news THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT DALLAS
southwestern medical school ▪ graduate school of biomedical sciences ▪ school of allied health sciences

September 27, 1974 Contact: Bob Fenley

******Although grafting of replacement organs and cells is usually regarded as an artificial process, there are situations where transplantation occurs naturally. The most familiar example is the implanting of the fertilized egg in the uterus--the prelude for development of a fetus as a sort of tolerated alien graft. Another form of natural transplantation is being explored by Dallas researchers. This is the transfer of living white blood cells by mothers' milk in a process which may supply the nursing young with important immunologic benefits.*

DALLAS--New evidence is emerging that breast milk contains millions of white blood cells which transmit immunity against certain early childhood diseases and protects the infant in a variety of other ways.

In an article in a recent issue of the Journal of Investigative Dermatology, Drs. Alan E. Beer, Rupert Billingham and Judith Head of The University of Texas Southwestern Medical School, report that experiments conducted in rats show that mothers' milk contains lymphocytes which they believe are incorporated into intestinal tract and tissues. Here, the short-lived quota of reactive cells provides an immunological defense based on the mothers' prior experiences with disease.

-- more --

5323 HARRY HINES BLVD. ■ DALLAS, TEXAS 75235 ■ TEL. (214) 631-3220, EXT. 404

One possible protective role which milk-transmitted white blood cells may play in human infants is under current investigation. A significant toll of human babies is taken each year by a disease known as necrotizing enterocolitis. This is, in part, due to an intestinal infection which is associated with a breakdown of the lining of the gut. Subsequent generalized infection usually results in death.

Factors which may predispose toward the disease singly or in combination are prematurity, varying periods of respiratory difficulty with oxygen deprivation, early feeding of prepared formulae or an exchange blood transfusion performed early in life.

Scientists at Columbia Presbyterian Hospital in New York have created a faithful laboratory model of this disease in new-born laboratory rodents by simply formula feeding, and withholding breast milk.

"The presence of the viable white blood cells in milk appears to be essential for complete protection from this often-fatal disease of the very young," commented Dr. Beer. "These white blood cells also appear to equip the infant with short-lived mature reactive maternal immunity capable of defending the infant recipient from a variety of invading pathogens, until its own immunologic defense machinery gets into full gear."

The Dallas scientists became interested in breast feeding as a mechanism of immunology when they noticed what was happening to suckling rats involved in skin graft experiments.

"We had been doing grafts where we took the infant's skin and placed it on the mother," said Dr. Beer.

"A significant portion of the sucklings developed dermatitis about the same time that the mother was rejecting the skin graft," he said.

This indicated that the cells which were being programmed by the mother's body to resist the skin graft also were being passed through the mother's milk to the infant.

Drs. Beer, Billingham and Head presented their findings on breast feeding at the Fifth International Congress of the Transplantation Society in Jerusalem in August.

At the meeting Dr. Billingham assumed the presidency of the society, succeeding Sir Michael Woodruff, a well-known British surgeon and authority on tissue and organ transplantation.

In explaining the transference of immunity, Dr. Beer said:

"The breast during lactation is doing the function which the placenta found too dangerous to perform." Some immunity is, in fact, passed to the human infant through the placenta prior to birth. The Dallas scientists say recognition that mothers' milk conferred protection is "almost as old as immunology itself." And clinical experiments have backed this up. But exact mechanisms have not been understood.

The Dallas group believes that breast feeding is valuable in a number of other ways, such as obviating the need for cows' milk, which they believe may be implicated in the "Sudden Infant (or Crib) Death Syndrome."

One popular theory about SIDS is that it may result from an allergenic reaction to cows' milk. It's suggested that the baby becomes sensitized to cows' milk through drinking it in formula--then through burping or vomiting introduces some of the milk into the trachea. This introduced milk then sets off a fatal reaction somewhat like a wasp sting does in highly sensitized persons.

Other scientists disagree with this theory--some subscribing to the idea that crib death results from a neurological cause. "It is of great interest that the sudden SIDS has not been reported in a solely breast fed infant," said Dr. Beer.

"In view of the circumstantial evidence sustaining the hypothesis that crib death is caused by anaphylactic (sensitivity type) reactivity to cows' milk, it is surprising that it has not gained wider acceptance," wrote the Dallas scientists.

The Dallas researchers have done an extensive series of experiments with rats which show that changes in immunologic reaction of the infants can be caused by feeding some mothers' milk white blood cells and withholding it from others.

##