The cost-effectiveness of hormone therapy in younger and older postmenopausal women
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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 compared the cost and effectiveness of hormone replacement therapy in postmenopausal women, aged 50 years or 65 years. The authors concluded that hormone replacement therapy in younger cohorts of postmenopausal women increased QALYs and was cost-effective. However, treatment in older women was associated with an initial reduction in QALYs for several years before an increase in QALYs was realized. Despite the limited reporting of some clinical data, the methods appear to have been valid and the authors’ conclusions appear to be appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
This study evaluated the cost-effectiveness of hormone replacement therapy in healthy younger (50 years old) and older (65 years old) postmenopausal women.

Interventions
The intervention was hormone replacement therapy, with no therapy as the comparator. Hormone therapy consisted of oestrogen or oestrogen-progesterone.

Location/setting
USA/primary care.

Methods
Analytical approach:
A state transition model of the ongoing risk of death, from several diseases, was used. The intervention changed the probabilities of having each disease. The time horizon was the patient's lifetime and treatment was received for 15 years. The authors reported that a societal perspective was adopted.

Effectiveness data:
The effectiveness data were mainly derived from published observational studies or randomised trials. The primary clinical outcomes were the relative risks, with or without therapy, of diseases, such as breast cancer, pulmonary embolism, cardiovascular events, colon cancer, and hip fracture.

Monetary benefit and utility valuations:
The utility scores for each health state were a combination of an age-adjusted utility score, a disease-state utility score, and the relative utility for hormone therapy. All the utilities were from published sources.

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

Cost data:
The economic analysis included the cost of cardiovascular events, hip and vertebra fractures, breast and colon cancer, pulmonary embolism, and hormone therapy. The annual summary costs were reported for each category. These were from various published studies. Average wholesale prices were used for the medication costs, and these were from official national sources. All costs were adjusted for inflation and were reported in US dollars ($) for the price year.
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Analysis of uncertainty:
The parameter uncertainty was investigated in a probabilistic sensitivity analysis, using Monte Carlo simulations. A deterministic one-way sensitivity analysis was also used on all the model parameters. A worst-case scenario, where therapy had its least benefit, highest cost, and most risk, was also tested. The treatment duration was varied, from five to 30 years for the younger cohort and five to 15 years for the older cohort, and the use of oestrogen only was also tested.

Results
In the younger cohort, the expected QALYs were 15.65 with therapy and 14.15 without it, while in the older cohort they were 9.42 with therapy and 9.31 without. In the younger cohort, the total costs per person were $18,485 with therapy and $14,849 without. In the older cohort, they were $22,112 with therapy and $19,139 without.

Compared with no therapy, hormone therapy resulted in an incremental cost of $2,438 per QALY gained in the younger cohort and $27,953 per QALY gained in the older cohort.

For the younger cohort, the results were robust to all variations tested in the sensitivity analysis apart from the worst-case scenario, where therapy had an incremental cost of $27,866 per QALY gained. For the older cohort, the results were most sensitive to variation in the cardiovascular risk, fracture risk, and treatment duration.

Authors’ conclusions
The authors concluded that hormone replacement therapy in younger cohorts of postmenopausal women increased QALYs and was cost-effective. However, treatment in older women was associated with an initial reduction in QALYs for several years before an increase in QALYs was realized.

CRD commentary
Interventions:
The rationale for the intervention was reported, but the intervention was not described in detail (specific medications, doses, etc.).

Effectiveness/benefits:
A review of the literature was conducted, but few search methods were reported, so it was not clear if the search was systematic. The references for the studies used were given. Randomised control trials were used, where appropriate. Little information was provided on the methods used to derive the utilities. QALYs are a validated and appropriate measure of benefit and they allow cross-disease comparisons.

Costs:
The authors reported that a societal perspective was adopted, but indirect costs were not included. The costs were only reported as category totals, without separate unit costs and resource quantities, which limits the transparency of the cost analysis. Inflation adjustments, the price year, and discounting were all adequately reported.

Analysis and results:
The model structure was presented in a diagram, with some of the modelling assumptions and the reader was referred to an online appendix for further details. The synthesis of the costs and benefits was appropriately carried out, in an incremental analysis, and the results were satisfactorily presented. The issue of uncertainty was thoroughly investigated in a deterministic and a probabilistic approach and the results were clearly reported. The authors briefly discussed some of the limitations of their study, which mainly related to the effectiveness data and the assumptions made.

Concluding remarks:
Despite the limited reporting of some clinical data, the methods appear to have been valid and the authors’ conclusions appear to be appropriate.
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