Cost-effectiveness of chemoprevention of breast cancer using tamoxifen in a postmenopausal US population

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The objective was to evaluate the cost-effectiveness of chemoprevention of breast cancer with tamoxifen among postmenopausal women aged 55 years and less. The authors concluded that tamoxifen was a cost-effective treatment option. The authors conclusions are appropriate within the limited scope of the analysis undertaken.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
The objective was to evaluate the cost-effectiveness of chemoprevention of breast cancer with tamoxifen among postmenopausal women aged 55 years and less.

Interventions
Five-year treatment with tamoxifen was compared against no treatment.

Location/setting
USA/secondary care.

Methods
Analytical approach:
The analysis used a dynamic mathematical model that simulated breast cancer incidence, tumour growth, detection and spread, survival and healthcare processes associated with breast cancer. The model assumed that the breast cancer risk reduction persisted for 10 years after active treatment, based on data from clinical trials. The time horizon was lifetime. The authors did not report the study perspective, but it appeared to be that of health care payer.

Effectiveness data:
Clinical data were derived from published studies. Risk profiles of patients were from clinical studies and breast cancer associated surveillances. Data on treatment adverse events were derived from a meta-analysis of four tamoxifen chemoprevention trials. The main clinical input was the risk of ER-negative breast cancer and the effect of tamoxifen on that risk.

Monetary benefit and utility valuations:
Utility values were derived from published studies.

Measure of benefit:
Quality-adjusted life years (QALYs) and life years were the measures of benefit. They were discounted at an annual rate of 3%.

Cost data:
One year supply of tamoxifen, adverse events costs (deep vein thrombosis, pulmonary embolism, cataracts), cancer treatment (breast and endometrial) and terminal care (last year of life). Cost data were derived from various published sources. The price year was 2010. Costs were reported in USA dollars ($) and discounted at an annual rate of 3%.

Analysis of uncertainty:
Sensitivity analysis were conducted to assess the impact of uncertainty in the key model inputs, which included risk of cancer and associated morbidities, duration of risk reduction of the treatment and costs.

**Results**

Compared to no treatment, tamoxifen saved 36 life years and 29 QALYs per 1,000 treated women. It cost an additional $333,000 per 1000 women. The incremental cost-effectiveness ratio for tamoxifen compared with no treatment was $9,317 per life year saved and $11,528 per QALY gained.

When treating for women with higher five-year risk, tamoxifen was cost saving in that it saved more life years and QALYs at lower costs. The sensitivity analysis demonstrated that the results were sensitive to inputs that characterised menopausal symptoms and adverse effects of tamoxifen.

**Authors’ conclusions**

The authors concluded that tamoxifen was a cost-effective treatment option for postmenopausal women aged 55 years and less.

**CRD commentary**

Interventions:

The intervention was described appropriately. The authors justified their use of no treatment as the comparator. However, excluding other treatments implicitly suggested that the only treatment options available to the population evaluated were no treatment or tamoxifen. If any other treatments were valid options then a more comprehensive analysis would be required.

Effectiveness/benefits:

The authors provided limited details of how the studies used to derive the clinical data were identified. This made it difficult to judge whether all the available evidence was included. There was a suggestion that the trials used represented the available evidence. Assumptions were required in order to supplement the evidence and most of these were tested in sensitivity analysis. Probabilistic analysis may have allowed for better characterisation of the underlying uncertainty in the model inputs. The sources of utility data were reported, but there were no details on how the utilities were derived. The authors highlighted the disparity across published utility values and suggested this was caused mostly by population differences. The authors did not report population details for the derivation of the utility weights they elected to use and did not provide a rationale for their selections.

Costs:

The perspective was not reported explicitly, but it appeared that all costs associated with the perspective of a health care payer were included. Sources of cost data were fully referenced, but the methods used to estimate the costs were not provided. Future costs were discounted appropriately and the price year was reported. The costing lacked detail; it appeared feasible, but the lack of detailed costing made assessment of the appropriateness of resource use assumptions impossible.

Analysis and results:

The analytic method was fully reported. The model structure was well presented with diagrams and tables. Costs and benefits were appropriately synthesised and the results were reported clearly and in full. Some sensitivity analyses were performed to assess the impact of the uncertainty in the model inputs and the results were reported clearly. The limited scope of the interventions compared and a lack of detail surrounding the derivation of model inputs were limiting factors.

Concluding remarks:

The authors conclusions are appropriate within the limited scope of the analysis undertaken.

**Bibliographic details**
