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Treating Tobacco-Related Lung Cancer

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Therapies that preferentially target lung cancers harboring certain EGFR mutations can be effective in some lung cancers in never-smokers. And while these certain therapies may not work as well in lung cancers in smokers and former smokers, these patients may respond better to therapies that target other mutations and pathways.

Tumors release a protein called VEGF, or vascular endothelial growth factor, which signals the growth of blood vessels to feed the tumor, a process called angiogenesis. Avastin® (bevacizumab), a drug approved for non-small cell lung cancer and metastatic colorectal cancer, inhibits angiogenesis by binding to VEGF, thus slowing tumor growth. In a phase III study of close to 900 lung cancer patients, Avastin was found to improve median overall survival by 25 percent when combined with chemotherapy. Patients who received Avastin with chemotherapy had a median survival of 12.3 months compared with 10.3 months in patients treated with only chemotherapy. Side effects seen in the trial included low white blood cell count, fatigue, and high blood pressure.

In another study published in 2005, researchers combined Avastin with Tarceva to treat current and former smokers as well as patients who never smoked. Two of the nine patients (22.2 percent) who had never smoked had a partial response compared with six of 31 former or current smokers (19.4 percent). Although the effect was similar for both groups and the combination appears effective in either population, researchers caution more research is needed because of the small number of patients treated in this early-phase clinical trial.

Other treatment options include surgery if the cancer hasn't spread, radiation to the chest wall, and chemotherapy with agents such as Taxol, Gemzar® (gemcitabine), and cisplatin. Studies show smokers who stop smoking during chemotherapy respond better than those who continue to use tobacco. Researchers believe this effect may be because of the nicotine in tobacco. While not a carcinogen itself, nicotine may promote tumor growth by influencing certain biological pathways.

Research suggests never-smokers respond better to chemotherapy and have improved survival when compared with former and current smokers, but the outcome may be because never-smokers have less genetic damage or mutations from smoking, fewer health problems caused by smoking, and better lung function overall. Smokers and former smokers also have a higher risk of developing hard-to-treat lung cancers, such as squamous cell and small cell lung cancers, when compared with never-smokers, who are typically diagnosed with adenocarcinoma, a type of non-small cell lung cancer.