



Published Articles – Health Economics

How far do you go? Efficient searching for indirect evidence

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Medical Decision Making, 2009, 29

ABSTRACT

BACKGROUND: Indirect evidence is particularly valuable in health care decision making when direct trial evidence comparing relevant treatments is absent or limited. Current approaches using a predetermined set of comparators in the search query may fail to identify all relevant indirect evidence.

PURPOSE: To present a framework for the efficient design of search strategies for identifying clinical trials providing indirect evidence for a treatment comparison.

FINDINGS: The authors present 2 search strategies that differ from traditional search strategies in using a series of iterative searches to identify the set of relevant comparators. In both, the comparators included in each search are determined by the results of previous searches. For a given number of searches, the strategies presented will find all indirect comparisons that include a certain number of comparators linking the treatments of interest. Methods of estimating the value of indirect evidence via a given number of comparators linking the treatments of interest are presented, thus allowing the burden of additional searching to be traded off against the likely impact of finding more distant comparisons. A practical illustration of the search strategies in the context of informing a network meta-analysis of second-line treatments for non-small cell lung cancer is presented.

CONCLUSIONS: The iterative strategies presented offer a means of identifying such evidence and allow the researcher to determine the optimal scope of the search by estimating the value of additional indirect evidence.

Fondaparinux versus Enoxaparin in non-ST-elevation acute coronary syndromes: short-term cost and long-term cost-effectiveness using data from the Fifth Organization to Assess Strategies in Acute Ischemic Syndromes Investigators (OASIS-5) trial

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American Heart Journal, 2009, 157(5)

ABSTRACT

BACKGROUND: The study aimed to compare the short-term costs and long-term cost-effectiveness of 2 antithrombotics, fondaparinux and enoxaparin, for non-ST-elevation acute coronary syndrome in the United States.

METHODS: It was based on a large randomized trial of 20,078 patients Fifth Organization to Assess Strategies in Acute Ischemic Syndromes Investigators [OASIS-5] comparing the therapies in these patients. In OASIS-5, fondaparinux patients had about half the rate of major bleeding 9 days after randomization and at least as good clinical outcomes (death,

myocardial infarction, major bleeding and stroke) after 6 months of follow-up. Health care resource use and clinical efficacy data from the trial were incorporated into a cost-effectiveness model as applied to a general US health care system both for the time horizon of the study (6 months) and over the longer term.

RESULTS: The 180-day cost analysis indicates that fondaparinux would generate a cost saving of \$547 per patient (95% CI \$207-\$924). Sensitivity analysis suggested that savings could vary between \$494 and \$733. When 180-day cost and clinical results were extrapolated to long-term cost-effectiveness, fondaparinux was dominant (less costly and more effective in terms of quality-adjusted life-years) under most scenarios.

CONCLUSIONS: Fondaparinux is a more cost-effective antithrombotic agent than enoxaparin in non-ST-elevation acute coronary syndrome. This is true across the range of event risks seen in OASIS-5

No study left behind: a network meta-analysis in non-small-cell lung cancer demonstrating the importance of considering all relevant data.

Value in Health, 2009, 12(6)

N Hawkins D A Scott B Woods N Thatcher

ABSTRACT

Objective: To demonstrate the importance of considering all relevant indirect data in a network meta-analysis of treatments for non-small-cell lung cancer (NSCLC).

Methods: A recent National Institute for Health and Clinical Excellence appraisal focussed on the indirect comparison of docetaxel with erlotinib in second-line treatment of NSCLC based on trials including a common comparator. We compared the results of this analysis to a network meta analysis including other trials that formed a network of evidence. We also examined the importance of allowing for the correlations between the estimated treatment effects that can arise when analysing such networks.

Results: The analysis of the restricted network including only trials of docetaxel and erlotinib linked via the common placebo comparator produced an estimated mean hazard ratio (HR) for erlotinib compared with docetaxel of 1.55 (95% confidence interval [CI] 0.72–2.97). In contrast, the network meta-analysis produced an estimated HR for erlotinib compared with docetaxel of 0.83 (95% CI 0.65–1.06). Analyzing the wider network improved the precision of estimated treatment effects, altered their rankings and also allowed further treatments to be compared. Some of the estimated treatment effects from the wider network were highly correlated.

Conclusions: This empirical example shows the importance of considering all potentially relevant data when comparing treatments. Care should therefore be taken to consider all relevant information, including correlations induced by the network of trial data, when comparing treatments.

Recombinant erythropoietin for chemotherapy-related anaemia: economic value and health-related quality-of-life assessment using direct utility elicitation and discrete choice experiment methods

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Pharmacoeconomics, 2007, 25

ABSTRACT

OBJECTIVE: To assess both the health-related quality of life (HR-QOL) and the economic value of erythropoietin treatment in chemotherapy-related anaemia using direct utility elicitation and discrete choice experiment (DCE) methods from a societal perspective in the UK.

