SCREENING

CT screening for lung cancer: winner confirmed

Lung cancer is the leading cause of cancer mortality worldwide, and most patients with the disease are current or former smokers. The US National Lung Screening Trial (NLST) that assessed annual screening in heavy smokers demonstrated that the mortality risk of lung cancer was lower with low-dose spiral CT than with chest radiography, and established the superiority of spiral CT over chest X-ray screening. The trial took over 9 years to complete, and in the latest study, published in the *New England Journal of Medicine*, the actual findings at each screening examination and subsequent diagnostic evaluations have been reported.

At 33 centres, 53,439 eligible participants aged 55–74 years with a history of at least 30-pack years of smoking were enrolled. The participants were randomly assigned to undergo annual screening for 3 years with low-dose spiral CT or chest radiography. The researchers used simple statistics to estimate the frequencies of positive screening tests, diagnostic methods used, and different types of cancers found. Sensitivity, specificity, and positive predictive values were estimated by ratio estimators and bootstrapping was used to estimate the variances.

Timothy Church, one of the leading investigators of the trial, highlights the background to the study. “We felt the most straightforward approaches were appropriate, because we wanted the results to be transparent and useful not only for clinicians, but for those who might want to model the screening process for cost-effectiveness analyses.”

A total of 7,191 (273.3%) participants in the CT group and 2,387 (9.2%) in the radiography group had a positive screening result. During the first screening rounds, as expected, more positive screen results, more diagnostic procedures, and more lung cancers were detected in the low-dose CT group compared with the radiography group. In addition, a higher number of early stage cancers were diagnosed in the CT group, although the numbers of late-stage cancers were similar for both groups. Compliance rates for the study were considerably higher (98.5%), than the 85% rate assumed based on sample size calculations.

Church summarizes, “the results from the initial screening round in the trial were consistent with other observational studies and randomized trials reported to date, both from the spiral CT arm and chest radiography arm. Coupled with the observation that the population was similar to the general population of heavy smokers in the USA, these findings suggest that a 20% reduction in lung cancer deaths can be obtained in general population screening of heavy smokers with spiral CT.”

In the future, Church and his colleagues plan to assess the cost-effectiveness of spiral CT screening. He also comments, “although reducing lung cancer death by 20% is an important finding, improving the sensitivity and specificity of the screening process would conceivably reduce the harm of unnecessary diagnostic testing and treatment, and could increase the mortality benefit.”

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