Cost-effectiveness study of oral hypoglycemic agents in the treatment of outpatients with type 2 diabetes attending a public primary care clinic in Mexico City

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 aim was to evaluate the cost-effectiveness of the most common oral hypoglycaemic agents, for out-patients with type 2 diabetes, in a primary care, in Mexico. The authors concluded that glibenclamide was the most cost-effective treatment for patients who were newly diagnosed with type 2 diabetes. The methods and results were not well reported, making it hard to assess the authors’ conclusions.

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

Study objective
The objective was to evaluate the cost-effectiveness of the most common oral hypoglycaemic agents, for out-patients with type 2 diabetes, in primary care, in Mexico.

Interventions
The oral hypoglycaemic agents were metformin (maximum daily dose 2,550mg), glibenclamide (maximum daily dose 20mg), and acarbose (maximum daily dose of 300mg). Initial treatment was six months. When metformin or glibenclamide failed, treatment continued for six months with the addition of the other drug (maximum daily dose 1,700mg metformin plus 15mg glibenclamide).

Location/setting
Mexico/primary care.

Methods
Analytical approach:
A Markov model, with monthly cycles, was used to synthesise the data from an observational study and evidence from published literature. The time horizon was one year. The authors stated that the perspective of Mexican society (the public health sector) was adopted.

Effectiveness data:
The clinical effectiveness estimates were from a systematic review of the published randomised controlled trials, from 1980 to 2009, in four databases (PubMed, Scopus, The Cochrane Library, and MEDLINE). The main measure of clinical effectiveness was treatment success, which was defined as a glycated haemoglobin factor of 7% or less. This was estimated using a meta-analysis of trial data identified by the searches. The occurrence of non-serious adverse events with each treatment was included, based on the identified trials and published studies in The Cochrane Library.

Monetary benefit and utility valuations:
The utility valuation methods were not reported.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the measure of benefit.

Cost data:
The cost categories were the direct costs of medical visits and laboratory tests, and the treatments. The direct non-
medical costs, such as transport, were also assessed. The direct costs were from the Instituto Mexicano del Seguro Social's Federal Official Daily Gazette, for 2009. The indirect costs considered lost working days or hours, and lost income. All costs were based on a study of 27 patients with type 2 diabetes, at a primary care clinic, in Mexico City. The price year was 2009 to 2010. All costs were reported in US $, converted at a rate of 13.35 Mexican pesos to $1.

Analysis of uncertainty:
One-way sensitivity analyses were performed to assess the impact of parameter uncertainty, on the results, by varying the annual total costs by ±25%, and using the confidence intervals around the effectiveness estimates, obtained from the meta-analysis.

Results
The probability of treatment success was estimated to be 0.2315 for metformin, 0.2582 for glibenclamide, 0.2217 for acarbose, 0.2022 for glibenclamide plus metformin, and 0.2893 for metformin plus glibenclamide.

The total annual costs per patient were estimated to be $193 for metformin, $188 for glibenclamide, $246 for acarbose, and $210 for metformin plus glibenclamide.

The cost-effectiveness ratios were $296 per QALY for metformin, $273 per QALY for glibenclamide, and $410 per QALY for acarbose. The addition of metformin to glibenclamide was more cost-effective, than the addition of glibenclamide to metformin. The incremental cost-effectiveness ratios were $115 per QALY gained for glibenclamide versus metformin, and $642 for glibenclamide versus acarbose.

Authors’ conclusions
The authors concluded that glibenclamide was the most cost-effective treatment for patients who were newly diagnosed with type 2 diabetes.

CRD commentary
Interventions:
The interventions were well described, and it appears that the authors assessed different national and international therapeutic guidelines to identify the treatment options. It is likely that these options were applicable to other settings.

Effectiveness/benefits:
The identification of the effectiveness data was fully described, with the search terms and databases searched. The inclusion criteria were outlined, and appropriate methods were used to synthesise the data. Most of the effectiveness data were from randomised controlled trials, which should have had high validity. It is likely that the best available sources were used. The measurement of the utilities was not described, making it impossible to evaluate the estimation of the QALYs.

Costs:
The cost categories included the direct and indirect costs relevant to the perspective stated, except for the costs of any complications of treatment, which were omitted. The resource use was based on maximum tolerated doses, which might not be the same as clinical practice. The source for the direct cost data appears to have been appropriate for the Mexican setting, but the estimates were not fully reported. The indirect cost data were from a small observational Mexican study of 27 patients who had received metformin or glibenclamide. The sample was small and might not have been sufficient, and appropriate, for estimating the indirect costs. The total annual costs were the same for both combined therapies, even though they had different effectiveness, and this was not explained by the authors. The costs were converted from Mexican pesos to US $ using an exchange rate, but purchasing power parity might have been more appropriate.

Analysis and results:
An incremental approach was appropriate to assess the relative cost-effectiveness of the treatment options, but the authors did not report the results in full. It was unclear whether the one-year time horizon was sufficient to capture all the costs and effects, especially as surrogate outcomes (reduced glycated haemoglobin), with implied QALY gains, were used to define treatment success. The impact of uncertainty was addressed in univariate sensitivity analysis, which did not assess the overall impact of parameter uncertainty on the results. The authors did not discuss in detail any
limitations to their study.

Concluding remarks:
The methods and results were not well reported, making it hard to assess the authors’ conclusions.

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