Health Technology Assessment 1998; Vol. 2: No. 4 (Executive summary)

Executive summary

A cost–utility analysis of interferon beta for multiple sclerosis

D Parkin[1]
P McNamee[1]
A Jacoby[1]
P Miller[1]
S Thomas[2]
D Bates[3]

[1] School of Health Sciences, University of Newcastle-upon-Tyne, UK
[2] Department of Pharmacological Sciences, University of-Newcastle-upon-Tyne, UK
[3] Department of Clinical Neurology, University of Newcastle-upon-Tyne, UK

Health Technology Assessment
NHS R&D HTA Programme

Executive summary

Background

The theory that multiple sclerosis (MS) may be caused by an autoimmune response led to experiments with the use of interferons, which are naturally occurring proteins that have immune-modifying properties. Clinical trials have now established that interferon beta preparations do have some effect in reducing MS disease activity. This report details a cost–utility analysis of interferon beta-1b (IFβ-1b) which, at the time this study was commissioned, was the only interferon preparation licensed for use in MS in the UK.

Objectives

- To identify to what extent IFβ-1b generates quality of life (QOL) gains.
- To measure and value QOL gains.
- To assess the net costs to the health service and society associated with IFβ-1b.
- To compare net costs and QOL gains in a cost–utility model.

Methods

Data collection

Data were collected from existing trials of IFβ-1b and from information on the natural history of MS. New data were collected on costs and QOL from a sample of people in England with relapse-remitting multiple sclerosis (RRMS), divided into two groups: those who had had a relapse in the last 6 months (n = 40) and those who had not (n = 62). Half of each group also took part in a utility measurement exercise.

Data analysis using models

The project involved the construction of a cost-effectiveness model for IFβ-1b for RRMS, which was tested using sensitivity analysis.

Main outcome measures

The following outcomes were used in the data analysis:

- differences in QOL between groups of patients with MS and compared with the general population, using the Multiple Sclerosis Quality of Life (MSQOL-54) and EQ-5D measures
- differences in costs between groups of patients with MS
- estimated changes in QOL and costs arising from IFβ-1b therapy
- cost per relapse avoided
- cost per quality-adjusted life year (QALY) gained.

Results

Quality of life

The impact of MS on QOL is measurable.

- Relapse and remission groups both had poorer QOL than the general population either with or without long-standing illness. However, their valuations of health states were higher than those of the general population.
- The relapse group had poorer QOL than the remission group. In addition, the effects of a relapse may continue over several months.
- Worse health states, as identified by the usual MS clinical measure (EDSS), were associated with poorer QOL.
- Few patients experienced symptom-free days over 6 weeks.
- Patients with worse EDSS status reported more symptoms.

Costs

NHS costs were higher in the relapse group than in the remission group, and the higher the EDSS score, the greater the costs in remission. Cost savings due to relapse rate reduction and slower progression associated with the use of IFβ-1b are small compared with its costs.

Cost-effectiveness and cost–utility

Using current information, the best estimate of cost-effectiveness over 5 years was £28,700 per relapse avoided, giving a cost–utility ratio of £809,900 per QALY gained. Allowing for possible, though unconfirmed effects on progression over 5 and 10 years produced cost–utility ratios of £328,300 and £228,300, respectively, per QALY gained. The estimates are robust to changes in assumptions; the most optimistic estimate was £74,500 per QALY gained. Other drug therapies

currently being tested are likely to have levels of cost-effectiveness similar to IFβ-1b.

Conclusions

IFβ-1b produces important occasional short-term gains in QOL to people with RRMS, but these translate into only small gains in QALYs overall. Even with optimistic estimates of longer-term gains the aggregate QALY gains are small. These benefits are achieved only with a large additional cost.

Implications for policy

Prescribing and policy decisions need to be taken on the basis of judgement at a number of different levels, and the results of the study may be helpful to those making these decisions. Patients and clinicians might consider the true extent of the gains in QOL produced by IFβ-1b in the light of the alternatives for improving QOL. Health Authorities have also to consider whether the extra investment required is worthwhile compared with the gains that health care produces for people with other conditions, bearing in mind both efficiency, as indicated by the cost–utility figures, and also equity.

Implications for research

The impact of MS on QOL is substantial and measurable and may not have been measured well by conventional outcome measures. Future studies of MS and of the impact of MS therapies should base outcomes measurement on QOL. Trial data also need to link closely with natural history and cost data. Valuation of problem-specific health utilities in MS is possible and helpful, but raises the issue of which values should be used in an economic evaluation.

Publication

Parkin D, McNamee P, Jacoby A, Miller P, Thomas S, Bates D. A cost–utility analysis of interferon beta for multiple sclerosis. *Health Technol Assessment* 1998; **2**(4).

NHS R&D HTA Programme

The overall aim of the NHS R&D Health Technology Assessment (HTA) programme is to ensure that high-quality research information on the costs, effectiveness and broader impact of health technologies is produced in the most efficient way for those who use, manage and work in the NHS. Research is undertaken in those areas where the evidence will lead to the greatest benefits to patients, either through improved patient outcomes or the most efficient use of NHS resources.

The Standing Group on Health Technology advises on national priorities for health technology assessment. Six advisory panels assist the Standing Group in identifying and prioritising projects. These priorities are then considered by the HTA Commissioning Board supported by the National Coordinating Centre for HTA (NCCHTA).

This report is one of a series covering acute care, diagnostics and imaging, methodology, pharmaceuticals, population screening, and primary and community care. It was identified as a priority by the Pharmaceutical Panel.

The views expressed in this publication are those of the authors and not necessarily those of the Standing Group, the Commissioning Board, the Panel members or the Department of Health. The editors wish to emphasise that funding and publication of this research by the NHS should not be taken as implicit support for the recommendations for policy contained herein. In particular, policy options in the area of screening will, in England, be considered by the National Screening Committee. This Committee, chaired by the Chief Medical Officer, will take into account the views expressed here, further available evidence and other relevant considerations.

Series Editors: Andrew Stevens, Ruairidh Milne and Ken Stein
Assistant Editor: Jane Robertson

The editors have tried to ensure the accuracy of this report but cannot accept responsibility for any errors or omissions. They would like to thank the referees for their constructive comments on the draft document.

Copies of this report can be obtained from:

The National Coordinating Centre for Health Technology Assessment,
Mailpoint 728, Boldrewood,
University of Southampton,
Southampton, SO16 7PX, UK.
Fax: +44 (0) 1703 595 639 Email: hta@soton.ac.uk
http://www.soton.ac.uk/~hta ISSN 1366-5278