

# Early Diagnosis of Lung Cancer

**THOMAS L PETTY**  
University of Colorado

In an a previous editorial (HP, April 15, 2001), I made the case for the early diagnosis of asymptomatic chronic obstructive pulmonary disease (COPD). The basis for this recommendation is twofold. First, a national survey of a large U.S. population sample showed that many patients with asymptomatic and symptomatic COPD were undiagnosed and not receiving therapy.<sup>1</sup> Second, the Lung Health Study demonstrated that airway function (as judged by FEV<sub>1</sub>) improves in patients with mild to moderate COPD who successfully stop smoking, whereas function continues to deteriorate in patients who continue to smoke.<sup>2</sup>

Another major finding of the Lung Health Study, which followed 5,887 middle-aged smokers and exsmokers of both sexes, was that lung cancer is a more common cause of death than heart attack and stroke. The association between COPD—even early-stage disease—and lung cancer has been known for many years.<sup>3,4</sup> Recently, a 2% prevalence of lung cancer was reported among heavy smokers (i.e., 30 pack-years or more) with airflow obstruction who were evaluated by sputum cytology<sup>5</sup> or low-dose helical computed tomography (CT).<sup>6</sup> Lung cancer was detected at an early stage in both of these studies, indicating that cures could be expected in these patients. Thus, it seems reasonable to embark on lung cancer screening programs, particularly in high-risk groups.

The arguments against early diagnosis of lung cancer are based on three studies sponsored by the National Cancer Institute (NCI) in the mid-1970s. These studies concluded that even though resectability and survival were increased in screened patients, overall disease-specific mortality did not change substantially.<sup>7</sup> However, the emphasis on mortality in large groups denies the importance of improved survival in selected patients. The arguments of lead-time bias, length-time bias, and tumor-biology bias are based on the fact that screening identifies lesions early in their natural history, and that early tumors may be biologically less aggressive than late-stage tumors. Such arguments imply that these tumors do not require identification, which does not make sense to me. The very point of early diagnosis is to find lung cancer

Dr. Petty is Professor, Department of Medicine, University of Colorado Health Sciences Center, and Chairman, National Lung Health Education Program, Denver.

when it is noninvasive, relatively less aggressive, and amenable to cure. Indeed, follow-up of a well-characterized cohort of patients with roentgenographically occult lung cancer that was identified by sputum cytology showed improved survival of many years, compared with outcomes of conventionally managed patients.<sup>8,9</sup>

Today, the technology for the early diagnosis of lung cancer is much better than it was when the NCI studies were conducted. Helical CT is a very sensitive but not so specific test, particularly in geographical regions where fungal-induced granulomas are common, such as in the midwest (histoplasmosis) and southwest (coccidioidomycosis). Additional technologies, such as positron emission tomography, will further separate malignant from benign lesions.<sup>10</sup> Improved sputum cytology employing automated high-volume computer-oriented image detecting adds still another dimension to early diagnosis.

Heavy smokers with airflow obstruction may present with cough, expectoration, or dyspnea; however, many of them are asymptomatic. All heavy smokers with airflow obstruction by definition have a diagnosis of COPD (ICD-9 codes 492-496). Thus, the further evaluation of these patients with sputum cytology and CT scanning is not only reasonable but also justifies reimbursement. And it should not be forgotten that lung cancer is diagnosed more often in former smokers than in current smokers."

We finally have the knowledge and the technology to alter the course of lung cancer, the most common fatal malignancy in men and women. The prevention of smoking, although a laudable goal, will not change the epidemic of lung cancer in the foreseeable future. All primary care physicians should have a spirometer in their offices and test all patients who smoke for airflow obstruction. Obviously, smoking cessation should be recommended to all smoking patients, but the need is most critical in those with airflow obstruction. By stopping smoking, the progression of COPD can be slowed or stopped and the prevalence of lung cancer reduced as years of smoking abstinence accrue.Q

## REFERENCES

1. Mannino DM. Obstructive lung disease and low lung function in adults in the United States: Data from the National Health and Nutrition Examination Survey, 1988-1994. *Arch Intern Med* 160:1683, 2000
2. Anthonisen NR et al. Effects of smoking intervention and the use of an inhaled anticholinergic bronchodilator on the rate of decline of FEV<sub>1</sub>. The Lung Health Study. *JAMA* 272:1497, 1994
3. Skillrud DM, Offord KR Miller RD. Higher risk of lung cancer in chronic obstructive pulmonary disease. A prospective, matched, controlled study. *Ann Intern Med* 105:503, 1986
4. Tockman MS et al. Airways obstruction and the risk for lung cancer. *Ann Intern Med* 106:512, 1987
5. Kennedy TC et al. Cytopathological analysis of sputum in patients with airflow obstruction and significant smoking histories. *Cancer Res* 56:4673, 1996
6. Henschke CI et al. Early Lung Cancer Action Project Overall design and findings from baseline screening. *Lancet* 354:99, 1999
7. Patz EF Jr, Goodman PC, Bepler G. Screening for lung cancer. *N Engl J Med* 343:1627, 2000
8. Bechtel Jj et al. Outcome of 51 patients with roentgenographically occult lung cancer detected by sputum cytologic testing: A community hospital program. *Arch Intern Med* 154:975, 1994
9. Bechtel JJ, Petty TL, Saccomanno G. Five-year survival and later outcome of patients with x-ray occult lung cancer detected by sputum cytology. *Lung Cancer* 30:1, 2000
10. Sazon DA et al. Fluorodeoxyglucose-positron emission tomography in the detection and staging of lung cancer *Am J Respir Crit Care Med* 153:417, 1996
11. Burns DM. Primary prevention, smoking, and smoking cessation: Implications for future trends in lung cancer prevention. *Cancer* 89(11 Suppl):2506S, 2000