Light therapy for herpes: Good or bad?

Herpes simplex viruses are present in well over half the world's population, scientists estimate. Under the right conditions they can inflict an astonishing variety of damage on their victims—cold sores, skin lesions, keratitis (an eye disease that can lead to blindness), meningoencephalitis (inflammation of the brain). Herpes infections are now so rampant in the genital areas of men and women and passed back and forth so often through sexual intercourse that some researchers have dubbed them a new venereal disease epidemic. If genital herpes gets into the birth canal of a pregnant woman, it can kill the fetus she carries or permanently damage its brain. Genital herpes has been strongly linked to cervical cancer.

In spite of the many evils that herpes viruses can inflict, there is no effective drug for them on the American market. However, during the past several years various investigators, notably Joseph L. Melnick and his team at Baylor College of Medicine, have successfully fought various herpes diseases by treating them with light combined with photoreactive dyes. But the technique is controversial, Melnick acknowledged last week at the Third Conference on Antiviral Substances, sponsored by the New York Academy of Sciences.

It all started back in the early 20th century when an investigator observed that the light-reactive dye acridine was harmless to paramecia (one-celled animals) in the dark but killed them when they were exposed to light. During the 1930's viruses were shown to be light-sensitive. Then during the 1960's Melnick and his colleagues learned that viruses could be inactivated if they were exposed to both light and photoreactive dyes.

In 1972, Melnick and his team tried this treatment on rabbits with keratitis and obtained encouraging results. So in 1973 they set out to try the same treatment on patients with herpes infections of the lips, skin, mouth and genital areas. Some other investigators did, too. Double-blind trials, where some patients got the treatment and others did not, were used. Light plus dyes were found to be effective.

Still another encouraging clinical trial concerned an infant who served as his own double-blind trial. Both sides of his face were covered with hideous skin lesions caused by herpes. First light and dye were applied to one side of the infant's face. The virus was inactivated within 24 hours, and the side of the face was healed in four days. The treatment was then applied to the other side of the child's face and the same results were obtained.

All is not rosy for herpes light-dye therapy, though. Some investigators have obtained disappointing results. Martin G. Myers and his team at Harvard Medical School reported in the Nov. 6 NEW ENGLAND JOURNAL OF MEDICINE that light plus dye can inactivate herpes viruses in tissue culture but that the treatment did not get rid of herpetic lesions in patients or prevent the recurrence of their lesions. (The clinical trial they conducted included 96 patients and was double-blind.) Meyers and his co-workers concluded: "In the absence of demonstrated efficacy, the routine use of neutral red [the dye] and light in patients with recurrent herpes simplex virus infections should be discontinued." Then, a former member of Melnick's lab, Fred Rapp (now with the Hershey Medical Center, Hershey, Pa.), reported that light-plus-dye might even turn herpes viruses into cancer-causing viruses. Even the dyes used in the treatment have been accused of causing cancer.

Melnick counters some of these findings and claims. He says the Harvard group did not use enough light to achieve satisfactory results. They used a 100-watt incandescent light bulb that gave off 1.8 microwatts per square centimeter of light. This "is about one to two percent of the light that has been found effective in our studies," Melnick says. "And believe it or not," he adds," the Harvard group failed to measure the intensity of their light at the surface of the skin." Melnick and his team made sure that light of a wavelength of 533 nanometers reached the skin because this is the wavelength that is maximally absorbed by neutral red, the dye used at Harvard. When Melnick and his co-workers tested 100-watt incandescent light bulbs like those the Harvard group used, at the same distance to the skin—26.5 centimeters—they failed to detect any measurable light at 533 nanometers, with one exception.

As for Rapp's claim, Melnick insists it is based on only one animal experiment where light-dye treatment killed herpes infectivity but still allowed the viruses to transform cells into cancer cells and to produce tumors in hamsters. Melnick and his co-workers have not been able to confirm these results. Melnick also takes Rapp to task for writing: "It is curious that one would want to transform an infectious population of viruses often causing a mild disease into a population with demonstrated potential to transform normal cells into cancer cells."

"We cannot imagine whom he is chastizing," Melnick counters, "for no one that we know would want to do such an evil thing." Melnick says Rapp fails to recognize that herpes viruses, if left untreated, may still cause cancer. What's more, he says, his group has found that cancer cells are more sensitive to light-dye treatment than normal cells are, and another investigator has reported that light plus dye retarded tumor growth in mice.

As for the dyes alone causing cancer, Melnick cites tests conducted by the National Cancer Institute in rodents highly susceptible to carcinogenic chemicals. The dyes did not produce tumors in these animals.

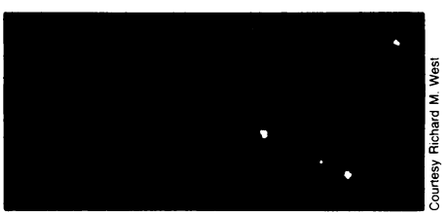
Melnick, nonetheless, agrees that light-dye therapy needs a lot more investigating, and that researchers should move cautiously. Some London scientists, for instance, used light plus dye to treat patients with keratitis. The treatment knocked out the disease, but it also harmed the patients' corneas. So the scientists are discontinuing light-dye therapy until they can figure out how to deliver it without hurting the cornea. □

Comet West may be visible in east

"I really am pretty sure," says Brian G. Marsden of the Smithsonian Astrophysical Observatory in Cambridge, "that this one will be brighter than Kohoutek." These days, of course, many astronomers would rather wager against loaded dice than second-guess an approaching comet, but compared with Comet Kohoutek's disappointing showing, Comet West may actually be a reasonable bet.

Richard M. West of the European Southern Observatory in Geneva found the object on Nov. 5 in a photo taken Sept. 24 with the ESO one-meter Schmidt telescope at La Silla, Chile. He has since located it in even earlier photos from Aug. 10 and 13, and by the first days of March it should be visible in the Northern Hemisphere's pre-dawn eastern sky.

The comet will pass closest to the sun, about 18 million miles, on Feb. 25, when it may get as bright as magnitude −0.4, but it will be only about 7 degrees away from the sun, making it virtually invisible to the naked eye. On Feb. 29 or March 1, however, it will pass about 74 million miles from the earth, when, Marsden calculates, it may still be as bright as magnitude 0.8. He says it should be in the best position for viewing around March 3 through 7, in the constellation Aquarius, although by then it may be dimmer than second magnitude.



Comet West in Aug. 13 La Silla photo.

No spectroscopic observations of Comet West (officially known as 1975n) have been made, but infrared studies from the University of Minnesota show a brightness progression similar to Kohoutek's. □