

Title : NICARDIPINE vs TRINITRINE FOR TREATMENT OF POST-OPERATIVE HYPERTENSION :
EFFECTS ON HEMODYNAMICS AND LEFT VENTRICULAR FUNCTION.

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Postoperative hypertension (HT) in abdominal aortic surgery is a common event requiring treatment. Because of their preferential vasodilator properties, dihydropyridine calcium channel blockers represent an interesting group of drugs useful in this instance. Nicardipine (NCD), a new drug under this category may be given intravenously since it is photosensitive and water soluble. In addition, it has been shown to cause less myocardial depression than nifedipine (1). The aim of this randomized study was to compare the effects of NCD and nitroglycerin (NTG) on hemodynamic and left ventricular (LV) function assessed by 2-D transesophageal echocardiography (TEE) when these agents are used iv for the treatment of postoperative HT.

METHODS. With approval from our Ethics Committee and informed consent, we randomly assigned 29 patients undergoing abdominal aortic surgery to receive either NCD or NTG to treat postoperative HT. We excluded patients with a history of angina pectoris, congestive heart failure, or those with preoperative systolic blood pressure (SBP) greater than 160 mmHg. Usual cardiac medications were given up until 2 hours before surgery. After IM premedication (morphine 5 mg and scopolamine 0.5 mg) radial and pulmonary artery catheters were placed. Anesthesia was induced with fentanyl, a benzodiazepine and pancuronium, and maintained with increments of drugs while under controlled ventilation (N2O 60 % in O2). Halothane was additionally administered to control intraoperative HT. Postoperatively, patients were admitted to recovery unresponsive under fentanyl sedation. Mechanical ventilation with heated humidified O2 in air (50 %) and fentanyl sedation were continued during at least the three first postoperative hours. During this period, when SBP increased above 165 mmHg, patients were treated with either NCD (n = 15) or NTG (n = 14). These agents were administered iv in successive boluses (NTG 0.5 mg or NCD 0.3 mg) every 20 seconds, to achieve the same SBP as that seen before induction. This was followed by a continuous infusion started at the dose of 1.5 mcg.kg-1.min-1 of NTG or 3 mg/hour of NCD and adjusted to maintain SBP as close as possible to preinduction values. A TEE transducer (Diasonics 3.5 MHz) was inserted upon arrival in the recovery room. Hemodynamic and echocardiographic measurements were performed during the hypertensive episode and repeated 1) when SBP returned to its preinduction value, and 2) 15 minutes later, under continuous infusion. In each patient a 2-D TEE short axis view of the LV at the level of the papillary muscles was obtained while maintaining the most spherical ventricular shape. Retrospectively, three consecutive end-diastolic (EDa) and end-systolic (ESa) areas were outlined with a light pen and averaged by an independent "blinded" observer. The ejection fraction area (EFa) was then calculated. Data are presented as mean±SEM, and in each group were assessed using analysis of variance. Comparisons between the two

groups were performed using Student t - test.

RESULTS. Both groups did not differ with respect to age (60 vs 65), preinduction hemodynamic parameters, previous history of HT (10 vs 12) or preoperative treatment. Mean bolus doses were : 3.7 ± 0.5 mg NTG and 1.7 ± 0.2 mg NCD, mean maintenance doses were 2.8 ± 0.3 mcg.kg-1.min-1 of NTG, and 1.1 ± 0.2 mcg.g-1.min-1 of NCD. Hemodynamic and echocardiographic data recorded during postoperative HT, after bolus administration, and 15 minutes later under continuous infusion, are presented in table I. In 3 patients echocardiographic images could not be interpreted. In both groups the control of HT was associated with an increase in Efa, but cardiac index increased only in patients receiving NCD. After bolus administration, stroke index (SI), PCWP, EDa are significantly lower in the NTG group, when compared to the NCD group.

DISCUSSION. Both NCD and NTG are efficacious in the rapid treatment of postoperative HT in patients undergoing abdominal aortic surgery. Both ameliorate LV function by allowing a better emptying of the ventricle. Our results emphasize that the effects on capacitance vessels seen with these two drugs when used to treat post operative HT are readily apparent. A significant decrease in PCWP and EDa was observed only in the NTG group. Such a difference in preload explains the lower stroke index in these patients. Cardiac output significantly increased only in the NCD group. The difference observed among some of the hemodynamic effects of these two drugs must be taken into account when choosing the best treatment for postoperative HT.

		HTA	BOLUS	MAINTENANCE
MAP	NTG	123±4	84±4*	102±5*
	NCD	119±5	100±4*	96±4*
n = 29				
HR	NTG	81±6	92±5*	88±5*
	NCD	81±5	93±7*	98±6*
n = 29				
PCWP	NTG	12±1	7±1*	8±1*
	NCD	12±1	11±1□	11±1□
n = 29				
CI	NTG	3.7±0.5	3.5±0.3□	3.7±0.3□
	NCD	4.2±0.3	4.8±0.3*	5.1±0.3*
n = 26				
SI	NTG	49±5	39±4*	43±4
	NCD	52±3	52±3□	53±4□
n = 26				
ESa	NTG	5.9±0.8	3.4±0.4*	3.9±0.5*
	NCD	5.5±0.6	4.2±0.2*	4.4±0.5*
n = 26				
EDa	NTG	15.9±1	12.6±1*	13.4±1*
	NCD	15.3±1	15.4±1	15.8±1
n = 26				
EFa	NTG	63±4	72±2*	70±2*
% n = 26	NCD	64±3	72±3*	72±2*

*p < 0.05 vs HT ; □ p < 0.05 NCD vs NTG

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