

Economic analysis of targeting chemotherapy using a 21-gene RT-PCR assay in lymph-node-negative, estrogen-receptor-positive, early-stage breast cancer.

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Abstract

OBJECTIVE: To appraise the economics of a recurrence score (RS), based on an assay that predicts distant recurrence-free survival in lymph-node-negative (LN-), estrogen-receptor-positive (ER+) patients with early-stage breast cancer receiving tamoxifen.

STUDY DESIGN: Cost-utility analyses using a decision analytic model.

METHODS: Using a Markov model, we forecast overall survival, costs, and cost effectiveness of using the RS in patients classified as having low or high risk of distant recurrence based on National Comprehensive Cancer Network (NCCN) clinical guidelines. Data from a large multicenter clinical trial (NSABP B-14) were analyzed to derive risk classification based on guideline criteria and RS assignments. Efficacy of adjuvant chemotherapy (CT) on distant recurrence-free survival (DRFS) was based on published meta-analyses of CT trials. The analysis took a societal perspective, considering survival, quality of life, and relevant costs.

RESULTS: Fifty-three patients (8%) were classified as having low risk of distant recurrence by NCCN guidelines and the RS reclassified 15 of these patients (28%) to an intermediate/high-risk group. The remaining 615 patients (92%) were classified at high risk of distant recurrence by NCCN guidelines and the RS reclassified 300 of these patients (49%) to a low-risk group. Among a hypothetical cohort of 100 patients, RS is predicted on average to increase quality-adjusted survival by 8.6 years and reduce overall costs by \$202 828. RS was cost saving in more than two-thirds of probabilistic simulations, with cost effectiveness most influenced by the propensity to administer CT based on RS results, and by the proportion of patients at low risk as defined by NCCN guidelines.

CONCLUSIONS: The RS predicts more accurately than current guidelines recurrence risk in LN-, ER+ patients with early-stage breast cancer. If applied appropriately, the assay is predicted to increase quality-adjusted survival and save costs.

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