

Hopital Universitaire du Bocage
F21034
Dijon
France

REFERENCES

1. Dietrich W, Spannagl M, Jochum M, Wendt P, Schramm W, Barankay A, Sebening F, Richter JA: Influence of high dose aprotinin treatment on blood loss and coagulation patterns in patients undergoing myocardial revascularization. *ANESTHESIOLOGY* 73:1119-1126, 1990

Anesthesiology
75:380, 1991

2. Juhan-Vague I, Valadier J, Alessi MC, Aillaud MF, Ansaldi J, Philip-Joet C, Holvoet P, Serradimigni A, Collen D: Deficient t-PA release and elevated PA inhibitor levels in patients with spontaneous or recurrent deep venous thrombosis. *Thromb Haemost* 57:67-72, 1987
3. Commin PL, Lu H, Soria C, Caen JP, Pivnicka A, Echter A: Etude contrôlée sur les mécanismes de réduction du saignement induits par l'aprotinine au cours des CEC. *Ann Fr Anesth Reanim* 9: R97, 1990

(Accepted for publication May 16, 1991.)

Inotropic Effect of Amrinone

To the Editor:—The article by Rooney *et al.*¹ is a worthwhile contribution to our understanding and appreciation both of the character and of the limitation of amrinone as an inotropic agent in surgery and anesthesia. Over a decade since becoming clinically available, amrinone, unlike dobutamine, has gained little popularity in surgical as well as other anesthetized patients who need urgent hemodynamic support. Without the indirect effect from afterload reduction, amrinone can be considered only a mild or weak inotropic agent, as shown by the isovolumetric peak left ventricular pressure increase of 12.8% after 500 μ M. For patients without heart failure, the afterload reduction effect of amrinone may not be beneficial.

Recently, in a different preparation, we studied the direct effect of infusion of amrinone on isolated rabbit myocardial septum.² With concentrations ranging from 1 to 1,000 μ g/ml, the results showed that at concentrations greater than 10 μ g/ml, amrinone caused slight (5–11%) increases in peak developed tension and maximal acceleration (dT/dt). In contrast to Rooney *et al.*'s study, we did not observe a dose-dependent increase of contractility. Our conclusion is that amrinone is not a strong inotropic agent and cannot be treated the same as dobutamine or dopamine.

TAI-SHION LEE, M.D.
Associate Professor

Anesthesiology
75:380-381, 1991

In Reply:—We appreciate the interest of Lee and Virtusio regarding our work describing the isolated cardiac effects of amrinone.¹ Their particular concern is whether amrinone is really much of a positive inotropic agent. We agree that it has only a mild positive inotropic effect *in vitro*. Perhaps it does not produce much of a tachycardia because it is also not a potent direct positive chronotropic agent. We also observed that amrinone did not produce coronary vasodilation above the metabolic demand in the isolated heart. Its major effect *in vivo* probably is peripheral venodilation and arteriolar vasodilation.² With administration of amrinone, the increase in cardiac output without a change in myocardial oxygen consumption in patients with congestive heart failure likely reflects a reduction in afterload and enddiastolic ventricular volume more than it does a direct positive inotropic effect.³ A reduction in ventricular filling pressure by amrinone may decrease wall tension in patients with dilated ventricles and so counteract any increase in myocardial oxygen consumption due to a direct mild inotropic effect. Higher loading doses than originally recommended, however, may result in a greater inotropic effect.⁴

LOURDES VIRTUSIO, M.D.
Research Associate

Department of Anesthesiology
University of California—Los Angeles School of Medicine
Harbor/University of California—Los Angeles Medical Center
1000 West Carson Street
Torrance, California 90509

REFERENCE

1. Rooney RT, Stowe DF, Marijic J, Bosnjak ZJ, Kampine JP: Amrinone reverses cardiac depression and augments coronary vasodilation with isoflurane in the isolated heart. *ANESTHESIOLOGY* 74:559-567, 1991
2. Lee TS, Virtusio L, Lin Y: Amrinone on denervated rabbit myocardium: A poor inotropic agent (abstract). *Chest* 98:70S, 1990

(Accepted for publication May 20, 1991.)

Differences in inotropy *in vivo* and *in vitro* may be due to species differences or to adrenergic stimulation. Amrinone may be more effective in the presence of catecholamines, and afterload reduction may stimulate an adrenergic response. Whether amrinone or traditional drugs such as digitalis, epinephrine, isoproterenol, dopamine, or dobutamine are better choices for inotropic support, alone or with peripheral vasodilators, after cardiopulmonary bypass has been debated recently.^{4,*} The combined use of amrinone and other inotropic agents also has been discussed. It appears that milrinone and other newer phosphodiesterase III inhibitors† under development have greater positive inotropic effects that may approach the effects of the natural and synthetic catecholamines.

