

sult. Phenobarbital was used in one instance, but it is too slow in its action to deserve a place in preoperative medication.

"Tribromethyl alcohol was given as the basal narcosis to four patients in this group, of whom three died. One died from tracheal edema some eighteen hours after operation, the other two from thyroid crisis. Lack of adequate nursing care in our institutions has led us to discourage the use of tribromethyl alcohol. In other circumstances it might be found more satisfactory.

"It is our opinion that atropine has no place in the premedication of the thyroid patient because it is a powerful metabolic stimulant and has no amnesic effect. . . .

"Practically all our cases exhibited an increase in the blood pressure and pulse rate while the glands were being manipulated. The relationship of the hypertension occurring during anesthesia to the postoperative course is not at all clear. Some of the patients, having the greatest increase in pressure, made the best recoveries. We can show no statistical evidence of superiority for the combination of a barbiturate, morphine and scopolamine over morphine and scopolamine as far as complications occurring during the anesthesia are concerned. The patients exhibiting the greatest disturbance during anesthesia were most heavily premedicated. One should, of course, avoid too much preoperative sedation. . . .

"The incidence of cough was approximately 10 per cent. greater with the cyclopropane group than with the nitrous oxide-local group. Our statistics show that we have about 4 per cent. higher incidence of postoperative pharyngitis with cyclopropane than with nitrous oxide. The incidence of tracheitis was about 10 per cent. higher in the nitrous oxide group. Tachycardia was 10 per cent. more frequent

after cyclopropane. Thyroid crisis occurred only in the cyclopropane group. Urinary retention and albumin were 3 per cent. more frequent after cyclopropane, and in the same group white blood cells in the urine occurred 7 per cent. more frequently. There were no casts in the urine after nitrous oxide. The incidence of fever of 99° or more was 17 per cent. greater after cyclopropane. . . .

"By combining local infiltration of the operative field with the nitrous oxide-oxygen anesthesia, it is possible to administer a higher percentage of oxygen than will be the case if no procaine is used. In a few of our cases with severe myocardial degeneration, we have depended mainly on the local anesthesia, and have given only enough nitrous oxide to control the patient's restlessness. . . .

"Ordinarily we feel that ether has but little place in thyroid anesthesia, provided the gases are available. However, we believe that a light ether anesthesia offers the greatest degree of safety for those few patients having severe myocardial degeneration combined with uncontrollable fibrillation. . . . Our experience with ethylene has been too limited to warrant its inclusion in this comparative study."

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BEHREND, A., AND RIGGS, H.: *Cerebral Complications Following Surgical Operations. II. Factors Which Predispose to Cerebral Anoxia.* Arch. Surg. 41: 772-780 (Sept.) 1940.

A former article dealt with the etiologic, pathogenic, and pathologic aspects of the cerebral complications of surgical operation. Twenty-one cases of fatal cerebral complications were reported. However, such complications are not always fatal and many more patients recover than die. Using cases in which careful postmortem examination was made, it was demonstrated

that most types of postoperative cerebral complications may occur as a result of cerebral anoxia. This anoxia is said to be secondary to acute general circulatory collapse precipitated by anesthesia plus surgery.

On the basis of the physiologic concept of the types of anoxia, it is evident that anoxia plays a role in many medical and surgical conditions.

Organic Heart Disease.—The cells of the brain are the most highly differentiated of the body and require more oxygen; thus any pathologic process affecting the heart or blood vessels which results in a reduction of adequate blood supply to the cerebrum may contribute to the production of cerebral complications.

Anemias.—Severe anemias, either chronic or acute, predispose to cerebral accidents. The anemia, plus the anesthesia and operation, often leads to tissue asphyxia.

Anatomic Factors.—These are probably rare, though individual variations in the pattern of the cerebral vessels are seen and one-half of the brain may have a poorer blood supply; in such a case the degree of cellular damage would be greater on the deficient side.

Age.—Postoperative psychosis is rather common and may be based upon the loss of elasticity and slowing of the cerebral circulation. However, due to a lower basal metabolic rate, old people do not suffer from relative lack of oxygen as soon as younger people.

Metabolic Disorders.—Hypertthyroidism with the so-called "thyroid heart" and "thyroid crisis," and "liver death" following cholecystectomy are examples of disorders in which blood supply to the cerebrum may be altered.

Surgical Emergencies.—Here we find shock, hemorrhage, and overwhelming infections, such as peritonitis. In shock and hemorrhage, the result is tissue anoxemia.

Anesthesia.—In the hands of most anesthetists ether probably remains the safest general anesthetic, yet it is not without dangers. With high ether concentrations, there may be a lack of oxygen. With nitrous oxide, the great danger is that of tissue anoxia during prolonged operations. The gas itself produces no direct effect either on the heart or medullary centers. Ethylene and cyclopropane can be used with a sufficient supply of oxygen even though they are inflammable. Furthermore, cyclopropane may be definitely toxic to the myocardium, and the respirations are easily depressed by the agent.

Avertin with amylene hydrate is a circulatory and respiratory depressant and anoxia is common unless supplementary oxygen is administered.

Spinal anesthesia is becoming more popular for general abdominal procedures but here, too, the dangers of tissue anoxia are present if the anesthesia is too high or if the blood pressure drops markedly.

Tragic accidents have occurred as a result of faulty apparatus and all gas apparatus should be examined at regular intervals by a qualified expert.

Nutritional Deficiencies.—Vitamin deficiencies are known to alter the integrity of the myocardium and capillaries and the effect of deficiency may show itself in the postoperative field.

In conclusion, it has been shown that many factors enter into the problem of postoperative cerebral complications.

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