METHODS: The time trade-off (TTO) method was employed to obtain utility values suitable for the calculation of QALYs for no, mild, moderate and severe anaemia. Health-state descriptions were developed using the Functional Assessment of Cancer Therapy - Anaemia (FACT-AN) subscale and the EQ-5D questionnaires, and were validated by clinical experts and patients. In addition, a DCE was implemented to elicit preferences for various anaemia treatment scenarios. The DCE analysis comprised important aspects of treatment identified from a literature review and by consultation with expert clinicians and cancer patients. The DCE included cost as an attribute in order to elicit willingness-to-pay (WTP) values (pound, 2004 values). The two methods were applied in the same cross-sectional sample of 110 lay people. Face-to-face interviews were conducted between February and March 2004.

RESULTS: The mean utility scores were 0.86 (standard error [SE] 0.014) for the no-anaemia state, and 0.78 (SE 0.016), 0.61 (SE 0.020) and 0.48 (SE 0.020) for the mild, moderate and severe anaemia states, respectively. The DCE results revealed the following preferences as significant predictors of choice: higher level of relief from fatigue, lower duration of administration, subcutaneous/intravenous administration versus cannula injection, GP versus hospital location, lower risk of infection or allergic reactions and lower cost per month to the patient. Attribute levels were valued higher for recombinant erythropoietin than for blood transfusion; this is reflected in an incremental welfare value of 368 pounds (95% CI 318, 419).

CONCLUSIONS: The results highlight a societal view that the severity of chemotherapy-related anaemia will significantly affect cancer patients' HR-QOL. The DCE survey shows that the public value favourably the attributes of treatment with recombinant erythropoietin, and indicates a likely patient preference for treatment with recombinant erythropoietin over blood transfusion.

Cost-effectiveness of salmeterol xinafoate/fluticasone propionate combination inhaler in chronic asthma

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Current Medical Research and Opinion, 2007, 23(5)

ABSTRACT

OBJECTIVE: To determine where in the treatment steps recommended by the British Thoracic Society and Scottish Intercollegiate Guidelines Network (BTS/SIGN) Asthma Guideline it is cost-effective to use salmeterol xinafoate/fluticasone propionate combination inhaler (SFC) (Seretide) compared with other inhaled corticosteroid (ICS) containing regimens (with and without a long acting beta-2 agonist (LABA)) for chronic asthma in adults and children.

RESEARCH DESIGN AND METHODS: Meta-analyses of percentage symptom-free days (%SFD) were used within a cost-effectiveness model. Time spent in two asthma control health states, 'symptom-free' and 'with-symptoms' was used as the measure of differential treatment effectiveness. SFC was compared with varying doses of fluticasone propionate (FP) and beclometasone dipropionate (BDP) with or without a separate salmeterol inhaler, and with the budesonide / formoterol combination inhaler (BUD/FORM) (Symbicort). Drug

costs, non-drug costs and quality adjusted life years (QALY) were incorporated into the analyses. Results are presented as cost per QALY ratios and uncertainty explored using probabilistic sensitivity analysis.

RESULTS: Compared with an increased dose of FP in adults, SFC either 'dominates' (i.e. cheaper and more effective) FP or the cost per QALY is 6852 pounds sterling. The cost per QALYs estimated in sensitivity analyses using BDP costs range from 5679 pounds sterling to 15,997 pounds sterling. For children the cost per QALY for SFC 50 Evohaler compared with an increased dose of FP is pound 15,739 pounds sterling. SFC is similarly clinically effective in improving %SFDs compared with FP plus salmeterol delivered in separate inhalers (mean differences for each dose comparison of -3.9 (low) (with a 95% confidence interval (CI): -12.96; 5.16); 4.10 (medium) (95% CI: -3.01; 11.21); -0.4 (high) (95% CI: -8.88; 8.08)) and BUD/FORM (mean difference of 0.40 (95% CI -3.69; 4.49)) in adults, and a cheaper SFC option is available at all doses (annual cost savings range from 18 pounds sterling-427 pounds sterling per patient). SFC was similarly effective compared with FP plus salmeterol in separate inhalers in children under 12 and also resulted in annual cost savings of between 47 pounds sterling and 77 pounds sterling. A number of other comparisons were also made and the results are available as electronic supplementary data.

