

Cancer phototherapy: Illuminating blood

Blood cell cancers can be particularly tricky to treat. Unlike solid tumors, they are not candidates for surgery—you can't permanently remove someone's blood. Now, a New York researcher has devised a novel approach called extracorporeal photopheresis, which involves treating blood outside the body with a drug activated by light.

The developers hope the procedure will also be useful in autoimmune diseases, in which the immune system attacks the body. Initial evaluation for safety and efficacy has just begun at six U.S. and European institutions. Columbia University's Richard Edelson, who designed the technique, described it at last week's American Cancer Society seminar in San Diego.

In the past three years, Edelson and his colleagues have treated 11 patients suffering from cutaneous T cell lymphoma. In this type of cancer, which Edelson says has a median survival rate of about three to five years, the body produces too many T cells, white blood cells that are part of the immune system.

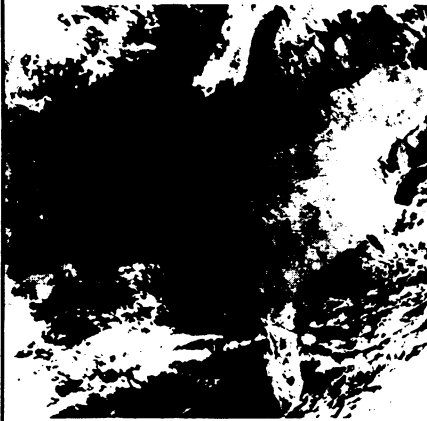
The patients were given psoralen, a drug activated by ultraviolet light and currently used to treat psoriasis (SN: 5/22/82, p. 346). Since ultraviolet light is absorbed by the skin, the problem is getting it to the blood-borne psoralen where it is needed. Edelson and his colleagues remove some blood from the patient, separate out a solution of mostly white blood cells and return the rest to the body. Before they reinfuse the white blood cell fraction, they expose it to ultraviolet light, which activates the psoralen for a few thousandths of a second. The activated psoralen disrupts the white blood cells by causing extensive crosslinking of the DNA.

Eight of the 11 patients treated thus far have shown a decrease in T cells; two of them have been taken off therapy and have not suffered a recurrence. The disease treatment, notes Edelson, is not a cure—it eliminates some of the extra cells, but it doesn't halt their production. Many other diseases involve T cells, and, he says, "what we are really after is the treatment of immune diseases."

Bruce Wintroub, who is conducting a trial of extracorporeal photopheresis at the Veterans Administration Medical Center in San Francisco, says finding photoactive drugs that will work against specific types of blood cells involved in different types of diseases is key to extending the therapy's uses. "The more specific you can make the chemical you're going to activate," he says, "the more specific you can make the treatment."

Edelson is awaiting Food and Drug Administration approval to use the ultraviolet light device on patients with autoimmune diseases. —J. Silberner

Twenty-five years of weather satellites



Photos: RCA

This month marks the silver anniversary of weather watching from satellites. On the right, in the insert, is TIROS-1 (Television Infrared Observation Satellite), a 260-pound, polar-orbiting satellite that sent back the first weather picture from space (also shown at right) on April 1, 1960. Before satellites, weather observations were unavailable for more than 80 percent of the planet. Today, a fleet of geostationary (hovering at a fixed point above the equator) and polar-orbiting (traveling from pole to pole) satellites—including a more recent, 2,288-pound TIROS, which sent back the picture at left—provides not only an almost continuous view of weather patterns all over the globe, but also a flood of other data including vegetation cover on land, oceanic and atmospheric temperatures and particle activity surrounding the earth.

Kudos for clot buster

A bioengineered protein may be almost twice as effective as the drug currently used to dissolve heart-attack-causing blood clots lodged in coronary arteries, according to preliminary results of clinical trials sponsored by the National Heart, Lung, and Blood Institute.

Although streptokinase, a bacterial product, has long been the drug of choice for dissolving blood clots, the protein called tissue plasminogen activator (t-PA) has gained support because of its specificity and immunologically neutral properties (SN: 11/26/83, p. 340; 3/10/84, p. 151). This new drug, based on a naturally occurring human protein, acts only at clots, whereas streptokinase acts throughout the bloodstream and can cause excess bleeding. Streptokinase triggers formation of antibodies, which bind up some of the drug and render it ineffective. But t-PA, as a human protein, is not likely to cause antibody production or allergic reaction.

The current study, reported in the April 4 NEW ENGLAND JOURNAL OF MEDICINE, corroborates the findings of earlier, smaller clinical and animal studies. It involved 214 heart attack patients with severe blockage of the coronary arteries, and was stopped early because t-PA produced such dramatic results. In 66 percent of patients given t-PA produced by recombinant DNA technology, the blocked arteries were significantly reopened. Arteries were reopened in only 36 percent of patients given streptokinase.

—D.D. Bennett

IUD-infertility link

Intrauterine devices (IUDs), the contraceptive choice of an estimated 2.2 million women in the United States, increase the likelihood of infertility, according to two studies in the April 11 NEW ENGLAND JOURNAL OF MEDICINE.

Previous studies have shown that women who use IUDs are more likely to get pelvic inflammatory disease (PID), which can damage fallopian tubes and lead to infertility. But these are the first studies to show a direct link, says Janet R. Daling, an epidemiologist at the University of Washington in Seattle and coauthor of one of the current papers. She and her colleagues found a higher rate of past IUD use in 159 women who are infertile because of fallopian tube damage than in a group of women who conceived around the time the infertile women started trying. They determined that IUD users had a 2.6 times higher risk of infertility, even if they hadn't had overt PID.

Some IUDs are riskier than others, they found. The Dalkon Shield, which is no longer marketed, raised its users' risk to 6.8 times that of controls, while the risk of copper-containing IUDs was only 1.3.

A second, multinational, multi-institutional study of 283 infertile women and 3,833 new mothers found similar risks, leading the researchers to estimate that IUDs have made about 88,000 women in the United States infertile. The two studies, Daling notes, were of different design and carried out in different regions of the United States, making the similar findings particularly strong. —J. Silberner