

Literature Briefs

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Briefs were submitted by Drs. N. Bergman, A. R. Boutros, D. R. Bucchel, R. B. Clark, M. I. Gold, W. H. Mannheimer, F. C. McPartland, D. H. Morrow, R. C. Morton, J. W. Pender, A. D. Randall, H. Roe, P. H. Sechzer, A. D. Sessler, and M. Soetens. Briefs appearing elsewhere in this issue are part of this column.

Circulation

PULMONARY HYPERTENSION After pneumonectomy, pulmonary artery pressure may rise by 30 to 40 per cent. In pneumonectomized dogs, after an exchange of 15 per cent of the blood volume by an infusion of 10 per cent dextran (mol. weight 60,000), an additional pressure rise of about 20 per cent, which lasted two hours or more, was noted. In contrast, an exchange of 15 per cent of the blood volume by a 3.5 per cent gelatin solution resulted in minimal pressure increases after pneumonectomy. The pulmonary hypertension was thought to be due to an initial hypervolemia, but gradually changed from a volume hypertension to a resistance hypertension. Hypervolemia could be excluded as a cause, as demonstrated by volumetry and typical pressure curves with high diastolic pressures. After pneumonectomy, the other lung cannot compensate by additional expansion of the capillary bed. According to Poiseuille's law, an increase in viscosity must result in an increase in resistance. The viscosity of dextran 60,000 is more than three times the viscosity of blood. In clinical practice, infusion with plasma substitutes of high viscosity should be avoided to prevent hypertension caused by increased resistance. This is important after pneumonectomy or operations which reduce the size of the lungs and lead to an increase of pressure in the pulmonary circulation. (Hartel, W., Schnelke, K., and Kohlkepp, E.: *The Effect of Plasma Vol-*

ume Expanders on the Pulmonary Artery Pressure after Pneumonectomy, Thoraxchirurgie 16: 243 (June) 1968.)

DIURETICS IN PULMONARY EDEMA

The diuretic effects of intravenous ethacrynic acid or intramuscular mercaptopmerin as an adjunct to the treatment of acute pulmonary edema were compared in two comparable groups of randomly selected patients. Although ethacrynic acid induced noticeably greater diuresis and natriuresis in the first three hours, these differences were not significant at the end of six hours. The diuretic response to mercaptopmerin was evenly distributed around a mean of 1,239 ml per six hours. In contrast, the response to ethacrynic acid was biphasic, with six patients failing to respond (mean diuresis 287 ml per six hours) and the remaining 13 voiding an average of 2,506 ml per six hours. The rate of clinical improvement was independent of the rapidity of diuresis. These data, therefore, cast doubt on the necessity for the use of the most rapidly-acting diuretics in the treatment of acute pulmonary edema. (Lesch, M., and others: *Controlled Study Comparing Ethacrynic Acid to Mercaptopmerin in the Treatment of Acute Pulmonary Edema, New Eng. J. Med.* 279: 115 (July) 1968.)

KININS AT BIRTH The concentrations of bradykinin in specimens of cord blood of 56 newborn infants at birth were about six times higher than blood levels in adult subjects. The cord arterial blood contained kininogen (inactive kinin precursor) and kallikrein (inactive kinin-releasing enzyme). At birth the temperature of umbilical arterial blood decreases. Plasma kallikrein could be activated by decreasing the temperature of infant cord blood from 37 to 27 C. Other techniques for activating plasma kallikrein were also studied.

Bradykinin, produced at birth, may be a mediator of neonatal circulatory changes, including constriction of the ductus arteriosus, dilatation of pulmonary vasculature and constriction of umbilical vessels. (Mehmon, K. L., and others: *Kinins: Possible Mediators of Neonatal Circulatory Changes in Man*, *J. Clin. Invest.* 47: 1295 (June) 1968.)

HEMOGLOBIN CATABOLISM Varying quantities of normal canine erythrocytes damaged by incubation with N-ethylmaleimide were injected into the circulatory systems of anesthetized dogs. The quantities of hemoglobin injected ranged from 0.058 to 0.552 g/kg body weight. Although 0.364 g hemoglobin/kg body weight was associated with normal sequestration, above that amount the rate of catabolism of hemoglobin to carbon monoxide reached a maximum. As a result, large quantities of hemoglobin entered the plasma. These data indicate that: (a) the maximal rate of hemoglobin catabolism in these dogs averaged about 0.07 g/kg body weight/hr; (b) hemoglobinemia can result from overloading the reticuloendothelial system with damaged sequestered cells and, therefore, may not always reflect "intravascular" hemolysis; (c) the sequestering function of the reticuloendothelial system does not appear to limit the maximal rate of hemoglobin catabolism. (Coburn, R. F., and Kanc, P. B.: *Maximal Erythrocyte and Hemoglobin Catabolism*, *J. Clin. Invest.* 47: 1435 (June) 1968.)

PHEOCHROMOCYTOMA Blood volumes in patients with pheochromocytoma, especially those with fixed hypertension, are low. Preoperatively, plasma volume and erythrocyte mass are determined. Deficits are corrected by blood transfusions and by the use of alpha- and beta-blocking agents. In patients thus prepared, no postoperative norepinephrine infusions have been necessary. Halothane is particularly suitable for anesthesia because of its depressant effect on catecholamine liberation and its ability to prevent hypertension during surgery. (Kalf, G.: *Anesthesiologic Problems in Patients with Pheochromocytoma*, *Der Anaesthetist* 17: 43 (Feb.) 1968.)

VEINS The veins have served medicine well. Their size and accessibility have made possible the development of our vast array of modern diagnostic and therapeutic methods which depend upon the simple technique of venipuncture. What are the functions of the veins? First, they act as conduits by which blood can return from the tissues to the heart. Second, they may contribute to the total peripheral vascular resistance, especially in the presence of precapillary vessel dilatation. Third, they probably play an important role in the control of fluid exchange between blood and extracellular spaces by altering the ratio between pre- and postcapillary resistance. Fourth, they almost certainly act as a blood depot, for a large quantity of blood lies in the postcapillary side of the circulation. (Brouse, N. L.: *The Veins and Cardiovascular Reflexes*, *Ann. Roy. Coll. Surg. Eng.* 42: 307 (May) 1968.)

TRANSFUSION Hypotension and homologous blood transfusion can produce periarterial hemorrhage, alveolar hemorrhage, and edema in dog lungs. These do not occur with autologous transfusion. The underlying event is pulmonary arteriolar vasoconstriction associated with periarterial hemorrhage. This is followed by a decompensatory vasodilatory phase characterized by capillary engorgement, diffuse pulmonary hemorrhage, and edema. (Verth, F. J., and others: *Pulmonary Microcirculatory Response to Shock, Transfusion, and Pump-Oxygenator Procedures*, *Surgery* 64: 95 (July) 1968.)

HEMOPHILIA Substances used for treating or preventing hemorrhage from hemophilia include fresh plasma or fresh blood, factor VIII concentrates prepared from animal plasma or concentrates of human origin such as Colin's fraction I and antihemophilic globulin. However, all of these substances have serious disadvantages. A new substance, antihemophilic cryoprecipitate, rich in factor VIII, was prepared from human plasma by cold precipitation and used to treat eight hemophiliacs on 12 occasions. Assays showed a steep rise in factor VIII activity after the infusion, and in some cases clotting function was restored to normal. The venous blood clot-