View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by Elsevier - Publisher Connector

PRM81

COST-EFFECTIVENESS ANALYSIS OF DELAYED-RELEASE DIMETHYL-FUMARATE IN THE TREATMENT OF RELAPSING-REMITTING MULTIPLE SCLEROSIS IN ITALY

Furneri G[1], Santoni L[2], Marchesi C[3], Iannazzo S[4], Cortesi P[5], Piacentini P[4], Caputi A[6], Mantovani LG[4]

[1]CHARTA Foudation, Milano, Italy, [2]Biogen, Milan, Italy, [3]Biogen Spa, Milan, Italy, [4]CESP - Center for Public Health Research, University of Milan Bicocca, Milano, Italy, [5]CESP - Center for Public Health Research, University of Milan Bicocca, Monza, Italy, [6]University of Messina, Messina, Italy

OBJECTIVES: To compare cost-effectiveness of delayed-release dimethyl-fumarate (DMF; also known as gastro-resistant DMF) vs. pharmacological alternatives indicated for the first-line treatment of relapsing-remitting multiple sclerosis (RRMS), adopting the perspective of the Italian National Healthcare Service (NHS). **METHODS:** A cost-effectiveness model was used to evaluate costs and outcomes of patients treated with DMF, vs. interferon beta-1a intramuscular (IFN beta-1a, IM), interferon beta-1a subcutaneous, at two different doses (IFN beta-1a, SC 22mcg and SC 44mcg), interferon beta-1b subcutaneous (IFN beta-1b, SC), glatiramer acetate subcutaneous (GA), and oral teriflunomide (TER). The Markov model used for the analysis evaluated the effects of disability progression, relapses, and treatment-related adverse events, on direct healthcare costs and quality adjusted survival of RRMS patients, over a 50-year (lifetime) horizon. Comparative effectiveness and safety data used in the model were derived from a mixed treatment comparison. All unit tariffs and costs were adapted to the Italian setting. **RESULTS:** Lifetime direct healthcare costs associated with DMF were €276,500 per patient, yielding to 19.50 life-years (LYs) and 6.55 quality-adjusted LYs (QALYs). The incremental cost-effectiveness ratio (ICER) of DMF vs. the analyzed alternatives ranged between €11,272 per QALY gained (DMF vs. IFN-beta 1b SC) to €23,409 per QALY gained (DMF vs. TER). DMF was dominant vs. IFN-beta 1a SC 44mcg. Probabilistic sensitivity analysis conducted on both clinical and economic data showed that likelihood for DMF of being cost-effective, using a willingness-to-pay (WTP) threshold of €50,000 per QALY gained, was between 70.0% (DMF vs. TER), and 92.8% (DMF vs. IFN-beta 1b, SC). **CONCLUSIONS:** At the current pricing and reimbursement conditions established by the Italian NHS, DMF represents a cost-effective option vs. first-line treatments indicated in RRMS. ICER associated with DMF is much lower than the €50,000 per QALY gained value, the cost-effectiveness of dialysis, commonly used in Italy as benchmark to issue positive funding recommendation.

PRM82

IMPACT OF UNCERTAINTY IN PREDICTED RISKS ON THE COST-EFFECTIVENESS OF RISK-STRATIFIED PREVENTIVE TREATMENT STRATEGIES

van Giessen A[1], Piebes M[1], Koffijberg H[2]

[1]University Medical Center Utrecht, Utrecht, The Netherlands, [2]University of Twente, Enschede, The Netherlands

