

anesthesiology

Gathered at the meeting of the American Society of Anesthesiologists in Washington, D. C.

PREGNANCY

Anesthetics affect the unborn

Anesthesiologists, using standard drugs but new techniques, are learning about the effects of anesthesia on the fetus, and on the placenta which serves as its lungs, kidney, liver and intestines before birth.

To determine the effect of anesthetic drugs on blood flow to the womb, Dr. John J. Bonica of the University of Washington, Seattle, placed catheters into the veins and arteries of pregnant rhesus monkeys and into the leg arteries of their unborn infants to record arterial pressure and heart rate.

Two minutes after one anesthetic, pentobarbital, is given, the mother's blood pressure and blood flow to the uterus drop significantly, he reports. However, this does not occur when anesthesia is induced by use of several drugs in combination.

Testing the action of commonly used local anesthetics injected directly into tissue on either side of the womb, Dr. Sol M. Shnider finds that while this form of anesthesia may be satisfactory to the mother, it may cause an abnormally low heartbeat in the fetus. High, possibly toxic, concentrations of drugs were also found in the fetus in Dr. Shnider's studies at the University of California Medical Center, San Francisco. The current assumption that local anesthetics are ideal for women in labor needs review, he says.

NEUROPHYSIOLOGY

Truth serum spots brain lesions

Small doses of thiopental, long used as a truth serum, are being used to pinpoint areas of diseased brain tissue responsible for epileptic seizures.

By exact localization of the diseased area, surgeons are able sometimes to remove it, relieving seizures. In the past, this has been possible only in patients undergoing brain surgery with a local anesthetic.

Dr. Mary A. B. Brazier of the Brain Research Institute of the University of California at Los Angeles finds that the shock and damage of such surgery can be avoided by identifying the diseased brain tissue in advance. Slow administration of thiopental evokes specific brain wave patterns that can be used as markers, she reports. Convulsive seizures indicate the presence of overactive brain cells, or neurons, that fire irregularly. Thiopental apparently triggers these electrically disturbed cells so that their activity can be picked up by an electroencephalograph.

INFECTION

Halothane reduces antibody production

One of the most commonly used anesthetics, halothane, has a tendency to reduce the quantity of antibodies produced by the body. This may at least partially account for the fact that patients have a low resistance to infection following surgery, report Drs. Daniel W. Wingard

and Loren J. Humphrey of the University of Kentucky Medical Center in Lexington.

Evidence comes from experiments on rats exposed to halothane. At various intervals after anesthesia, the researchers sacrificed the rats and measured the number of antibody-producing cells in their spleens. The greatest depression occurs within the first hour or two.

"The significance of this finding has not been determined," Dr. Wingard says, but he suggests that it may affect the spread of cancer cells as well as antibody production, because antibody-producing white blood cells may be important in the control of cancer cells.

The researchers are not sure why antibody levels fall after halothane anesthesia, but postulate a toxic effect on bone marrow—site of blood cell manufacture.

CELL DIVISION

DNA production slowed

Halothane, a sweet-smelling anesthetic that creates a pain-free state rapidly and smoothly, also prolongs the process of cell division by slowing the synthesis of DNA (deoxyribonucleic acid).

Dr. David L. Bruce and co-workers at Northwestern University Medical School, Chicago, gave rats radioactive thymidine (one of the basic components of DNA) and exposed them to halothane for times ranging from 10 minutes to 24 hours. In control animals, DNA synthesis in bowel cells took 6.1 hours. In animals exposed to 0.1 percent halothane in air, synthesis took 7.9 hours and in those exposed to 0.5 percent of the anesthetic, synthesis required 10.2 hours.

The inhibitory effects of halothane appear to apply only to the DNA synthetic phase and do not alter the process of cell mitosis or splitting, except to slow the entire cell cycle. "Whether or not this matters to patients undergoing surgical anesthesia is not known, but appears unlikely," Dr. Bruce observes.

DOSAGE

Alcoholics require more anesthetics

Anesthesiologists have a hard time putting alcoholics to sleep. They may need twice as much anesthesia as normal individuals.

The reason, Dr. Yong T. Han of St. Vincent's Hospital and Medical Center, New York, believes, may be that in some alcoholics myelin, or nerve coating, is destroyed. Autopsies of brain tissue of alcoholics show that about 30 percent have some loss of myelin in the white matter of the brain. Associated with this is an increase in fat and phosphorous in the central nervous system. These factors affect the brain's absorption of anesthetic drugs.

Whether the myelin destruction is caused by alcohol is unknown. Likewise, researchers do not know whether the large doses of anesthetics given to alcoholics undergoing surgery have bad effects on heart muscle, liver and other tissues that come in contact with the drugs before they reach the brain to produce unconsciousness.