

## REPORT OF SCIENTIFIC MEETING

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### Society of Cardiovascular Anesthesiologists 9th Annual Meeting

The 9th Annual Meeting of the Society of Cardiovascular Anesthesiologists was held at the Marriott Desert Springs Resort, May 10-13, 1987. Topics for discussion included: 1) hemostasis, 2) aorto-iliac surgery, and 3) receptors and mediators of cardiovascular systems.

#### HEMOSTASIS

Bleeding remains one of the most common complications of cardiopulmonary bypass, requiring reoperation in as many as 3% of patients. Norig Ellison (University of Pennsylvania) chaired a panel on advances in hemostatic management in which Frederick Campbell (University of Pennsylvania) presented results of clinical trials of Iloprost (ZK), a synthetic prostacyclin analog. Used by continuous infusion, it inhibits platelet aggregation by stimulating adenylyl cyclase to produce increased levels of cyclic AMP. Because it has a 15-30 min half-life, cessation of the infusion results in a prompt return of platelet function. Areas of potential benefit include prolonged exposure to synthetic surfaces of extracorporeal circuits (LVAD, ECMO) and heparin-induced thrombocytopenia (H.I.T.). Six patients with H.I.T. at University of Pennsylvania have successfully undergone cardiopulmonary bypass using Iloprost inhibition of platelet aggregation.

Bleeding complications after cardiopulmonary bypass partly result from a hemorrhagic tendency induced by many factors, including qualitative and quantitative platelet defects. J. Anthony Ware (Beth Israel) demonstrated significantly less blood loss during operation, within 12 h, and 12-24 h postoperatively in patients receiving iv desmopressin acetate (0.3  $\mu\text{g}/\text{kg}$ ) adminis-

tered immediately after protamine, as compared with those receiving placebo only. The beneficial effect of desmopressin acetate may be related to changes in von Willebrand's factor, although this is unclear.

Stead and Bloor (UCLA) presented data supporting the use of *in vivo* measurements of residual heparin by protamine titration rather than activated clotting time (ACT) alone. Patients whose protamine dose was determined by protamine titration required less protamine and significantly fewer units of packed RBCs than did those in whom heparin dose was determined by ACT alone.

Levy *et al.* (Emory) presented results of clinical and laboratory evidence of protamine allergy in six patients with known fish allergies. A radioenzymatic assay was used to measure histamine released in samples of the patients' blood which had been incubated with protamine. Although two patients demonstrated low-level sensitization, none developed clinical reactions after the administration of protamine, leading the investigators to conclude that the presence of fish allergies is not a contraindication to the administration of protamine.

Gravlee *et al.* (Wake Forest) measured serially the peak effect of heparin, 300 units/kg into the right atrium, in 30 patients undergoing elective coronary artery bypass grafting (CABG). Because ACT in the 20-min sample was significantly less than in prior samples, they concluded that a delay in initiation of cardiopulmonary bypass beyond 20 min after heparin administration may be clinically significant if a 5-min ACT shows borderline anticoagulation.

Zulys *et al.* (Toronto) tested the safety of ancrod, which is derived from Malayan pit viper venom, for anticoagulation for cardiopulmonary bypass in 20 patients undergoing CABG. An ancrod infusion was

begun 24 h prior to surgery and titrated according to fibrinogen levels. Postoperative hemostasis was achieved with epsilon aminocaproic acid. Compared to patients receiving heparin and protamine, patients who received ancrod had similar blood loss and packed cell and stored plasma requirements; however, some patients who received ancrod required cryoprecipitate, whereas controls did not. The authors proposed the use of ancrod in patients with protamine allergy or heparin-induced thrombocytopenia.

#### AORTO-ILIAC SURGERY

In a panel on abdominal aortic reconstructive surgery, Ira Isaacson (Emory) presented an algorithm for the preoperative assessment of high risk patients for aortic surgery. He advocated stress-testing with Dipyridamole-thallium scans in patients with mild or suspected coronary artery disease. Additionally, he noted that patients for abdominal aortic reconstructive surgery who received intrathecal morphine had shorter hospital stays.

