

Medical economics of whole-body FDG PET in patients suspected of having non-small cell lung carcinoma—Reassessment based on the revised Japanese national insurance reimbursement system

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Focusing on the savings expected from the revised Japanese national insurance reimbursement system in the management of patients suspected of having non-small cell lung carcinoma (NSCLC), cost-effectiveness was assessed using decision tree sensitivity analysis on the basis of the 2 competing strategies of whole-body FDG PET (WB-PET) and conventional imaging (CI). **Methods:** A WB-PET strategy that models dependence upon chest FDG PET scan, WB-PET scan, and brain MR imaging with contrast was designed. The cost of a FDG PET examination was updated and determined to be US\$625.00. The CI strategy involves a combination of conventional examinations, such as abdominal CT with contrast, brain MR imaging with contrast, and a whole-body bone scan. A simulation of 1,000 patients suspected of having NSCLC (Stages I to IV) was created for each strategy using a decision tree and baselines of other relevant variables cited from published data. **Results:** By using the WB-PET strategy in place of the CI strategy for the management of patients suspected of having NSCLC in hospitals with an NSCLC prevalence of 75%, the cost saving (CS) for each patient would be US\$697.69 for an M1 prevalence of 20% and US\$683.52 for an M1 prevalence of 40%, but the CS gradually decreases as the NSCLC prevalence increases. The break-even point requires less than an 80% prevalence in order for the WB-PET strategy to gain life expectancy (LE) per patient. By using the WB-PET strategy in place of the CI strategy for the management of patients suspected of having NSCLC in hospitals with an NSCLC prevalence of 75%, the gain in LE for each patient would be 0.04 years (11.06 vs. 11.02 years) for an M1 prevalence of 20% and 0.10 years (10.13 vs. 10.03 years) for an M1 prevalence of 40%. The maximum cost of a PET study without losing LE would be US\$1322.68 per patient for prevalences of 75% NSCLC and 20% M1 disease. **Conclusions:** The present study quantitatively showed WB-PET, employed in place of CI for managing NSCLC patients, to be cost-effective in the Japanese revised insurance reimbursement system. However, the present cost is very low from the industrial viewpoint.

Key words: cost-benefit, ^{18}F -FDG, lung cancer, staging