News
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******Burn expert believes laboratory discoveries hold key to burn advances.

DALLAS--A pioneer in the treatment of major burn injuries believes that many of the future improvements in this important area of medicine will come from the laboratory.

Over the last 20 years, Dr. Charles R. Baxter, professor of surgery at The University of Texas Health Science Center at Dallas and head of the Parkland Memorial Hospital Burn Unit, and his staff have been responsible for such innovations in burn care as better treatment of burn shock and new approaches to nutrition. Today patients at Parkland routinely are seen by a team of reconstructive surgeons, physical and occupational therapists, psychologists and social workers, in a team approach for the good of the patient. Now a new program of coordinated research is bringing together the clinician and the biochemist in a search for new answers to better care for the patient with thermal injuries.

While the burn team is making major advances in treatment, Baxter still looks to future improvements as a result of research on the patient's abnormal metabolism and immune system. Baxter says that if breakthroughs can be made in these areas, we can really change the outcomes of major burns.

Biochemists Dr. Larry Cottam and Dr. Richard Harris are focusing on the altered lipid metabolism, associated with the abnormally short life of the red blood cells. In the burn patient these cells live only about one-third as long as normal red blood cells. This abberation results in the severe anemia routinely seen after extensive burn injury which lasts more than two months and results in many blood transfusions.

Although these patients have an extremely high ratio of free fatty acids to albumin in their plasma, they have a deficiency in the essential dietary fatty acids so essential to wound healing. There is also a deficiency of high density lipoproteins important in cholesterol metabolism. The reason for this paradox is not completely understood, but it is known that this imbalance causes severe problems for the patient. While the scientists are looking into the causes for these excesses and deficiencies, they are also working toward a variety of possible nutritional therapies leading to the correction of these lipid abnormalities.

One approach being studied is the administration of carnitine, a protein usually obtained by eating meat in a normal diet. Carnitine is important for maintaining a normal fatty-acid metabolism.

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Another nutritional deviciency being investigated by Cottam and Harris is the low content of fat-soluble vitamins in the burn patient. A proper concentration of these vitamins, while essential to everyone, is especially important to the burn victim. Vitamin A plays a big role in the healing of wounds, while Vitamin E is an important anti-oxidant which also acts in conjunction with the polyunsaturated fatty acids in maintaining a proper nutritional balance in the body. Also, Vitamin K is an important element in blood-clotting activity, a function vital to the burn victim whose loss of plasma from the cells is a major problem. Studies are going on to monitor the level of these vitamins in burned patients in order to adequately supplement them in the patient's diet.

These biochemists are now looking at the possibility of adding safflower oil in addition to other fats already being used in intravenous feedings. Feedings by tube are essential to supplement the high-calorie diets burn patients must eat to try to keep up with their escalated metabolism. For example, it may be necessary for an active adult male to consume as many as 8,000 calories a day in order to compensate for this caloric loss.

Equally important to the metabolic studies are the white-cell studies also going on in the Department of Biochemistry. Dr. Michio Nakamura, leukocyte expert from Japan, was brought to the health science center by Dr. Bettie Sue Masters to do research in this area. Working with Baxter, Masters and their staffs on a joint research grant, Dr. Richard Okita and Nakamura are looking for answers to what goes wrong with the immunity system when there is burn trauma. These researchers also feel that evidence points to the patient's own plasma, as is the case with the red-cell studies. Also, we now know that the cells themselves are defective.

The burn patient, Masters explains, requires unbelieveable amounts of antibiotics to fight infection. If the leukocytes, the foot soldiers of the immune system, don't mount a strong enough attack, the next line of defense is the lymphocytes, which are responsible for the production of antibodies. Often they, too, are inadequate to the challenge.

"This is an unknown area," Masters explains. "We don't know if the patients are getting the mobilization of leukocytes they need or if the wound is just too massive for them to handle. Perhaps the problem lies in the burn patient's attracting mechanism that is supposed to sound the alarm and summon the leukocytes to the wound. What we want to do is mount the invasion rather than give large doses of antibiotics. That's why we're looking at all the lines of defense."

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