BUFFALO, NY--In January 1998, the Food and Drug Administration approved photodynamic therapy (PDT) using the sensitizer porfimer sodium (Photofrin) for the treatment of early-stage lung cancer. PDT was originally approved in 1995 for the palliative treatment of obstructive esophageal cancer. "The FDA approval this year for early-stage lung cancer is significant in that it is the first acceptance of this treatment as a method to cure a patient of cancer and not simply alleviate symptoms," Thomas J. Dougherty, PhD, said at the first meeting of the Regional Cancer Center Consortium for Biological Therapy of Cancer, hosted by Roswell Park Cancer Institute. Dr. Dougherty is chief of the Department of Radiation Biology/Photodynamic Therapy Center, at Roswell Park.

The difficulty with treating early-stage lung cancer, he said, is that "most patients do not present at that stage." A new Canadian endoscope, LIFE-Lung from Xillix Corp, will be tested with high-risk patients to try to locate these early-stage lung tumors. In the meantime, Dr. Dougherty said, the company that sponsors the Photofrin trials is seeking FDA approval for the treatment of late-stage lung cancer, since PDT has been shown to successfully destroy bulky tumors, resulting in improvement in dyspnea and hemoptysis.

PDT has been used in Japan and other countries to treat early-stage lung, stomach, cervical, and esophageal cancers. New studies of Photofrin and PDT are testing the efficacy of PDT on brain and skin cancers.

Another study, carried out by Dr. H. Takita at Roswell Park, is looking at the use of PDT as an adjuvant to surgery in the treatment of mesothelioma, a rare and generally incurable form of cancer, Dr. Dougherty said. Patients in this trial receive a dose of Photofrin 2 days prior to surgery. The surgeon attempts to remove all visible tumor from the chest cavity, and patients are then irradiated with laser light for up to 2½ hours to clear "invisible" tumor cells.

"While it appears that certain patients benefit from the combined treatment, a comprehensive trial is necessary in order to be certain of this," he added.

Another direction of PDT research involves developing new photosensitizers that lack the cutaneous photosensitivity of Photofrin and thus may have less effect on normal tissue. Photofrin is based upon the heme molecule, which sensitiizes normal tissue for up to 6 weeks. Researchers are now examining the use of a chlorophyll type of molecule as the basis for newer drugs.

"While PDT excels due to its relative nontoxicity to normal tissue, its use as an outpatient procedure, and ability to be performed multiple times based upon a patient's needs, we are looking for ways to shorten the types of effects seen with Photofrin after the treatment is completed," Dr. Dougherty said.

He added that although most patients are willing to be sun sensitive in order to remove their tumors, "we believe we can improve the pharmacokinetics and lessen the negative impact of the drug." Another speaker at the meeting described trials using Photofrin to treat high-grade dysplasia in Barrett's esophagus, a premalignant condition associated with adenocarcinoma of the esophagus. "Barrett's esophagus with high-grade dysplasia presents unusual challenges since it is the precursor to one of the fastest growing tumors," said Hector R. Nava, MD, associate chief, Division of Surgery, and chief of the Endoscopy Service, Roswell Park Cancer Institute. In 1987, a male patient presented with Barrett's esophagus, cancer in situ, and severe dysplasia. He refused to consider a standard esophagectomy and agreed to try PDT. The treatment method worked, Dr. Nava said, and the patient was completely free from the disease and is still living. Two other patients were treated with similar results.

"This work showed the efficacy of PDT for Barrett's esophagus and eliminated the need for surgery to treat this cancer in situ," Dr. Nava said.

A follow-up study by Bergein Overholt, MD, in Knoxville, Tenn, of 100 patients with dysplasia or tumor showed that PDT eliminated dysplasia in 77 of 100 patients and eliminated the Barrett's...
esophagus completely in 43 of 88 patients, although 35 of these patients required secondary
treatment with a YAG laser. Of the remaining 12 patients with cancer in situ, 10 had elimination of
the tumor.
A current study, organized by Quadra Logic Technologies, Vancouver, British Columbia, Canada, will
be testing PDT in 200 patients with severe dysplasia in Barrett’s esophagus.

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