Christopher *et al.* (Johns Hopkins) studied two-dimensional short axis echocardiograms of the left ventricle at the level of the papillary muscles in ten patients undergoing supraceliac aortic cross-clamping for repair of aortic aneurysms. Changes in regional wall thickening varied both between patients and between segments, and were not reflected by changes in cardiac index. Although cardiac index often increased after supraceliac cross-clamping, it was often accompanied by decreased segmental wall thickening consistent with ischemia.

A presentation by Wilton *et al.* (University of Michigan) dealt with silent preoperative ischemia in patients scheduled for CABG. Of 20 patients studied with continuous electrocardiographic (Holter) monitoring of leads II and V5 from admission to the time of sternotomy, six had ischemic episodes. In five of the six patients, some of these episodes occurred during sleep. Because most of the episodes were accompanied by minimal changes in heart rate, the investigators concluded that the problem was one of myocardial supply, not demand.

#### CARDIOVASCULAR MEDIATORS AND RECEPTORS

Gerald Reves (Duke) chaired a basic science update panel in which John Leslie (Duke) discussed mediators in the cardiovascular system not specifically related to alpha- or beta-adrenoceptors. Mervyn Maze (Stanford) summarized the current state of knowledge of alpha-

and beta-adrenergic receptor and homologous regulation.

A number of scientific presentations dealt with adrenergic responsiveness. Schwin *et al.* (Duke) generated pressor dose response curves using a phenylephrine bolus technique prior to and during anesthesia and cardiopulmonary bypass in patients with impaired left ventricular function undergoing CABG. They demonstrated no down-regulation of alpha-adrenergic responsiveness in patients with impaired left ventricular function; however, they also noted: 1) that pressor responses to phenylephrine were increased during cardiopulmonary bypass, as compared with those during other intervals of CABG operations, and 2) that pressor responses (as compared with those prior to anesthesia) were increased in patients receiving fentanyl anesthesia.

De Bruijn *et al.* (Duke) tested the responses to isoproterenol challenge and surgical stimulation of patients on cardioselective (atenolol or metoprolol) and noncardioselective (propranolol) beta blockers scheduled for CABG. Responses to surgical stimulation were similar in both groups. Isoproterenol, however, produced greater increases in heart rate in those receiving cardioselective treatment, supporting the evidence that beta-2 receptors in the heart mediate positive chronotropic responses. They concluded: 1) that both cardioselective and nonselective beta blockers provided similar protection from adrenergic-mediated stressful stimuli during CABG surgery, 2) that the physiologic effects of endogenous sympathetic stimulation are not predicted by isoproterenol challenge, 3) that isoproterenol will produce greater heart rate increases in patients on cardioselective than nonselective beta blockers, and 4) that isoproterenol challenge must be interpreted in the light of the particular beta-adrenergic blocking drug that the patient receives.

Of several papers dealing with hemodynamic calculations, one was of particular note. Beattie *et al.* (Johns Hopkins) measured central venous pressure (CVP) and MAP in patients undergoing implantation of an automatic internal defibrillator. Ventricular fibrillation was induced to test the device in these patients. During fibrillation, MAP decreased to 21 mmHg, while CVP rose from 7.7 to 11.8 mmHg. They suggested that this persistent gradient of 10 mmHg during a prolonged period of zero flow implies a functional discontinuity between the arterial and venous system; therefore, a waterfall or closing pressure (EDP) of 21 mmHg existed, compared to the 7.7 mmHg which would ordinarily be used in calculating systemic vascular resistance (SVR). In addition,  $dAP/dt$  was determined and plotted against MAP to extrapolate to EDP. The resulting

curve was bimodal: at higher pressures, the EDP obtained was 45 mmHg, whereas the terminal portion of the curve extrapolated to 22 mmHg. Because most operating conditions are at the higher pressures, it was suggested that the appropriate EDP in these patients was 45 mmHg, and that serious error could be introduced when SVR is calculated using a CVP obtained at widely different arterial pressures.

Dr. George Burgess, III, was inducted as president by outgoing President Dr. Paul Barash. The Society will

hold its 10th Annual Meeting at the New Orleans Sheraton, April 10, 1988.

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