OBJECTIVES: We demonstrate an approach to assess the impact of uncertainty in risk predictions on health-economic outcomes in risk-stratified prevention strategies, illustrated for preventive statin treatment based on 10-year coronary heart disease (CHD) risk predicted by the Framingham risk score (FRS). **METHODS:** We refitted the FRS to three random samples of increasing size (N=2,500, N=1,000, N=500) from a population-based cohort. A Markov decision-analytic model was used to simulate cohorts with preventive statin treatment in high-risk (FRS≥20%) individuals (ATPIII guideline). This treatment threshold was incrementally lowered to T=0.0% with 0.5% decrements. Using the cohort the distribution of individuals over the low (<0.5T%), intermediate (0.5T%-T%), and high (≥T%) risk category and corresponding observed CHD-risks were calculated. The Net Health Benefit (NHB) (willingness-to-pay of $50,000/QALY) was calculated and uncertainty in outcomes was assessed with probabilistic sensitivity analysis. The NHB for each 0.5% risk category was calculated to assess the impact of risk prediction uncertainty on associated uncertainty in NHB. **RESULTS:** Prediction model performance was fair in all samples (c-statistic: 0.70-0.75). Prediction uncertainty resulted in probabilities of incorrect treatment decisions of up to 0.4 (N=2,500) and 0.5 (N=500) for risk around T=20.0%. The NHBs per risk category ranged from -0.031 for a predicted risk of [3.5%;4%] to 0.020 for [10.0%;10.5%] in men and from -0.067 at [0.0%;0.5%] to 0.045 for [2.0%;2.5%] in women. The NHB was positive for predicted risks >12.5% in men and >11.5% in women. For individuals with predicted risks <7.5% or >20%, in 95% of PSA simulations the NHB was negative or positive, respectively. **CONCLUSIONS:** Risk-stratified prevention is increasingly recommended. While uncertainty in risk predictions may lead to incorrect treatment decisions, associated impact on long-term health-economic outcomes is unknown. Assessing this impact can guide studies aiming to improve prediction models by focusing on individuals for which improvement may actually improve health-economic outcomes.

PRM83

CHALLENGES TO THE ECONOMIC MODELLING OF MACULAR OEDEMA DUE TO RETINAL VEIN OCCLUSION AND DIABETES

Almond C, Brereton N

BresMed, Sheffield, UK

OBJECTIVES: To identify and summarise challenges to the economic modelling of macular oedema due to retinal vein occlusion (RVO) and diabetic macular oedema (DMO). **METHODS:** National Institute for Health and Care Excellence (NICE) technology appraisals (TAs) for RVO and DMO published before 1 June 2015 were reviewed to identify areas of uncertainty in submitted economic models. Evaluations were compared to assess whether, over time, these uncertainties have been addressed. **RESULTS:** Three completed NICE TAs were identified for RVO and two for DMO. The main area of uncertainty identified related to whether patients would be treated in their better-seeing eye (BSE), worse-seeing eye (WSE) or both eyes (bilateral), and consequently how this should be modelled. This had implications for the appropriate application of utility estimates for patients treated in the BSE, WSE or bilaterally and for the classification of patients as blind. Blindness is associated with high costs and low quality of life, which were incorrectly accounted for in one-eye models. Other areas of uncertainty included the relevance of the unlicensed comparator bevacizumab, the frequency and duration of treatment, and the extrapolation of visual acuity beyond short-term observed trial data. The trial evidence used ranged from 6 months to 3 years and included evidence for treatment in one eye only. Most TAs modelled one treated eye only, with crude adjustments applied to account for bilateral treatment. Only the most recent appraisal for aflibercept in central RVO modelled the visual acuity of both eyes. All other uncertainties were consistent throughout the identified TAs. **CONCLUSIONS:** The main uncertainties are in which eye(s) patients are treated in practice and the extrapolation of outcomes beyond trial data. Modelling is limited by short-term clinical trial evidence that provides evidence for the treatment of one eye only.

PRM84

THE IMPORTANCE OF ACCOUNTING FOR BASELINE HYPOGLYCAEMIA FREQUENCY WHEN MODELLING HYPOGLYCAEMIA DISUTILITY IN TYPE 1 DIABETES MELLITUS

McEwan P[1], Lamotte M[2], Foos V[3]

[1]Health Economics and Outcomes Research Ltd, Monmouth, UK, [2]IMS Health, Vilvoorde, Belgium, [3]IMS Health, Basel, Switzerland

