New therapy blocks newborn jaundice

A novel technique for managing jaundice in newborn infants is proving successful in clinical trials, researchers report. The experimental procedure, which involves injecting a synthetic blood protein into affected babies soon after birth, may greatly simplify treatment of one of the most frequent and troubling complications to occur during an infant's first few days of life.

Newborn jaundice is the result of an abnormal accumulation of bilirubin, a yellow pigment that is one of the breakdown products of hemoglobin, the oxygen-carrying component of blood. It occurs when unusually large amounts of a newborn's red blood cells are destroyed, such as when the newborn's blood type is incompatible with its mother's. It also occurs frequently in normal premature infants, and in some full-term babies, because the immature liver is incapable of clearing even normal levels of bilirubin from the blood. If not treated promptly, newborn jaundice, or hyperbilirubinemia, can result in permanent brain damage.

Currently, therapy involves keeping the infant for several days in a special chamber bathed in ultraviolet light, which speeds the breakdown of bilirubin into harmless by-products. More severe cases require blood transfusions. But these therapies are less than ideal. Light chambers can cause dehydration, interfere with digestion and require that the baby be separated from the mother during the first few days of life; blood transfusions are even more traumatic.

Now researchers report they can halt bilirubin formation *before* levels get high enough to require such treatments.

Working under the direction of Attallah Kappas, physician-in-chief at Rockefeller University Hospital in New York City, a research team designed a synthetic protein, called Sn-protoporphyrin, that mimics hemoglobin in the blood but that contains tin instead of iron as its central metal atom. The pseudo-hemoglobin binds to the enzyme that normally converts hemoglobin to bilirubin, preventing real hemoglobin from interacting with the enzyme. Thus hemoglobin is excreted without ever getting converted to bilirubin.

"This is the first approach that tries to deal with the formation of bilirubin rather than trying to remove the formed product," says George Drummond, one of the researchers. "The beauty is that we're using a synthetic compound that is later excreted in the bile, and the amounts you have to give are very, very small."

After years of studies on animals and on adults suffering jaundice due to liver disease, the researchers recently treated 53 newborn, full-term infants with jaundice due to blood-group incompatibility. Those trials, performed in Greece and reported in the April PEDIATRICS, reduced bilirubin levels by as much as 34 percent and cut the need for ultraviolet therapy more than 40 percent.

The only side effects reported were transient redness of the skin in two infants who received the bilirubin enzyme inhibitor and light treatment concurrently. The researchers say those effects may be eliminated by changing slightly the wavelengths of ultraviolet light used in those cases.

"Pediatricians have long dreamed of the day when the bilirubin problem would be solved and they would be free of the constant worry about 'what to do for a certain level of serum bilirubin,'" says Jerold F. Lucey, editor of PEDIATRICS, in a commentary accompanying the research report. The new treatment, which he calls an important "first step" toward fulfilling that dream, ". . . represents a promising and new approach to the prevention of neonatal hyperbilirubinemia." —*R. Weiss*

Jump for joy: Blue frog babies

George Grall

Blue poison arrow frog: No longer blue about no babies.

After five years of experimenting to create the perfect amorous atmosphere for their blue poison arrow frogs, scientists at the National Aquarium in Baltimore have something to celebrate: six newly metamorphosed blue frogs, the first bred in the United States. A rainbow of other-colored poison arrow frogs — 50 black-and-green, 20 orange-striped and 21 yellow — also were successfully hatched and metamorphosed from tadpoles between July 1987 and February 1988. And two other species are in the tadpole stage.

The poison arrow frog family was recently given "threatened" status by the Convention on the International Trade of Endangered Species, which regulates the export and import of animals. The frogs' already limited habitat — from Nicaragua to Bolivia and Brazil — is being destroyed as rain forests are cleared for agriculture and ranching. Blue poison arrow frogs inhabit an even smaller area, living in isolated "forest islands" in the savanna of southern Surinam, near the Brazil border. This region is not currently threatened, but scientists want to learn about the frogs' breeding as a hedge against future threats to their existence in the wild.

"One of the biggest reasons we have [for breeding the frogs] is to show the public that other living things besides just trees are going to be lost in rain forests when they're cleared," says herpetologist Jack Cover at the National Aquarium.

The aquarium's blue poison arrow frogs had produced eggs before, Cover says, but none had ever been fertilized. The researchers discovered the frogs prefer to live in pairs rather than in large groups and they require the privacy and security of a relatively small nest to lay and fertilize their eggs. Taking cues partly from European breeders, Cover and his colleagues made "breeding huts" out of the upside-down bottoms of 2-liter soda bottles, cutting a small door in each.

A more varied diet enriched in vitamins and minerals and an increase in humidity to simulate the rainy season also may have helped put the frogs in a steamy state of mind. — *S. Weisburd*

Hold the CFCs

Companies that produce disposable foam products used in food service — such as cups, plates and fast-food containers — announced this week they will voluntarily stop using fully halogenated chlorofluorocarbons (CFCs) — the class of chemicals most destructive of the atmospheric ozone layer. The manufacturers will complete the phaseout by the end of 1988, according to the Foodservice and Packaging Institute, Inc., a Washington, D.C.-based alliance of manufacturers. Almost a third of the foam products used in food service contain either CFC 11 or CFC 12, chemicals that blow bubbles into foam and provide insulation. A recent international treaty set future limits on the use of these chemicals.

Many manufacturers of disposable foam now plan to switch to HCFC 22, a substitute that is 20 times less destructive to ozone (SN: 4/9/88, p.234). □