

EDITORIAL

Preoperative Evaluation

CARLYLE in one of his essays stated, "Our duty is not to *see* what lies dimly at a distance, but to *do* what lies clearly at hand." Development of scrupulous and habitual exactness in the method of preoperative evaluation of patients is a clearly defined duty of anesthesiologists. One of his major responsibilities is early recognition of all etiologic factors which may lead to pathophysiologic reactions. The precision with which judgment can be exercised in establishing a correct diagnosis, the efficiency with which abnormalities can be corrected during operation, and the promptness with which judicious therapy can be administered in emergency depend upon our capacity to seek out and conscientiously pursue every clinical clue that can be elicited prior to performance of anesthetic procedures. Correlation of these facts with conditions that may be anticipated or may develop during periods of added stress, meticulous observation and accurate interpretation of events as they unfold during operation are equally essential duties. Anticipation of untoward events that may lie "dimly at a distance" can and frequently does lead to gratifying results when morbidity and mortality are avoided.

That it is a "full knowledge which alone disperses the mists of ignorance" is an apt quotation for anesthesiologists to heed. Sir William Osler's remarkable capacity to observe, interpret and diagnose was acquired by an active interest, sustained effort and concentration upon all phases of medicine. Avoidance of the insidious foe of complacency and self-deception with regard to the thoroughness of preoperative evaluation will prevent the anesthesiologist from being lulled into a false sense of security that carries with it more peril than the drugs he administers. It is equally true that by failing to keep abreast with medical progress and current practices he subjects himself to the pitfalls of ignorance and neglect which can assume major proportions. Untoward reactions may develop during management of anesthesia that are conceived and bred in failure to prepare the patient adequately. To cope with the complex problems introduced by modern medical and surgical therapy, anesthesiologists must continually expand their knowledge of pharmacology, physiology and pathophysiology.

Much has been written to hail the many dramatic advances resulting from the introduction and development of modern anesthesiology, modern surgery, endocrinology, the antibiotics and the availability of blood and blood fractions. Greater emphasis is warranted to remind

physicians that the scientific use of these beneficent modalities may lead to paradoxical situations. There is one which is being met with increasing frequency by anesthesiologists. The increasing use of corticotropin (ACTH), cortisone and related compounds throughout medical practice has created a hazard in relation to the practice of anesthesiology. When cortisone is given in therapeutic dosage, it blocks the effect of endogenous corticotropin and leads to atrophy of the adrenal cortex. Eventually changes in the structure of the pituitary may occur. When cortisone is withdrawn varying degrees of adrenal cortical hypofunction may continue to exist for as long as one year. This hypofunction may not become evident until the stress of anesthesia and operation is applied. Hypotension out of all proportion to blood loss may occur during performance of a minor or major procedure. Worse still, the syndrome of shock may be delayed in its appearance until eight to ten hours have elapsed following operation. In the interval, those responsible for care of the postoperative patient may be unaware of the insecure position in which the patient is placed. Patients operated upon in the morning may develop their alarming symptoms of hypotension at night when nursing care is entrusted to a reduced force. To avoid this situation preoperative evaluation should bring to light the fact that a patient has in the past received ACTH, cortisone or allied steroids. If their administration has been discontinued preoperative medication should include intramuscular administration of the steroid originally employed and the anesthesiologist should be prepared to administer hydrocortisone intravenously should hypotension out of proportion to blood loss occur during operation or after.

A recent review of 5,463 patients treated in a recovery room revealed that 180 developed hypotension. More important than the types of patients who became hypotensive were the underlying factors producing the syndrome. The patients were classified into six groups according to the etiological factors involved, that is, hypotension of: (1) cardiovascular origin, (2) respiratory origin, (3) pharmacological origin, (4) neurogenic origin, (5) hematological origin, and (6) humoral origin. Admittedly, combinations of these etiological factors may frequently coexist to produce respiratory and circulatory insufficiency. However, such a classification provides a framework upon which to construct the important clues which must be appreciated to achieve a prompt diagnosis and to treat postoperative hypotension intelligently. Awareness of the preoperative status of patients whose hypotension was of cardiovascular, hematological and humoral origin had a direct bearing on their treatment. Onset of cardiac failure or myocardial infarction during or immediately following operation can be more precisely and, therefore, more effectively treated if replacement therapy is administered according to specifically known qualitative and quantitative needs. Because clinical impressions are too fre-