DAVID F. STOWE, M.D., PH.D.
Associate Professor of Anesthesiology and Physiology
The Medical College of Wisconsin
Staff Anesthesiologist

Veterans Affairs Medical Center
MFRC, Room A1000
8701 West Watertown Plank Road
Milwaukee, Wisconsin 53226

* Estafanous FG: The choice of inotropes following cardiopulmonary bypass: *Con*: Amrinone is not a first-choice inotropic following cardiopulmonary bypass. *J Cardiothor Vasc Anesth* 5:184-186, 1991.

† Al-Wathiqui MH, Shimshak TM, Brooks HL, Preuss KC, Wynsen JC, Gross GJ, Warltier DC: Comparative effects of inotropic agents on coronary and systemic hemodynamics of conscious dogs: Actions of milrinone, dopamine, ouabain and MCI-154. *Pharmacology* 36:217-227, 1988.

REFERENCES

1. Rooney RT, Stowe DF, Marijic, Bosnjak, Kampine JP: Amrinone reverses cardiac depression and augments coronary vasodilation

Anesthesiology
75:381, 1991

Peripheral Nerve Injury and Automatic Blood Pressure Measurement

To the Editor:—In a recent report¹ describing radial nerve injury in association with use of an automated blood pressure monitor, the authors stated that they were unaware of any publication reporting on radial nerve injury caused by a blood pressure cuff.

In 1982 we published a report² describing radial nerve injury due to automatic blood pressure measurement in a cachectic patient (50 kg and 172 cm) with very thin arms.

Our conclusion then was that in very light-weight patients, automatically cycled blood pressure monitors should be applied only when brief intervals between measurements is not demanded. Continuous noninvasive blood pressure measurement with a new operational concept using the unloaded artery principle of operation* has proved a useful monitor³ without detrimental effects to the finger, where the cuff for the measurement is applied.⁴

In addition, we would like to bring to your attention a case describing radial nerve palsy in a premature infant after long-term measurement of blood pressure.⁵

HEIDI M. SCHAEER, M.D.
*Institute for Anesthesiology and Intensive Care
University Hospital
Inselspital
3010 Bern
Switzerland*

Anesthesiology
75:381-382, 1991

A Cause for Hemodynamic Instability during Hepatic Tumor Resection

To the Editor:—Elevated concentrations of circulating catecholamines have not previously been reported in association with primary hepatic tumors. We would like to report a 10-month-old baby girl with an intrahepatic tumor who developed severe hemodynamic instability during surgical resection. The highest preoperative blood pressure

was 120/80 mmHg, recorded while the patient was crying vigorously. Preoperatively, serum glutamic-oxaloacetic transaminase, serum glutamic-pyruvic transaminase, alkaline phosphatase, and lactate dehydrogenase concentrations were increased, and the α fetoprotein concentration was normal. Celiac and superior mesenteric arteriography

2. Benotti JR, Grossman W, Braunwald DH, Carabello BA: Effects of amrinone on myocardial energy metabolism and hemodynamics in patients with severe congestive heart failure due to coronary artery disease. *Circulation* 62:28-34, 1980
3. Wilmshurst PT, Thompson DS, Juul SM, Ditttrich HC, Dawson JR, Walker JM, Jenkins BS, Coltart DJ, Webb-Peploe MM: Effects of intracoronary and intravenous amrinone infusion in patients with cardiac failure and patients with near normal cardiac function. *Br Heart J* 53:493-506, 1985
4. Hines R: The choice of inotropes following cardiopulmonary bypass: *Pro*: Amrinone is a first-choice inotrope following cardiopulmonary bypass. *J Cardiothor Vasc Anesth* 5:181-183, 1991

(Accepted for publication May 20, 1991.)

* Penaz J: Photoelectric measurement of blood pressure, volume, and flow in the finger. Tenth International Conference on Medical and Biological Engineering, 1973, p 104.

REFERENCES

1. Bickler PE, Schapera A, Bainton CR: Acute radial nerve injury from use of an automatic blood pressure monitor. *ANESTHESIOLOGY* 73:186-188, 1990
2. Schaer HM, Tschirren B: Nervus radialis-Parese infolge automatischer Blutdruck-Messung. *Anaesthesist* 31:151-152, 1982
3. Friedman DB, Jensen FB, Matzen S, Secher NH: Noninvasive blood pressure monitoring during head-up tilt using the Penaz principle. *Acta Anaesthesiol Scand* 34:519-522, 1990
4. Smith NT, Wesseling KH, DeWit B: Evaluation of two prototype devices producing noninvasive, pulsatile, calibrated blood pressure measurement from a finger. *J Clin Monit* 1:17-29, 1985
5. Tollner U, Bechinger D, Pohlandt F: Radial nerve palsy in a premature infant following long-term measurement of blood pressure. *J Pediatr* 96:921-922, 1980

(Accepted for publication May 22, 1991.)