

MEDICINE

Clue to Baby Deformities

Hatching baby chicks, deformed because of previous insulin injections into the yolk, may help doctors find a dietary way to prevent congenital deformities in babies.

► CHICKENS hatching out with deformities of the skeleton, such as parrot beaks and dislocated hips, may help doctors find a dietary way to prevent congenital deformities in babies.

The baby chicks were born deformed because insulin was injected into the yolk of the eggs from which the chicks hatched.

Current theories about inheritance of deformities may also need to be revised because some offspring of the insulin-deformed chicks are born deformed. Heretofore scientists have held that if a baby was born with a clubfoot, the prebirth damage was to the foot and not the genes, the carriers of heredity. It was assumed that the damage would not be carried to the next generation.

The discovery that pre-hatching doses of insulin could cause congenital deformities in chickens was made by an orthopedic surgeon of India, Dr. P. K. Duraiswami, who is now visiting in this country. The chicken experiments were carried out at the University of Liverpool, England.

The insulin-caused deformities in the chickens are similar to many common congenital deformities of bones and joints seen in children. Some of the chickens have claws turned inward like clubfeet in humans. Some are born with dislocated hips. Others have deformities of the spinal column such as the spina bifida seen in humans.

Large doses of insulin on the third to sixth day of incubation cause generalized disturbance of bone development in the chicks like the condition in humans known as osteogenesis imperfecta, or brittle bones. The bones are so fragile they break even with such slight force as the movements of the embryo.

Some chicks hatch out with both knees dislocated, or with breaks at the lower third of the tibia, or shin bone. This, Dr. Duraiswami points out, is the favorite site for pseudoarthrosis, a kind of false joint condition in children. Some chicks have curved beaks like parrots. Others have short, crossed-over beaks.

Besides the bone and joint deformities, the chicks hatch with either no eyes, very small eyes or enlarged eyes swollen as if by dropsy. All of the insulin-chicks are smaller and more delicate than normal chicks and have to be reared with great care.

The kind of deformity produced depends on the amount of insulin injected and the day of incubation when it is injected. Doses of insulin used ranged be-

tween five-hundredths of a unit and six units. The injections were made very carefully into the yolk, without touching or damaging the chick embryo in any way. On or after the twelfth day of incubation, no amount of insulin produces any deformity in the chickens.

Reason for the deformities, Dr. Duraiswami thinks, is that bones and joints and eye tissues during pre-birth formation re-

MEDICINE

Chemical Tests with Blood

► THE RED cells of human blood can double as chemical testing materials, Dr. M. H. Jacobs of the University of Pennsylvania reported at the meeting of the National Academy of Sciences in Washington, D. C.

As little as one-hundredth of a grain (one milligram) of copper can be detected in a barrel of solution because of the effect of glycerol on red blood cells, Dr. Jacobs said. The glycerol affects the permeability of the cells and is highly specific.

An impurity in so-called chemically pure salt (sodium chloride) was discovered be-

quire a sugary protein substance. The insulin injections apparently cause sugar to be burned so fast there is not enough of it circulating in the embryo's blood to supply these tissues.

Fitting in with the evidence from the chicks of the importance of proper sugar and starch utilization during embryonic life are statistics from humans. These show that 6.3% of children of diabetic women are born with deformities. The rate for children of normal women is 0.94%.

The insulin-caused deformities in the chicks can be prevented by giving, along with the insulin, injections of B complex vitamins, especially riboflavin. This fits with work of American scientists who caused congenital deformities in rats by depriving the mother rats of riboflavin during pregnancy.

Science News Letter, April 28, 1951

cause of its effect on the red cells of certain fish. The impurity, discovered by another scientist to be silver, caused the red cells to lose their hemoglobin.

Changes of shape of the red cell, Dr. Jacobs reported, affect the optical properties of its suspensions. This can be seen with the naked eye and can be photographed.

Tannic acid at very high dilutions changes the red blood cell's permeability to negatively charged particles. This can be used to determine indirectly minute amounts of substances such as proteins and organic bases with which tannic acid combines.

Science News Letter, April 28, 1951



MEDICAL TEAMS—Civilian battle casualty, a South Korean woman, is given plasma by a U. S. Navy corpsman, in preparation for leaving by jeep for an aid station.