamics and TEE measurements were performed immediately after induction while under mechanical ventilation after a steady state had been reached, and repeated 2 min, 5 min and 10 min after P or D injection. Surgery did not begin until the study concluded. Retrospectively using the Diasonics computer, three consecutive end-diastolic (EDa) and end-systolic (ESa) areas were outlined and averaged by an independent "blinded" observer, who focused special attention in the detection of new segmental wall motion abnormalities (SWMA). The ejection fraction area (EFa) was calculated as follow (EDa-Esa)/EDa x 100. Data are presented as mean ± SEM and analysed using 2 way analysis of variance.

RESULTS. Both groups were comparable with respect to age (64 vs 60), chronic drug therapy and hemodynamics at control. Preoperative radionuclide study data were similar : ejection fraction 59 vs 55 % ; number of territories with persistent thallium defect 1 vs 3, with redistribution 10 vs 9. No ischemic ST segment changes were noted in either group. However, one patient developed 4 minutes after P administration a typical new SWMA in the septal area. This indicator of ischemia was associated with a 33 % increase in MAP with relation to the P pre-injection value. Hemodynamic and echocardiographic data are presented in the table. Inter group data analysis revealed a significant increase in mean arterial pressure (MAP) and EDa in patients receiving P, and a slight but significant decrease in heart rate (HR) in patients receiving D. Intra group comparison revealed a higher HR in the P group.

DISCUSSION. Although patients receiving beta-blockers were excluded from the study, HR did not increase significantly when P was given concomitantly with low dose fentanyl and a benzodiazepine, unlike it has been shown to do with patients receiving high dose fentanyl (1). However, we did note after P injection a significant increase in MAP, and EDa which may have played a role in our patient, who developed a new SWMA. Except for a slight but significant decrease in HR, hemodynamics and LV function were not affected by D, when given in combination with low dose fentanyl and a benzodiazepine in patients undergoing AA surgery.

		AFTER INDUCTION	P OR D INJECTION +2 min	+5 min	+10 min
MAP mmHg	P	69±3	76±5*	76±4*	76±5*
	D	73±3	66±3	67±3	72±4
HR b/min	P	65±4	70±5 ●	67±4	66±4
	D	67±4	61±3*	60±3*	61±3*
CI l/min/m2	P	2.7±0.3	2.9±0.2	2.8±0.2	2.7±0.2
	D	2.9±0.2	2.9±0.2	2.8±0.2	2.9±0.3
PCP mmHg	P	9±2	9±2	9±2	10±2
	D	9±1	8±2	9±1	9±1
ESa cm2	P	8.5±1.1	9.5±1.1	9.6±1.1	9.8±1.1
	D	7.9±0.6	7.7±0.5	7.5±0.6	7.9±0.5
EDa cm2	P	16.3±1.3	17.8±1.3*	17.8±1.3*	18.5±1.3*
	D	16.6±0.8	16.6±0.7	16.8±0.8	16.9±0.6
EFa %	P	49±3	47±3	46±3	48±3
	D	52±3	53±3	54±3	53±3

* $p < 0.05$ vs post-induction, ● $p < 0.05$ P vs D

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