NEWS VIEWS

STUDY SUGGESTS NICOTINE MAY PROMOTE CANCER DEVELOPMENT

A report in the January 2003 issue of the Journal of Clinical Investigation (2003; 111:81-90) concludes that nicotine and its metabolite, 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) may contribute to lung carcinogenesis by functioning as tumor promoters.

Tobacco smoke contains over 40 known genotoxic initiators of carcinogenesis. The new information from this study suggests that nicotine and NNK inhibit apoptotic destruction of cells whose DNA has been damaged by these initiators, thereby allowing these cells the opportunity to persist and to undergo additional molecular changes eventuating in malignant transformation. In addition, exposure to these two compounds induced normal lung epithelial cell cultures to express two characteristics typical of malignant cells—a reduced dependence on growth factors and extracellular matrix, and an ability to continue growing under crowded conditions.

In their report, Phillip A. Dennis, PhD, and colleagues from the National Cancer Institute (NCI) in Bethesda, MD, and the Lovelace Respiratory Institute in Albuquerque, NM, also note previous studies indicating that nicotine might contribute to carcinogenesis via stimulation of angiogenesis. They conclude that, “…sustained exposure to nicotine might alter the phenotype of endothelial and/or epithelial cells in undetectable, premalignant lesions.”

The significance of these observations is twofold. Firstly, description of this pathway as a component in lung carcinogenesis suggests it might be a target for chemopreventive or therapeutic agents. These observations also raise a second question that is of immediate clinical relevance; that is, whether nicotine replacement therapy (NRT) might contribute to carcinogenesis.

“This certainly is a valuable study, conducted by an excellent research team,” said Thomas J. Glynn, PhD, National Director of Science and Trends at the American Cancer Society. “While well-conducted, [it] is preliminary and [this area] needs further investigation in order to unravel the complex puzzle of carcinogenesis.” Addressing its relevance to NRT, Glynn said, “Continuing to smoke is far worse than any short-term exposure to nicotine through NRTs. As the authors themselves suggest, the most important action for a smoker to take is to quit, and nicotine replacement medications have proven effective in helping smokers do that.”

In support of these conclusions, Glynn noted:

• This study concludes nicotine MAY...
promote lung cancer, but only after long-term use, which generally suggests a period of years. Most smokers who use NRT use it for about 12 weeks (depending on the product), so there is little indication from this research that proper use of these products would put a smoker in any greater danger than he or she faces from smoking, and most likely the risk would be far less.

- The study is based on laboratory examination of human tissue from a small sample of smokers and on animals exposed to nicotine. As the NCI itself stated, “…It is not yet known how Dennis’ laboratory findings relate to the human situation.” [Statement posted: 1/8/2003. Available at: http://cancer.gov/cancerinfo/nicotinestudy.]
- The NIH Lung Health Study tracked nicotine replacement therapy use in smokers and former smokers for about five years and failed to show an increased risk of lung cancer. [Murray RP, Bailey WC, Daniels K, et al. Chest 1996;109:438-445.]
- The US Surgeon General has determined that long-term use of smokeless tobacco (which involves long-term exposure to nicotine), while sharply increasing the risk of oral cancer, is not a cause of lung cancer.

For these reasons, Glynn advises physicians to reassure their patients who are users of NRT. Although this information might help motivate some patients to wean themselves off NRT after they have been tobacco free, patients who are currently using NRT for tobacco cessation should NOT consider stopping the use of their medication.

STATES’ SPENDING ON TOBACCO CONTROL DOWN THIS YEAR

This year’s “Show Us the Money” report on states’ allocation of tobacco settlement dollars reveals an 11 percent decline in spending on tobacco prevention and cessation programs. This report is the latest of ongoing updates released jointly by the Campaign for Tobacco-Free Kids, the American Cancer Society, the American Lung Association, the American Heart Association, and the SmokeLess States National Tobacco Policy Initiative.

Even though states collected more tobacco-generated revenue this past year than ever before (due to increased tobacco tax rates), in 2003, only four states—Maine, Maryland, Minnesota, and Mississippi—designated funding for tobacco control programs at or above levels recommended by the Centers for Disease Control and Prevention (CDC). This year, financially strapped states are increasingly using these funds for entirely unrelated programs.

“Gutting tobacco control programs is penny wise and pound foolish,” said John R. Seffrin, PhD, Chief Executive Officer of the American Cancer Society. “Ultimately, states are going to have to pay the piper in lives lost and spending on health care. Smoking is responsible for nearly one-third of all cancer deaths and kills 440,000 people every year. In 2002, economic losses due to tobacco-related illnesses were $157 billion. If states fail to fund proven strategies to help people quit or keep them from starting to smoke, the human and economic cost will only get higher.”

“The evidence is clear that tobacco prevention and cessation programs are part of the solution to the fiscal crisis states are facing,” said William V. Corr, Executive Vice President of the Campaign for Tobacco-Free Kids. “Those states that choose wisely to invest in tobacco prevention despite tight budgets will reap the benefits of fewer kids smoking, [more] lives saved, and taxpayer dollars saved by reducing smoking–caused health care costs.”

The longstanding tobacco prevention programs in California and Mississippi have been shown to save up to three dollars in health care costs for every dollar spent on prevention.