Cost effectiveness of exemestane versus tamoxifen in post-menopausal women with early breast cancer in Germany

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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
This study evaluated the cost-effectiveness of continuing treatment with tamoxifen or switching to treatments such as exemestane, after initial treatment with tamoxifen for two-to-three years, for postmenopausal women with oestrogen receptor-positive early-stage breast cancer. The authors concluded that exemestane was likely to be cost-effective, compared with tamoxifen, in the German health care setting. There was a lack of information regarding the effectiveness data, which makes it unclear if the authors' conclusions are appropriate.

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

Study objective
This study aimed to evaluate the cost-effectiveness of continuing treatment, for two to three years, with tamoxifen or switching to an alternative, such as exemestane, after initial treatment with tamoxifen for two to three years, in postmenopausal women with oestrogen receptor-positive early-stage breast cancer.

Interventions
The interventions were additional treatment with tamoxifen 20mg daily versus third-generation aromatase inhibitors, such as exemestane 25mg daily. The usual care in the setting was considered to be tamoxifen for up to five years in total.

Location/setting
Germany/secondary care.

Methods
Analytical approach:
A state-transition Markov model was used to estimate the clinical and economic outcomes associated with the treatment options, using effectiveness data from a randomised controlled trial. Adverse events, such as osteoporosis, endometrial cancer, thromboembolism, and deep-vein thrombosis, were incorporated into the model using separate health states. The time horizon was lifetime, with a maximum of 38 years. The cycles were six months long and half-cycle corrections were used to account for events occurring during a cycle. The authors stated that the perspective was that of the German Statutory Health Insurance payer.

Effectiveness data:
The effectiveness evidence, for the first 36 months of the model, came from the Intergroup Exemestane Study (IES), which compared continuing treatment with tamoxifen against switching to exemestane. The main clinical parameters were the recurrence of breast cancer, remission, and death from breast cancer.

Monetary benefit and utility valuations:
The utility estimates, for all the relevant health states, were derived from a number of international published studies.

Measure of benefit:
The measure of benefit was the number of quality-adjusted life-years (QALYs), which were discounted at an annual rate of 5%.
Cost data:
The direct health care costs included those of the drugs, adverse events, and operations, chemotherapy, and terminal care for breast cancer. In-patient treatment costs were from the Diagnosis-Related Group (DRG) Browser, out-patient costs were based on the Einheitlicher Bewertungsmassstab (EBM) 2000 plus, and drugs were based on current market prices from the Red Book Service. The appropriate DRGs for the different health states were identified using medical expert opinion. Future costs were discounted at a rate of 5% per annum and the currency was Euros (EUR).

Analysis of uncertainty:
A probabilistic sensitivity analysis was performed, using 1,000 Monte Carlo simulations. The results of this analysis were presented in a cost-effectiveness acceptability curve.

Results
The cost of exemestane was estimated to be EUR 10,827 compared with EUR 6,631 for tamoxifen, an incremental cost for exemestane of EUR 4,195.

Treatment with exemestane was associated with 9.9976 QALYs compared with 9.7597 QALYs for tamoxifen, an incremental QALY gain of 0.2379 with exemestane.

The incremental cost per QALY gained with exemestane treatment compared with tamoxifen was EUR 17,632.

The results of the sensitivity analysis showed that, at a willingness-to-pay threshold of EUR 25,000 per QALY, the probability that exemestane would be cost-effective was 80%.

Authors' conclusions
The authors concluded that switching to exemestane was likely to be cost-effective, compared with continuing tamoxifen, for the adjuvant treatment of early-stage breast cancer in the German health care setting.

CRD commentary
Interventions:
The treatments were well described and appear to have been appropriate comparators, including the usual care in the study setting. These are likely to be generalisable to other settings.

Effectiveness/benefits:
The effectiveness data were derived from one trial and its methods were not discussed, which means it is not possible to assess its quality. A search of published literature was not described and therefore it is not clear whether all the relevant evidence was included. The IES trial only provided effectiveness evidence for the first 36 months of the model and a conservative assumption of equal effectiveness was made for the remaining lifetime. The time horizon was lifetime, which should have captured the differences in health outcomes and costs. The methods used to derive the utility estimates were not stated, which makes it difficult to assess the QALY estimates.

Costs:
The authors stated that the perspective was that of the German Statutory Health Insurance and those costs relevant to this perspective appear to have been included. The sources for the cost estimates were relevant to the study population and were fully referenced. Future costs were discounted appropriately, but adjustments for inflation and the price year were not mentioned; the sources for the costs were from 2004 or 2005.

Analysis and results:
The analytic approach was well reported and the model structure was presented in a series of diagrams. The results were reported clearly and in full. Appropriate sensitivity analyses were performed to assess the full impact of the uncertainty in the parameter estimates on the results. The authors discussed the limitations of their study.

Concluding remarks:
The methods were good, but there was a lack of information on the effectiveness data, which makes it unclear if the authors' conclusions are appropriate.
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