CONCLUSIONS: This is the first analysis to estimate the cost-effectiveness of SFC in chronic asthma compared with multiple comparators and based on a systematic identification of relevant trials and data on %SFDs. The findings suggest that for adults and children uncontrolled on BDP 400 microg/day or equivalent it is a cost-effective option to switch to SFC (at an equivalent ICS dose) compared with increasing the dose of ICS. For adults and children aged 12 years and over who have passed this point and are uncontrolled on BDP 800 microg/day or equivalent, switching to SFC remains a cost-effective approach. Where an adult or child requires an ICS and a LABA to be co-prescribed, SFC is a cost-effective option compared with FP or BDP plus salmeterol delivered in separate inhalers. In adults who require combination therapy, SFC is a cost-effective option compared with BUD/FORM

Cost effectiveness of perindopril in reducing cardiovascular events in patients with stable coronary artery disease using data from the EUROPA study

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Heart, 2007, 93(9)

ABSTRACT

BACKGROUND: The European trial on Reduction Of cardiac events with Perindopril in stable coronary Artery disease (EUROPA) trial has recently reported. **OBJECTIVE:** To assess the cost effectiveness of perindopril in stable coronary heart disease in the UK.

METHODS: Clinical and resource use data were taken from the EUROPA trial. Costs included drugs and hospitalisations. Health-related quality of life values were taken from published sources. A cost-effectiveness analysis is presented as a function of the risk of a primary event (non-fatal myocardial infarction, cardiac arrest or cardiovascular death) in order to identify people for whom treatment offers greatest value for money.

RESULTS: The median incremental cost of perindopril for each quality-adjusted life year (QALY) gained across the heterogeneous population of EUROPA was estimated as 9700 pounds (interquartile range 6400-14,200 pounds). Overall, 88% of the EUROPA population had an estimated cost per QALY below 20,000 pounds and 97% below 30,000 pounds. For a threshold value of cost effectiveness of 30,000 pounds per QALY gained, treatment of people representing the 25th, 50th (median) and 75th centiles of the cost effectiveness

distribution for perindopril has a probability of 0.999, 0.99 and 0.93 of being cost effective, respectively. Cost effectiveness was strongly related to higher risk of a primary event under standard care.

CONCLUSIONS: Whether the use of perindopril can be considered cost effective depends on the threshold value of cost effectiveness of healthcare systems. For the large majority of patients included in EUROPA, the incremental cost per QALY gained was lower than the apparent threshold used by the National Institute for Health and Clinical Excellence in the UK.

Modelling payback from research into the efficacy of left-ventricular assist devices as destination therapy

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International Journal of Technology Assessment in Health Care, 2007, 23

ABSTRACT

OBJECTIVES: Ongoing developments in design have improved the outlook for left-ventricular assist device (LVAD) implantation as a therapy in end-stage heart failure. Nevertheless, early cost-effectiveness assessments, based on first-generation devices, have not been encouraging. Against this background, we set out (i) to examine the survival benefit that LVADs would need to generate before they could be deemed cost-effective; (ii) to provide insight into the likelihood that this benefit will be achieved; and (iii) from the perspective of a healthcare provider, to assess the value of discovering the actual size of this benefit by means of a Bayesian value of information analysis.

METHODS: Cost-effectiveness assessments are made from the perspective of the healthcare provider, using current UK norms for the value of a quality-adjusted life-year (QALY). The treatment model is grounded in published analyses of the Randomized Evaluation of Mechanical Assistance for the Treatment of Congestive Heart Failure (REMATCH) trial of first-generation LVADs, translated into a UK cost setting. The prospects for patient survival with second-generation devices is assessed using Bayesian prior distributions, elicited from a group of leading clinicians in the field.

RESULTS: Using established thresholds, cost-effectiveness probabilities under these priors are found to be low (approximately .2 percent) for devices costing as much as 60,000 pounds. Sensitivity of the conclusions to both device cost and QALY valuation is examined.

CONCLUSIONS: In the event that the price of the device in use would reduce to 40,000 pounds, the value of the survival information can readily justify investment in further trials.

Resource utilization associated with irritable bowel syndrome in the United States 1987-1997

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Digestive Diseases and Sciences, 2002, 47(8)

ABSTRACT

This study uses national databases to examine the impact of irritable bowel syndrome (IBS) on resource utilization in the United States. Approximately 1.5-2.7 million physician visits (599-1,043 per 100,000) yearly were related to IBS, with 45.3% seen by gastroenterologists, and 89% prescribed medications. Rates of physician visits by women were approximately

2.4-3.3 times higher than that for men. The average number of medication prescribed per visit was 1.83. Approximately 89% of the visits were prescribed with medications. The rate of hospitalization (5.1 per 100,000 in 1997) decreased by 60% and length of stay decreased from 5.5 to 3.1 days in the past decade. The average charges of IBS-related hospitalization were US\$7,882. Our study found an apparent decreasing trend of IBS-related hospitalizations and no marked increase in office consultations in the past decade. However, a better case identification criterion is necessary to estimate the true disease burden.