

Literature Briefs

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Briefs were submitted by Drs. L. Bachman, A. Boutros, D. R. Buechel, M. Gold, J. Jacoby, F. C. McPartland, J. W. Pender, H. Roe, A. D. Sessler, S. Shnider, and H. Soetens. Briefs appearing elsewhere in this issue are part of this column.

Circulation

TRANSPPOSITION Balloon atrioseptostomy was performed in 31 infants with transposition of the great arteries. Improvement in oxygen saturation was immediate, with increases to 64 per cent from 41 per cent in the absence of a ventricular septal defect and to 74 per cent from 53 per cent in the presence of a ventricular septal defect. All 31 infants survived the procedure; 22 are long-term survivors. Advantages of this technique are: 1) no general anesthesia or sedation is required; 2) thoracotomy and cardiectomy are eliminated; 3) it can be performed rapidly in the desperately hypoxic infant too sick to withstand major definitive surgery. (Rashkind, W. J., and others: *Transposition of the Great Arteries*, *Circulation* 38: 453 (Sept.) 1968.)

MECHANICAL CARDIAC MASSAGE A substernal balloon massager connected to a cyclic pneumatic pulsator has proven useful in resuscitating patients who have sustained cardiac arrest and whose hearts have not responded within a 5-minute period to external massage. The advantages are simplicity, size, portability, and lack of trauma to the intrathoracic and abdominal organs. (Johnson, A. S., and others: *Substernal Cardiac Massage and Assistance*, *Surgery* 63: 800 (May) 1968.)

PUPIL SIZE IN CARDIAC ARREST The relation of pupil size to cardiac output produced by cardiac massage performed during cardiac arrest was determined in dogs. Following induction of anesthesia with pento-

barbitone, cardiac output was measured by dye dilution using indocyanine green. Ventricular fibrillation was then induced and maximal pupil dilation allowed to occur. Internal cardiac massage was then instituted and cardiac output and pupil size were measured. Although cardiac output during massage was only 70 per cent of the prearrest value, this provided sufficient cerebral blood flow to constrict the dilated pupil associated with cardiac arrest. (Binnion, P., and McFarland, R.: *The Relationship Between Cardiac Massage and Pupil Size in Cardiac Arrest in Dogs*, *Cardiology Res.* 3: 247 (July) 1968.)

SHOCK Survival rates may be improved by the use of hyperbaric oxygenation in dogs subjected to hemorrhagic shock. In dogs that received hyperbaric oxygen, low-molecular-weight dextran did not alter survival rates compared with survival rates in animals given dextrose in water. The improvement in survival rates was ascribed to better tissue oxygenation provided by the increased amount of physically-dissolved oxygen in plasma. The better tissue oxygenation is believed to protect cellular integrity in hemorrhagic shock and thereby prevent or minimize the emergence of irreversible shock. (Navarro, R. U., and Ferguson, C. C.: *Treatment of Experimental Hemorrhagic Shock by the Combined Use of Hyperbaric Oxygen and Low Molecular Weight Dextran*, *Surgery* 63: 775 (May) 1968.)

MORTALITY PREDICTION Forty patients (average age, 75.9 years) underwent preoperative hemodynamic studies, including determination of phasic and mean arterial and venous pressures and indicator dilution curves. Among the parameters calculated from these studies was a new variable termed "physiologic ventricular mixing volume" (V) which was derived from cardiac output, mean transi-

time and peak concentration time. Though not definable in anatomic terms, V was a reflection of ventricular volume. Overall mortality (patients dying within one month of operative procedure) was 30 per cent. Cardiac output, stroke volume, stroke work, central venous pressure, total peripheral resistance, mean transit time and anesthesia time were statistically similar in all patients. All nonsurvivors and 64 per cent of survivors exhibited some electrocardiographic abnormalities. Graphic representation of the relationship between stroke work and V showed a zone of abnormal ventricular function, which implied diminished cardiac reserve. None of eight patients in the zone of good reserve died. Regardless of stroke work, all five patients who had V values greater than 195 ml died. It is believed that this new variable is useful in predicting surgical mortality in patients without overt signs of congestive heart failure. (Gudwin, A. L., and others: *Estimation of Ventricular Mixing Volume for Prediction of Operative Mortality in the Elderly*, Ann. Surg. 168: 183 (Aug.) 1968.)

DEXTRAN AND DIABETES Several patients suffering from latent or manifest diabetes mellitus were given intravenous infusions of dextran 75 and dextran 45. These infusions did not cause any variations in the diurnal blood sugar curve and in the excretion of glucose in the urine compared with values in normal controls. Even in cases of reduced tolerance for glucose, the hydrolytic metabolism of dextrans seemed to have little quantitative importance in humans. Repeated infusions of dextran did not induce a clinically significant acitvation of dextranase. This study showed that there is no reason to restrict the administration of dextrans in patients with diabetes mellitus. (Hierholzer, G., Rehn, J., and Gatos, M.: *The Effect of Dextran Infusions on Carbohydrate Metabolism*, Langenbeck Arch. Klin. Chir. 321: 349 (Sept.) 1968.)

VENTRICULAR SEPTAL DEFECT The status of each of 58 patients (ages 3 to 57 years) with ventricular septal defect and increased pulmonary vascular resistance (PVR) was evaluated five or more years after original

diagnostic catheterization. Included in this group were patients for whom surgery had been recommended because of the elevated PVR. The probability of living five years with the disease was 95 per cent for patients 10 to 19 years old, and 50 per cent for patients over the age of 20. Hemoptysis was rare under age 20; its occurrence after 20 was a poor prognostic sign. Severity of pulmonary vascular disease was not related to the five-year survival. (Clarkson, P. M., and others: *Prognosis for Patients with Ventricular Septal Defect and Severe Pulmonary Vascular Obstructive Disease*, Circulation 38: 129 (July) 1968.)

EEG AND CARDIAC ARREST Over a ten-year period EEG studies were made of 120 children examined within the first few hours after resuscitation from cardiocirculatory arrest to establish early prognostic criteria at an electroclinical level. The EEG patterns were found to be helpful in suggesting, at a very early stage, the chances of survival and the possibility of residual cerebral damage. The best timing of the EEG studies for an early prognosis was found to be between two and 12 hours after resuscitation. The rate of EEG improvement in the first few hours after resuscitation seemed to have considerable practical prognostic value. A transitory period of isoelectric EEG is common after cerebral ischemia, anoxia, cerebral contusion, or after administration of some drugs and anesthetics. Where an isoelectric EEG existed for more than two to three hours at normothermia with satisfactory circulatory and respiratory conditions, no phasic activity ever returned in the EEG. Medically-qualified neurophysiologists responsible for EEG studies, who have had adequate experience with this type of clinical problem, should be present at the investigations and be aware of the pitfalls. (Pampiglione, G., and Harden, A.: *Resuscitation after Cardiocirculatory Arrest*, Lancet 1: 1261 (June) 1968.)

PULMONARY CIRCULATION Digoxin, ouabain and acetyl strophanthidin increased pulmonary vascular resistance in trained unanesthetized, unsedated dogs. The pulmonary artery-left atrial pressure difference in-