Cost-effectiveness of treating hypertension, hyperglycemia, and hyperlipidemia in African Americans and the general population with type 2 diabetes

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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 was to assess the cost-effectiveness of aggressive treatment of hypertension, hyperglycaemia, and hyperlipidaemia, in an adult population of African Americans and the general population, both with type 2 diabetes. The authors concluded that their study highlighted the economic and health benefits of providing comprehensive diabetes care to all groups of patients, especially African Americans. There were some limitations in the reporting, which make it difficult to assess the validity of the authors' conclusions.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to assess the cost-effectiveness of aggressive treatment of hypertension, hyperglycaemia, and hyperlipidaemia, in an adult population of African Americans and in the general US population, both with type 2 diabetes.

Interventions
Aggressive treatment was compared with the usual care. Aggressive treatment included an angiotensin-converting enzyme inhibitor or a β-blocker for aggressive hypertension control; insulin or sulfonylurea for aggressive glycaemic control; a 40mg dose of pravastatin for aggressive treatment of hyperlipidaemia; and four physician visits. Usual care was the non-aggressive or inadequate management of risk factors for cardiovascular disease.

Location/setting
USA/the setting was not reported.

Methods
Analytical approach:
The economic evaluation was based on a Markov model, with a one-year cycle length, and a lifetime horizon. The authors stated that a health care perspective was adopted.

Effectiveness data:
The effectiveness data were derived from published studies. The main clinical parameters were the probability of experiencing various cardiovascular disease events.

Monetary benefit and utility valuations:
The health utilities were derived from published studies.

Measure of benefit:
The primary measure of benefit was the quality-adjusted life-year (QALY) and these were discounted at an annual rate of 3%.

Cost data:
The costs included drug and treatment costs for hypertension, hyperlipidaemia, and hyperglycaemia, and the costs of various cardiovascular events. The costs were from published studies and the Red Book. The price year was 2005 and
all costs were reported in US dollars ($). They were discounted at an annual rate of 3%.

**Analysis of uncertainty:**
A one-way sensitivity analysis was performed on the key model parameters.

**Results**
In the cohort of 50-year-old diabetic African Americans, the incremental cost of aggressive treatment compared with usual care was $71,959, the incremental QALYs gained were 3.11, and the cost per QALY gained was $23,148. In the cohort of 50-year-old diabetic members of the general population, the incremental cost of aggressive treatment compared with usual care was $82,168, the incremental QALYs gained were 2.33, and the cost per QALY gained was $35,213.

The results were most sensitive to the age at initiation of treatment, the treatment costs, and the discount rate. For example, the incremental cost-effectiveness ratio decreased with increasing age and increased with an increased discount rate.

**Authors' conclusions**
The authors concluded that their study highlighted the economic and health benefits of providing comprehensive diabetes care to all subgroups of patients, especially African Americans.

**CRD commentary**
**Interventions:**
The selection of the comparators appears to have been appropriate, but little detail was provided on the usual care.

**Effectiveness/benefits:**
The effectiveness data were derived from published studies, but the methods used to identify these studies were not reported, making it impossible to determine if the best available evidence was used. The effectiveness estimates were poorly reported, with no detail of the transition probabilities used in the model. There was some discussion of the standard gamble approach for estimating the utilities for health states, but it was unclear if this method was used in the studies from which the health utilities were derived.

**Costs:**
The included costs appear to have reflected the perspective stated. The cost analysis was poorly reported and only the total costs of treatment and events were stated. Adjustments for the price year and discounting were reported.

**Analysis and results:**
The authors conducted an appropriate incremental analysis and the full results were presented. A one-way sensitivity analysis was conducted and the results were discussed, but a probabilistic sensitivity analysis would have more thoroughly analysed the overall uncertainty in the model parameters. The authors discussed some limitations of their analysis, which included the assumption that all patients in the aggressive treatment group adhered to this treatment.

**Concluding remarks:**
There were some limitations in the reporting, which make it difficult to assess the validity of the authors' conclusions.

**Funding**
Not stated.

**Bibliographic details**

**PubMedID**
20173262

DOI
10.1353/hpu.0.0258

Original Paper URL

Indexing Status
Subject indexing assigned by NLM

MeSH
Adult; African Americans; Aged; Aged, 80 and over; Cohort Studies; Cost-Benefit Analysis; Diabetes Mellitus, Type 2 /economics /ethnology /therapy; Health Care Costs /statistics & numerical data; Healthcare Disparities; Humans; Hyperglycemia /economics /ethnology /therapy; Hyperlipidemias /economics /ethnology /therapy; Hypertension /economics /ethnology /therapy; Markov Chains; Middle Aged; Quality-Adjusted Life Years; Risk Factors; United States /epidemiology; Young Adult

AccessionNumber
22010000960

Date bibliographic record published
21/07/2010

Date abstract record published
27/10/2010