COST-EFFECTIVENESS OF FOLLOW-UP OF INCIDENTAL LUNG NODULES DETECTED DURING CONTRAST ENHANCED CORONARY CTA IN PATIENTS WITH CHEST PAIN

ACC Poster Contributions
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Background: Though coronary CTA (CCTA) has become increasingly important, there remains a debate about how best to address incidental lung nodule findings. Previous studies on this topic have estimated the costs of further work-up and treatment but have failed to account for the altered health outcomes associated with earlier detection and treatment of lung cancer. Our objective was to apply the MGH Lung Cancer Policy Model (LCPM) to predict costs, effectiveness and cost-effectiveness of follow-up of lung nodules detected during CCTA in the full chest field of view vs. no follow-up.

Methods: The LCPM is a microsimulation model that simulates the natural history of lung cancer based on age, gender and smoking history (http://cisnet.cancer.gov/lung/profiles.html). The model predicts the remaining life expectancy, causes of death and costs associated with follow-up and treatment of lung nodules. To enable a specific analysis of symptomatic patients referred for CCTA, we obtained demographics from the 591 patients who underwent routine CCTA and had incidental lung nodules requiring follow-up but no prior history of malignancy, among the about 4,000 routine CCTAs that were performed at our institution between 2005 and 2009.

Results: The referral population had a mean age of 59.4±9.4 years and was 65% male, 27% current and 32% previous smokers, and 22% CAD. The model predicted the detection of 17 malignancies if incidental lung nodules ≥ 4mm were followed up according to guidelines. Further, the model predicted 19 deaths from lung cancer (232 from CHD) when follow-up (FU) was performed vs. 20 deaths from lung cancer (231 from CHD) without follow-up. Mean quality-adjusted life expectancy was 17.23 years for the FU group vs. 17.21 years for the non-FU group. The mean lifetime costs per patient were estimated at $243,400 for FU and at $238,800 for non-FU. The incremental cost-effectiveness ratio (ICER) of FU vs. non-FU was $313,100 per quality-adjusted life year (QALY) gained. When any nodule was followed-up, the ICER increased to $315,900/QALY.

Conclusion: Preliminary analyses show limited cost-effectiveness of incidental pulmonary nodule reporting in the full chest field of view in patients undergoing CCTA.