Cost-Effectiveness Analysis for Treatment Modalities of Breast Cancer

Hyun Soo Shin, M.D.

Department of Radiation Oncology, College of Medicine Pochon CHA University,
Pundang CHA General Hospital, Sungnam, Korea

Background To examine the cost-effectiveness of radiation therapy following mastectomy or conservative surgery for breast cancer.

Methods Using Markov model, a cost-utility analysis was performed to compare a strategy of radiation therapy versus no radiation therapy in patient following mastectomy or conservative surgery. Local recurrence, distant recurrence, and survival rates used in the model were derived from a previously reported data. Utilities for the health states were collected from actual patients. Direct medical costs were estimated using data from a single institution. Years of life, quality-adjusted life-years (QALYs), costs, and incremental cost/QALY over a 7 or 10-year time horizon were calculated by the model for each strategy.

Results The addition of radiation therapy following mastectomy results in a cost increase of ₩1,040,350 per patient, and an increase of 0.85 QALYs per patients, which leads to an incremental cost-effectiveness ratio of ₩1,223,941/QALY. Also, the addition of radiation therapy following conservative surgery results in a cost increase of ₩1,451,654 per patient, and an increase of 0.29 QALYs per patients, which leads to an incremental cost-effectiveness ratio of ₩5,005,705/QALY. Sensitivity analysis for radiation therapy following mastectomy shows the ratio to be heavily influenced by the cost of radiation therapy, and to be slightly influenced by local recurrence and survival rates, but to be not influenced by utilities. Sensitivity analysis for radiation therapy following conservative surgery shows the ratio to be heavily influenced by the cost of radiation therapy, and to be slightly influenced by utilities, but to be not influenced by local recurrence and survival rates.

Conclusion It is impossible to confirm that the addition of radiation therapy for breast cancer is cost-effective compared with other accepted medical interventions. But this study illustrates the importance of considering an intervention’s effect on quality of life, as well as survival in defining cost-effectiveness.