OBJECTIVES: Standard approaches to evaluating the health economic benefit of avoiding hypoglycaemia often attribute a per-event disutility (PED) with growing evidence of the diminishing marginal effects (DME) of hypoglycaemia on utility as frequency increases. This study compared PED to DME on predicted quality adjusted life expectancy (QALE). **METHODS:** This study used the CORE Diabetes Model (CDM) and published audit data for patients with type 1 diabetes switching to insulin degludec (ID) from either insulin glargine or detemir (IGD). Mean (± SD) baseline profiles were age 35.0 years (± 11.4); diabetes duration 18.2 years (± 7.5); HbA1c 9.4% (±0.8); weight 77.0 kg (±10.7) and 3.9 hypoglycaemia (severe and non-severe) events per week (±0.9). Mean change in clinical variables was HbA1c -0.5% (±0.3); weight +0.8g (±1.6) and hypoglycaemia events/week -3.6 (±0.9). A baseline cohort was projected over a lifetime using the CDM using published PED disutility (-0.0052) and published DME disutility (0.0141*[number of events]^0.3393) with and without treatment effects applied to calculate life expectancy (LE) and QALE associated with the pre and post-switch profiles. Results were discounted at 3.5%. **RESULTS:** Overall discounted LE was 18.8 years and 19.06 years for IGD and ID profiles respectively and discounted QALE (ignoring the impact of hypoglycaemia) was 12.13 and 12.4 for IGD and ID respectively. Discounted QALE was reduced by 1.85 (IGD) and 0.849 (ID) using the DME approach applied to hypoglycaemia rates of 3.9 and 0.4 events/week respectively. Using the PED approach discounted QALE was reduced by 22.96 (IGD) and 2.355 (ID). The PED approach resulted in a QALE prediction less than zero for IGD. **CONCLUSIONS:** Failure to adequately accommodate the relationship between hypoglycaemia frequency and utility within health economic evaluations may lead to misleading predictions and estimates of QALE that lack face validity; particularly when hypoglycaemia rates are high.

PRM85

VALIDATING APPROACHES TO MODELLING END-STAGE RENAL DISEASE USING THE IMS CORE DIABETES MODEL

McEwan P[1], Foos V[2], Lamotte M[3]

[1]Health Economics and Outcomes Research Ltd, Monmouth, UK, [2]IMS Health, Basel, Switzerland, [3]IMS Health, Vilvoorde, Belgium

OBJECTIVES: End-stage renal disease (ESRD) poses a significant burden to both patients and healthcare systems. In patients with type 2 diabetes mellitus (T2DM) improvements in the management of cardiovascular (CV) risk factor management has reduced CV specific morbidity and mortality. Consequently, as patients live longer with T2DM it is likely that the incidence and prevalence of renal disease will increase over time. The objective of this study was to externally validate the renal specific disease progression rates used in the IMS CORE diabetes model (CDM) to the UKPDS 64 and UK clinical practice. **METHODS:** A Markov state transition model was developed to predict the progression of renal disease populated with transition probabilities from the CDM (derived from US and Israeli published studies) and the UKPDS 64 nephropathy model. Time to ESRD and the cumulative percentage with ESRD at 10, 20 and 40 years, or lifetime, whichever occurred first, were compared and contrasted with published ESRD projections derived from UK clinical practice data (The Health Improvement Network [THIN]). Baseline patient characteristics were taken from published THIN data. **RESULTS:** For T2DM subjects aged 51 with mean systolic blood pressure of 139mmHg and HbA1c of 8% the predicted time to ESRD was 23.39 and 24.02 years when using CDM and UKPDS 64 transition rates, respectively. The cumulative incidence of ESRD at 10, 20 and 40 years was 2.21%, 10.04% and 24.96% respectively with CDM and 3.29%, 9.88% and 26.73% with UKPDS 64. Predicted 20-year cumulative risk of ESRD from THIN varied between 5-18% dependent upon cohort characteristics, consistent with output from both CDM (10.04%) and UKPDS (9.88%). **CONCLUSIONS:** This study provides evidence of the consistency between approaches to modelling renal disease employed by the CDM and reported from UKPDS; furthermore, both approaches provide estimates consistent with data from UK clinical practice.

PRM86

ADAPTING LITERATURE-BASED REMISSION RATES FOR CHRONIC SPONTANEOUS/IDIOPATHIC URTICARIA TO THE NEEDS OF A HEALTH ECONOMIC MODEL: A KAPLAN-MEIER APPROACH

Partha G[1], Gupta S[1], Bhattacharyya S[1], Halliday A[2], McBride D[3], Graham J[4], Balp M[5], Marsland A[6]

[1]Novartis Healthcare Pvt. Ltd., Hyderabad, India, [2]Novartis Pharmaceuticals UK Limited, Surrey, UK, [3]RTI Health Solutions, Manchester, UK, [4]RTI Health Solutions, Research Triangle Park, NC, USA, [5]Novartis Pharma AG, Basel, Switzerland, [6]The University of Manchester, Salford Royal Hospital, Salford, UK

OBJECTIVES: Remission, the spontaneous resolution of symptoms among patients, is one of the characteristics of chronic spontaneous (or idiopathic) urticaria (CSU/CIU). Limited literature currently exists regarding remission rates among chronic urticaria (CU) or CSU/CIU patients and available estimates vary. Due to the requirements