

## Literature Briefs

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*Literature Briefs were submitted by Drs. C. Battil, B. Geffin, M. Laver, E. Lowenstein, and H. Pontoppidan. Briefs appearing elsewhere in this issue are part of this column.*

### Circulation

**ELECTROCARDIOGRAM AND EXERCISE** The temporal relation between controlled exercise and electrocardiographic changes in young healthy humans athletically trained and untrained was subjected to continuous recording and computer analysis. In each of the two groups, amplitude and slope of predetermined points of the ST segments revealed a predominantly downward displacement of as much as 1 mm (1 mm = 0.1 mV). These ischemia-like changes were associated with an increasing change of slope, commensurate with severity of exercise, continuing after its cessation and followed by elevation of the ST segment during the postexercise minute. Trained subjects differed from untrained subjects in that ST segments at rest were higher, mean heart rate was lower (75 vs. 92 beats/min), the scatter of values was less, and ST depression progressed with severity of exercise. Aspects of false-positive and false-negative results in exercise testing are discussed. (Davies, C. T. M., and others: *Computer Quantitation of ST Segment Response to Graded Exercise in Untrained and Trained Normal Subjects*, *Cardiovasc. Res.* 5: 201-209, 1971.) **ABSTRACTER'S COMMENT:** Apparent ischemic changes elicited by refinements in analysis suggest the need for caution when interpreting results in an age group otherwise susceptible to coronary heart disease. The dilemma introduced by a false-positive result, augmented by reading a single ECG lead or arbitrary sampling in time, cautions against the needless creation of a cardiac cripple.

**RIGHT AND LEFT ATRIAL PRESURES AFTER MYOCARDIAL INFARCTION** Right atrial (CVP), pulmonary artery (PA) and pulmonary capillary wedge (PCW = left atrial) pressures were measured via a single triple-lumen balloon catheter in each of 50 subjects with acute myocardial infarction, one to 24 hours after the onset of symptoms. The catheters are constructed to allow threading into the pulmonary circulation from an antecubital vein. Chest x-rays obtained within two hours of pressure measurements were graded by a radiologist without knowledge of the patient's hemodynamic status for the presence or absence of pulmonary vascular congestion. Comparison of CVP and PCW revealed poor correlation: accurate prediction of left atrial pressure (PCW) from knowledge of the CVP of any individual patient was not possible. In fact, at PCW 18 mm Hg or higher there was a complete separation between patients with and without pulmonary vascular congestion, while the CVP measurement failed to distinguish the two groups. The authors emphasize the importance of skepticism in assessing left ventricular function from values that indicate performance of the right ventricle. Changes in left ventricular function are known to occur after myocardial infarction in man but are not necessarily reflected by pressure changes on the right. Although CVP monitoring may be considered adequate as a first approximation for fluid management during and after surgery, it is of little value in assessing true decrease in cardiac function or decrease in left ventricular compliance. (Forrester, J. S., and others: *Filling Pressures in the Right and Left Sides of the Heart in Acute Myocardial Infarction*, *New Eng. J. Med.* 285: 190-193, 1971.) **EDITOR'S COMMENT:** This article is a "must" for anyone concerned with the care of critically ill patients. Whether we like it or not, our clinical skills must include access to pressure measurements within the pulmonary circulation with disposable balloon catheters now

available commercially. The cardiology literature is replete with studies indicating dissociation of left and right ventricular function following the onset of acute heart disease, and terminology such as "myocardial depression" must be considered only slightly better than a large receptacle for our ignorance in this area. One need only consider the extensive studies that have analyzed left ventricular function following the administration of various drugs based on the assumption that measured right-sided driving pressure equals that of the left ventricle. This assumption, though permissible for the normal adult volunteer, is hardly relevant to the sick patient in need of emergency surgery. Although the balloon catheter is of value, its use has been reported to cause complications. An editorial in the same issue of the Journal addresses itself to that problem. (Gold, H. K., Leinbach, R. C., and Dunkman, W. B.: *New Eng. J. Med.* 285: 230-231 (July 22), 1971.)

**MYOCARDIAL PERFORMANCE AFTER REPERFUSARIZATION** Myocardial reperfusion by vein grafting is effective treatment for refractory angina, the principal indication for such surgery. However, improved left ventricular function may result as well. Fourteen patients were studied before and after insertion of an aorto-coronary saphenous vein graft and were divided into two groups (A and B) on the basis of postoperative graft patency determined by coronary arteriogram. Technically unsuccessful cases (group B, 6 patients) were mostly the result of graft occlusion. Preoperatively there was no statistically significant difference between hemodynamic performances of the two groups. Postoperatively, group A had decreases in end-diastolic volume, end-systolic volume, and left ventricular end-diastolic pressure, with increases in the ejection fraction and contraction velocity. Each of these trends was reversed in group B. Heart rate and left ventricular systolic pressure decreased in both groups, but not all changes were statistically significant. (Rees, C., and others: *Influence of Aortocoronary Bypass Surgery on Left Ventricular Performance*, *New Eng. J. Med.* 284: 1116-1120, 1971.) **ABSTRACTER'S COMMENT:** Objective techniques serve to assess technical

success as well as to reassure the skeptical and possibly litigation-minded patient. A substantial rate of graft occlusion should encourage a detailed investigation of causative factors in view of the rapid growth of the number of patients subjected to this operation and the resources marshalled in the process.

### CNS Function

**CEREBROVASCULAR EFFECTS OF TRAUMA** This paper represents a continuing study of the effects of trauma to the head in Rhesus monkeys and the intracerebral vascular effects of concussion. The vascular patterns were observed by serial angiography. Cerebral angiograms were obtained prior to and 15 seconds after administration of a standardized impact, and were repeated at 15, 30, and 60 minutes. The animals were sacrificed after the last angiogram and necropsies were performed.

These investigators were especially interested in the effects of trauma on the vertebral basilar circulation. They found: 1) only brief periods of apnea (2-8 sec) following trauma to the head; 2) a positive correlation between the intensity and duration of vertebral basilar arterial spasm and the extent of subarachnoid hemorrhage; 3) no arterial spasm in the absence of subarachnoid hemorrhage.

Although the etiology of arterial spasm was not defined, the authors feel that the spasm was mediated by factors released into the CSF from subarachnoid blood or directly from damage to brain tissue. They cite other evidence which suggests that visible spasm does not occur in the absence of concussion and that systemic arterial hypertension is not a likely cause of vertebral basilar arterial spasm, nor is it a consequence of posttraumatic cerebral edema. (McCullough, D., Nelson, K. M., and Ommaya, A. K.: *The Acute Effects of Experimental Head Injury on the Vertebral Basilar Circulation: Angiographic Observations*, *J. Trauma* 11: 422-428, 1971.) **ABSTRACTER'S COMMENT:** Unfortunately, measurements of cardiopulmonary function were not carried out. No study of the effects of trauma on regional blood flow can be considered adequate unless blood-gas exchange is controlled or, at the very least, monitored. To assume that the angiographic changes are due to local "toxic