

Decision-tree sensitivity analysis for cost-effectiveness of whole-body FDG PET in the management of patients with non-small-cell lung carcinoma in Japan

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Background: Whole-body 2-fluoro-2-D-[¹⁸F]deoxyglucose [FDG] positron emission tomography (WB-PET) may be more cost-effective than chest PET because WB-PET does not require conventional imaging (CI) for extrathoracic staging. **Methods:** The cost-effectiveness of WB-PET for the management of Japanese patients with non-small-cell lung carcinoma (NSCLC) was assessed. Decision-tree sensitivity analysis was designed, based on the two competing strategies of WB-PET vs. CI. WB-PET was assumed to have a sensitivity and specificity for detecting metastases, of 90% to 100% and CI of 80% to 90%. The prevalences of M1 disease were 34% and 20%. One thousand patients suspected of having NSCLC were simulated in each strategy. We surveyed the relevant literature for the choice of variables. Expected cost saving (CS) and expected life expectancy (LE) for NSCLC patients were calculated. **Results:** The WB-PET strategy yielded an expected CS of \$951US to \$1,493US per patient and an expected LE of minus 0.0246 years to minus 0.0136 years per patient for the 71.4% NSCLC and 34% M1 disease prevalence at our hospital. PET avoided unnecessary bronchoscopies and thoracotomies for incurable and benign diseases. Overall, the CS for each patient was \$833US to \$2,010US at NSCLC prevalences ranging from 10% to 90%. The LE of the WB-PET strategy was similar to that of the CI strategy. The CS and LE minimally varied in the two situations of 34% and 20% M1 disease prevalence. **Conclusions:** The introduction of a WB-PET strategy in place of CI for managing NSCLC patients is potentially cost-effective in Japan.

Key words: cost-benefit analysis, fluorine-18-deoxyglucose, emission-computed tomography, non-small-cell lung carcinoma, life expectancy