quently unrealistic and unscientific they do not suffice. Studies of blood volume are reliable guides. They have provided valuable information for planning replacement therapy. At the same time it has been possible to avoid circulatory overload. This is especially important among patients with coronary disease or cardiac failure. With data regarding blood volume known, when hypotension occurs treatment directed toward restoration of efficient circulation can be regulated effectively. The hazards of concealed anemia or circulatory overload can be avoided. In the presence of compensated anemia the clues are provided that specific amounts of packed red blood cells are indicated rather than transfusions of whole blood. The deceptive presence of chronic uncompensated anemia that frequently accompanies chronic infection, malnutrition and malignant disease, especially carcinoma of the gastrointestinal tract, is readily detected. Replenishment of significant deficits of whole blood that may exist improves the tolerance of patients to major operative procedures. In the presence of circulatory insufficiency due to myocardial infarction, peritonitis, bacteremia and adrenal dysfunction studies of blood volume frequently provide the clue that causes, other than abnormalities of blood volume, must be sought to account for the onset of shock.

It is worthy of note that 38.7 per cent of the general surgical patients, 44.6 per cent of the gynecological patients and 80.0 per cent of the orthopedic patients who developed hypotension in the recovery room required further transfusions. This implies that many of these patients came to the operating room without having an established baseline upon which to guide intelligent replenishment or replacement of deficits of blood volume. A definite parallelism exists between the inadequacy of preoperative preparation and the onset of untoward effects of anesthetic and operative procedures. The majority of patients with fractures of the hip are in the geriatric group. Their fractures are frequently the result of injuries caused by pre-existing infirmities such as malnutrition, anemia, major disturbances of the cardiovascular or central nervous systems that produce dizziness, faintness and collapse. In addition, as much as 1,500 cc. of blood may be present in the tissues of the hip and thigh without outward evidence of its presence. Studies of blood volume performed upon 111 geriatric patients with fractured hips revealed that 46.0 per cent had deficits in volume of plasma amounting to 300 to 2,000 cc., 72.0 per cent had deficits of red cells amounting to 300 to 2,000 cc., 66.0 per cent had deficits of total blood volume amounting to 300 to 2,000 cc., and 45.0 per cent had significant deficits of plasma protein.

The presence of unrecognized hemoconcentration or hypervolemia, or both, may lead to onset of serious complications during the operative or postoperative period. Increased viscosity, retardation of circulation and intravascular coagulation caused by hemoconcentration or polycythemia may precipitate development of myocardial insufficiency,

coronary thrombosis, cerebral thrombosis, and other thrombotic phenomena. Vascular congestion caused by hypervolemia leads to increased bleeding, may lead to formation of hematoma and the production of pulmonary and cerebral edema. When hemoconcentration and hypervolemia coexist performance of repeated phlebotomies is indicated prior to elective procedures. In emergency, regional anesthesia should be employed whenever possible.

Except in emergency, operative procedures for patients with disturbances of endocrine function, electrolyte imbalance, hepatic insufficiency or renal insufficiency should be undertaken only after every known measure to correct or improve the patient's status has been applied. Management of hypertensive patients must include therapy directed at maintenance of optimal levels of blood pressure to assure adequate glomerular filtration and efficient circulation to the myocardium and brain. Systolic pressures of 140 to 150 mm. of mercury may constitute hypotension for patients with marked hypertension. This fact assumes increasing significance in the safe conduct of anesthesia for performance of surgery involving major vessels, the heart and brain. The advantages gained from employment of hypotensive techniques or hypothermia may be nullified unless their use is preceded by a series of tests that are informative of each patient's true status. Strict adherence to the contraindications of these methods is possible only where clinical impressions are supported by confirmatory evidence.

To make Carlyle's statement truly applicable to the practice of anesthesiology it might well read, "Our duty is not 'only to anticipate and' to see what lies dimly at a distance, but 'also' to do 'with zeal' what lies clearly at hand."

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