

it was used in combination with cyclopropane and ether; in 43, with cyclopropane; in 37 cases, in combination with other agents. Amounts of curare up to 200 units do not produce undesirable effects upon the baby, and the incidence and degree of fetal depression with curare-cyclopropane anesthesia have been less than with cyclopropane or ether anesthesia. There are no unusual effects on the mother. There is no increase in uterine hemorrhage. Shock is not aggravated. While curare is used routinely for the average patient undergoing cesarean section, spinal and regional anesthetics are employed where they are believed to offer a definite advantage to the patient. 1 reference.

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SIMEONE, F. A.: *Blood and Plasma in Surgical Emergencies*. Rhode Island M. J. 31: 291-298 (May) 1948.

In 1864 during the war between the States 18 ounces of blood were used compared to the 70,000 pints of blood and an equal number of units of plasma administered during one year of World War II.

In the clinical state known as "shock" there is a discrepancy between the capacity of the arterial tree and the volume of blood available to fill it effectively. There is an absolute or relative oligemia.

Greatest blood loss occurs in peripheral wounds, next thoracic wounds, and finally abdominal wounds on the average. Manifestations of shock are closely correlated with the amount of blood lost, and all, rather than a single sign or symptom, must be used in evaluating the degree.

The systolic, diastolic, and pulse pressures showed a progressive drop with increasing blood loss and are of more value than changes in the pulse.

Hyperglycemia was shown to be cor-

related both with the degree of shock and with the amount of blood lost and further proved that kidney function is depressed in relation to the degree of shock.

When blood is lost, hemodilution results from withdrawing fluid from the tissues into the circulation, while in the crush syndrome and severe burns there is hemoconcentration. Therefore, logically, in shock whole blood is preferable. After a certain amount of blood has been lost, the plasma concentration of magnesium, an intracellular cation, rises, suggesting that the intracellular compartment has been tapped for fluid, and it is logical to assume that serious functional and structural derangements of the vital organs may be produced.

Preoperative blood can be considered adequate when the blood pressure is over 80 mm. of mercury systolic, the pulse rate is dropping, the skin is warming, and circulation is returning in it. When a patient in shock fails to respond to the administration of blood, the cause will usually be found in continued hidden bleeding, continued peritoneal irritation, bronchial obstruction with atelectasis, fat embolism, clostridial myositis, and even cerebral malaria. The existence of a state of "irreversible shock" is debatable.

Plasma, although of great value, is an incomplete substitute for whole blood and should be used only when the latter is not available.

The oligemia of severe burns resulting in shock is due to plasma loss, rather than whole blood loss. The composition of fluid lost in burns approaches that of plasma except for a lower concentration of protein. Burns involving less than 10 per cent of the body surface are of little importance, but with extensive burns up to 6 liters of fluid may be lost in forty-eight hours. If the burn is less than 50 per cent of the body surface area, the vol-

ume of fluid displaced may be calculated on the basis of transfer out of the circulation of 75 cc. of plasma and 75 cc. of physiologic saline in forty-eight hours for each per cent of surface area burned. For more extensive burns, the fluid lost may be computed as 10 per cent of the body weight. Besides this loss into the extracellular space, fluid is lost from the burned surface. The former is replaced by plasma, the latter by physiologic salt solution. In addition to this replacement one must keep up the fluid requirements for normal daily physiology.

Studies show that after forty-eight hours the fluid loss is pretty well decreased. The rate of replacement should parallel the expected rate loss, so that 50 per cent is administered in 12 hours, 75 per cent by the end of twenty-four hours, 87 per cent by the end of thirty-six hours, and the total by forty-eight hours.

Fluid replacement after forty-eight hours should be only sufficient to keep the urinary output at 40 to 80 cc. per hour. In the presence of oliguria and anuria, perform the "water tolerance" test described by Cope and Moore to determine whether it is due to oligemia or renal damage.

The chronic anemia that develops is due to chronic blood loss from granulating wounds, bone marrow depression, interference with absorption or utilization of iron, and is treated by repeated whole blood transfusions.

Summary: Blood and plasma are indispensable agents in shock. Whole blood is lost in traumatic shock, and it should be used in replacement. Plasma is lost in burns and is indicated in replacement. A careful check must be kept on fluid replacement. Whole blood is needed from the chronic anemia of burns. Administration of blood and plasma is not without hazards

and must be used with great care and judgment.

Adequate graphs further help to prove the authors' points in their article. 6 references.

J. R. H.

EASON, EDITH, AND KARP, MARY: *Use of Curare in the Anesthetic Management of the Profoundly Sedated Patient*. Am. J. Surg. 75: 695-699 (May) 1948.

The purpose of this paper is to describe the use of curare in patients premedicated with large doses of morphine and scopolamine. The study is based on an evaluation of 446 cases; one hundred of these have been subjected to analysis.

The patients were premedicated in the manner described by Metz in 1936. Two and one-fourth hours before the scheduled time for surgery, the first hypodermic injection of morphine and scopolamine was given. The dosage was morphine 16 mg. and scopolamine 0.65 mg. for normal adults of good vigor. The first dose was reduced if the patient was undernourished, debilitated or over sixty years of age. The second hypodermic was given forty-five minutes later. This consisted of morphine 16 mg. and scopolamine 0.65 mg. depending on the patient's vigor. The third dose was usually morphine 10 mg. and scopolamine 0.5 mg. administered forty-five minutes after the second dose, but was omitted if the patient was unconscious and did not respond to stimulation. In all cases the anesthetist was notified before the third hypodermic injection.

Routinely a 20 unit dose of curare was given intravenously immediately before the anesthetic mask was placed on the patient's face. This caused sufficient muscular relaxation to allow a quiet induction with ethylene or nitrous oxide and permit adequate oxy-