An economic evaluation of early assessment for Alzheimer's disease in the United Kingdom

Getsios D, Blume S, Ishak KJ, MacLaine G, Hernandez L

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 of the study was to evaluate the cost-effectiveness of early assessment and treatment for Alzheimer's disease compared with treatment after diagnosis or no treatment. The authors concluded that there were substantial benefits to a programme of early assessment and treatment. The quality of the study methods was satisfactory. The results were well reported. However, the effectiveness and cost data were reported poorly, making it difficult to assess the appropriateness of the authors’ conclusions.

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

Study objective
The objective was to evaluate the cost-effectiveness of early assessment and treatment for Alzheimer's disease.

Interventions
Early assessment and treatment for Alzheimer's disease with donepezil (10mg) was compared with scenarios where patients were either treated when diagnosed with Alzheimer's disease (without early assessment) or where patients remained untreated after diagnosis of Alzheimer's disease.

Location/setting
UK/Primary care

Methods
Analytical approach:
A discrete-event simulation was used to combine evidence from a combination of different sources to estimate the cost-effectiveness of early assessment and treatment of Alzheimer's disease. The time horizon of the analysis was 10 years. The authors stated that they included a health care payer perspective and a societal perspective.

Effectiveness data:
The effectiveness data came from seven donepezil clinical trials, two open-label extension studies, and data from the CERAD (Consortium to Establish a Registry for Alzheimer's disease) registry. Mortality estimates were taken from the Medical Research Council's Cognitive Function and Ageing Study. The main clinical effectiveness estimates were the progression of Alzheimer's disease and treatment effectiveness.

Monetary benefit and utility valuations:
Utility values were estimated using a regression equation from a published study. This regression equation combined patient characteristics and whether they were institutionalised or living with their caregiver to estimate a utility for patients.

Measure of benefit:
The benefit measure was quality adjusted life years (QALYs), which was discounted at an annual rate of 3.5%.

Cost data:
The cost categories included in the analysis included the cost of donepezil (10mg), the cost of biannual physician visits, the direct costs of patient care and the indirect costs of caregiver time. These costs were estimated based on British National Formulary prices, UK Unit Costs of Health and Social Care, and a Dementia UK report. The cost of caregiver
time was based on a regression of severity and time required using UK minimum wage data. The price year was 2007. Costs were reported in UK £, discounted at an annual rate of 3.5%.

Analysis of uncertainty:
One-way sensitivity analyses were carried to assess uncertainty in the input parameters. A probabilistic sensitivity analysis was performed to assess the impact of multiple and simultaneous parameter uncertainty on results. The results of the probabilistic sensitivity analyses were presented in cost-effectiveness acceptability curves.

Results
The total cost per patient of early assessment and treatment for Alzheimer’s disease was estimated to be £204,561 from a societal perspective and £108,505 from a health payer perspective, compared with £209,837 (societal) and £110,640 (health payer) for treatment without early assessment, or £212,302 (societal) and £112,098 (health payer) for no early assessment or treatment.

The mean QALYs (for the patient and caregiver/societal perspective) of early assessment and treatment were estimated to be 5.75 (1.94 patient/health payer perspective) compared with 5.56 (societal) for no early assessment or treatment (1.76 health payer), or 5.61 (societal) for treatment without early assessment (1.81 health payer).

Early assessment and treatment for Alzheimer’s disease was estimated to be dominant (less costly and more effective) than either of the alternative strategies. Probabilistic sensitivity analyses found that the early assessment strategy was cost-effective in 40% of its replications from the health care payer perspective and 70% of its replications from the societal perspective.

Authors’ conclusions
The authors concluded that there were substantial benefits in patient and economic outcomes for a programme of early assessment and treatment of Alzheimer’s disease.

CRD commentary
Interventions:
The interventions were well described and appeared to be appropriate comparators. Current practice in the study setting was appropriately included.

Effectiveness/benefits:
The methods used to identify relevant studies from the published literature were not described in detail; the authors did not describe the methods used to the select studies from which the data was derived. The methods used to analyse data from the disease registry to account for confounding were not presented. No details of the sample size or the follow-up period were provided. Therefore, it was difficult to assess the quality of the data included in the study or whether all the relevant available evidence was included.

The benefit measure seemed appropriate, as QALYs incorporated both the morbidity and mortality of patients. Although the utilities were estimated using a regression equation from a published study, the underlying methodology supporting the estimation of utilities was not provided, so it was difficult to assess the calculation of QALYs.

Costs:
The authors presented the analysis from two perspectives, societal and health care payer. The study appeared to include all the relevant costs from a health care payer perspective. Productivity costs associated with caregivers were included as part of a societal perspective, but no productivity costs of the patients were included in the analysis, so the study may have underestimated the societal costs. The sources of cost data were provided, but some of the supporting methodology was not fully described which made it difficult to assess the appropriateness of estimates used. The cost data was derived from sources which appeared to be highly relevant to the study setting. The costs were appropriately discounted and adjusted for inflation.

Analysis and results:
The analytical approach appeared appropriate and was adequately described, including a flow chart of the simulation. The use of an incremental analysis was appropriate to explore the relative cost-effectiveness the three
treatment/assessment options. Both deterministic and probabilistic sensitivity analyses were conducted, which provided a thorough assessment of the impact on results of uncertainty in the key parameters. The results of the base-case and sensitivity analysis were clearly presented. The authors discussed a number of limitations with their study in detail.

Concluding remarks:
The quality of the study methods was satisfactory. The results were well reported. However, the effectiveness and cost data were poorly reported, making it difficult to assess the appropriateness of the authors’ conclusions.

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