Cost-effectiveness of switching to exemestane versus continued tamoxifen as adjuvant therapy for postmenopausal women with primary breast cancer

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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.

Health technology
The study considered the treatment of postmenopausal women with primary breast cancer with tamoxifen for 2.5 years followed by exemestane for 2.5 years. The comparator was continuation with tamoxifen for another 2.5 years.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis, cost-utility analysis

Study population
The study population comprised a hypothetical cohort of postmenopausal women aged 64 years old with resected unilateral invasive breast cancer, which was either estrogen receptor-positive or of unknown estrogen receptor status. The women had been on tamoxifen for 2.5 years.

Setting
The study setting was tertiary outpatient care. The economic study was carried out in Canada.

Dates to which data relate
The clinical effectiveness and resource use data were taken from a study published in 2004. The price year was 2004.

Modelling
A Markov model with a time horizon of 7.5 years was used to identify the long-term clinical and resource use implications of the two treatment regimens. The health states, cycle length and transitional probabilities were detailed in the paper.

Study designs and other criteria for inclusion in the review
The clinical data included the probability of local, contralateral and distant disease recurrence, mortality from breast cancer, mortality from other causes and adverse events from the drugs (osteoporosis and cardiac disease).

Sources searched to identify primary studies
The clinical effectiveness data were taken from a reanalysis of a randomised controlled trial (Coobes et al. 2004, see ‘Other Publications of Related Interest’ below for bibliographic details). After 48 months, probabilities were extrapolated using Kaplan-Meier curves. One or two estimates were based on expert opinion.

Methods used to derive estimates of effectiveness
The authors did not indicate the methods used to identify the study that provided the clinical effectiveness data. No inclusion criteria were reported. An expert panel reviewed all data included in the model.

Measure of benefits used in the economic analysis
The measures of health benefit were the life-years gained and quality-adjusted life-years (QALYs) gained. These measures were estimated using the model. Health state valuations were taken from published studies. The sources were referenced but the methods used to value the utilities were not described. Future health gains were discounted at an
annual rate of 5%.

**Direct costs**
The direct costs to the health care payer were identified in this study. The costs of drugs, treating disease recurrence and adverse events were included in the study. Resource use was estimated by the model, using resource use data from the randomised controlled trial supplemented by an expert panel. The costs of treating disease recurrence were taken from published studies, while the expert panel estimated the costs of monitoring disease-free patients. The source of the drug unit costs was not reported in the paper. A breakdown of the unit costs was provided. Future costs were discounted at an annual rate of 5%. The price year was 2004.

**Statistical analysis of costs**
No statistical analysis of the costs was included in this study.

**Indirect Costs**
No productivity costs were included in this study.

**Currency**
Canadian dollars (CAD).

**Sensitivity analysis**
One-way sensitivity analyses were undertaken to assess variability in the data. Sensitive parameters were also included in multi-way sensitivity analyses. The ranges used for the cost data were varied between 50% and 150% of the base-case values. The hazard ratios between the two treatment groups were varied using their 95% confidence intervals. Utility values were varied by +/- 20%.

**Estimated benefits used in the economic analysis**
The tamoxifen followed by exemestane group produced an estimated 6.2559 life-years and 5.8989 QALYs. The tamoxifen only group produced an estimated 6.1531 life-years and 5.7794 QALYs.

**Cost results**
The total cost was CAD 16,836 for the tamoxifen followed by exemestane group and CAD 13,947 for the tamoxifen only group.

**Synthesis of costs and benefits**
The incremental cost of tamoxifen followed by exemestane compared with tamoxifen alone was CAD 28,119 per life-year gained and CAD 24,185 per QALY.

The sensitivity analyses resulted in incremental cost-effectiveness ratios ranging from CAD 13,081 to CAD 55,606 per life-year gained and CAD 10,102 to CAD 49,908 per QALY gained.

**Authors' conclusions**
The authors concluded that, for postmenopausal women with primary breast cancer, the use of tamoxifen for 2.5 years followed by exemestane for 2.5 years was cost-effective in comparison with tamoxifen for 5 years.

**CRD COMMENTARY - Selection of comparators**
This study compared treatment with tamoxifen for 2.5 years followed by exemestane compared with tamoxifen alone was CAD 28,119 per life-year gained and CAD 24,185 per QALY. This comparator was chosen as it represented usual practice in the study setting. You should consider how this compares with usual practice in your own setting before applying the results of this study.

**Validity of estimate of measure of effectiveness**
The model parameters were taken from a reanalysis of a prior randomised controlled trial and were reviewed by an expert panel. The authors did not include any information on how they identified this trial, or any inclusion criteria that
were applied.

Validity of estimate of measure of benefit
Two measures of health benefit were included in the economic analysis. Both life-years gained and QALYs can be used to compare the impact of the drug regimens examined in this study with other interventions for breast cancer and other diseases. No utilities for adverse events were included, but the authors did not explain why.

Validity of estimate of costs
The study was conducted from the perspective of a health care payer. Only costs incurred after 2.5 years of commencing treatment were identified, as the treatment in the first 2.5 years was the same in both groups. However, this is unlikely to have altered the study findings. All appropriate costs appear to have been included for the period covered in the study. A breakdown of the unit costs was provided in the paper. Future costs were appropriately discounted. These factors add to the generalisability of the study findings. However, the resource use data were not specified clearly, which may have hindered generalisability. A clear price year was reported, which will enable future reflation exercises.

Other issues
The authors do not appear to have presented their results selectively and their conclusion reflects the scope of the analysis. They noted that there were differences in the proportion of patients having a mastectomy and receiving adjuvant therapy in the Canadian population and the sample in the randomised controlled trial. However, the authors did not discuss the likely impact of this difference in population characteristics on the economic effectiveness of the study regimens. The authors compared their study findings with those from other similar studies and discussed reasons for the differences.

Implications of the study
The authors did not make any direct recommendations for further research or changes to practice. They indicated that their study supports recent recommendations to fund tamoxifen followed by exemestane for postmenopausal women with breast cancer in Canada.

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Other publications of related interest
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MeSH
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