

Annual CT Screening for Lung Cancer May Significantly Improve Survival

International Early Lung Cancer Action Program Investigators; Henschke CI, Yankelevitz DF, Libby DM, et al. Survival of patients with stage I lung cancer detected on CT screening. N Engl J Med 2006;355:1763–71.

Study Overview

Objective. To evaluate the outcome of stage I lung cancer detected on yearly screening using low-dose spiral computed tomography (CT).

Design. Observational cohort study.

Setting and participants. From 1993 through 2005, 31,567 asymptomatic persons aged ≥ 40 years who were at risk for lung cancer (personal history of smoking; exposure to secondhand smoke; or occupational exposures to asbestos, beryllium, uranium, or radon) were enrolled in the Early Lung Cancer Action Project (ELCAP) and underwent baseline screening using low-dose CT. From 1994 through 2005, 27,456 patients received annual screening 7 to 18 months after baseline screening.

Main outcome measure. 10-year lung cancer–specific survival rate among patients with clinical stage I lung cancer.

Main results. Screening resulted in a diagnosis of lung cancer in 484 participants, of whom 412 (85%) had clinical stage I lung cancer. For all patients with lung cancer, the estimated 10-year survival rate was 80% (95% confidence interval [CI], 74%–85%). In the subgroup of patients with stage I lung cancer, the estimated 10-year survival rate was 88% (95% CI, 84%–91%). Among the 302 participants with clinical stage I cancer who underwent surgical resection

within 1 month after diagnosis, the survival rate was 92% (95% CI, 88%–95%). The 8 participants with clinical stage I lung cancer who did not receive treatment died within 5 years of diagnosis.

Conclusion. Annual screening with low-dose spiral CT can detect lung cancer at a curable stage.

Commentary

Lung cancer is the leading cause of cancer-related death among men and women in the United States. Approximately 174,470 new cases of lung cancer and 162,460 lung cancer–associated deaths are predicted in the United States for 2006 [1]. In 2004, the U.S. Preventive Services Task Force concluded that there is insufficient evidence to recommend for or against screening asymptomatic persons for lung cancer with either low-dose CT, chest radiography, sputum cytology, or a combination of these tests [2]. While some data support that screening with low-dose CT, chest radiography, or sputum cytology can detect lung cancer at an earlier stage, there is little evidence suggesting that any screening strategy for lung cancer decreases mortality. In a Mayo Clinic study of 1500 patients that used low-dose CT for lung cancer screening, 10 patients underwent surgery for excision of benign nodules and 21 patients had stage I lung cancer [3].

In the current study, Henschke and colleagues reported on the outcomes of all patients who had stage I lung cancer

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detected by spiral CT. A particular strength of this study was that it was conducted globally in community and academic centers using a standardized protocol, thereby demonstrating generalizability. The reported 88% 10-year survival rate among patients with stage I lung cancer is astounding, given the previous survival rate of 70% at 5 years. Results of this study suggest that screening with CT can detect lung cancer at a stage where treatment can offer significantly improved survival.

Unlike other CT screening studies, this study did not limit the "at-risk" population to smokers. In fact, some patients enrolled in Japan were screened as part of an annual physical examination, potentially affecting the yield. Further, as with all observational screening studies, lead-time, length, and volunteer biases can be introduced. In late 2002, the National Institutes of Health launched the National Lung Screening Trial, a randomized controlled trial that randomly assigned 50,000 current or former smokers from 30 U.S. sites to lung cancer screening with either spiral CT or chest radiography on an annual basis for 3 years. The trial is closed, and preliminary results are expected in 2008 [4].

Applications for Clinical Practice

Annual CT screening has the potential to improve 10-year survival rates for patients at risk for lung cancer. Results from randomized controlled studies may soon provide further support for screening asymptomatic individuals at risk for lung cancer.

—Review by Mark S. Hornig, MD, MPH

References

1. American Cancer Society. Cancer facts and figures 2006. Available at: www.cancer.org/downloads/STT/CAFF2006PWSecured.pdf. Accessed 8 Nov 2006.
2. U.S. Preventive Services Task Force. Lung cancer screening: recommendation statement. *Ann Intern Med* 2004;140:738–9.
3. Crestanello JA, Allen MS, Jett JR, et al. Thoracic surgical operations in patients enrolled in a computed tomographic screening trial. *J Thorac Cardiovasc Surg* 2004;128:254–9.
4. National Cancer Institute. National Lung Cancer Screening Trial. Available at www.cancer.gov/nlst. Accessed 8 Nov 2006.

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(continued on page 670)