A French cost-consequence analysis of the renoprotective benefits of irbesartan in patients with type 2 diabetes and hypertension


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 study objective was to determine whether early irbesartan treatment of diabetic nephropathy would be more cost-effective than using irbesartan after overt nephropathy development. The authors concluded that their model supported early irbesartan treatment. The results of the study were reported in detail. However, as many of the methods had been published elsewhere, the authors reported only brief details of the methodology used. Consequently, it is difficult to determine the quality of the study and the validity of the authors' conclusions.

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

Study objective
The objective of the study was to determine whether treating diabetic nephropathy with irbesartan at an early stage would be more cost-effective than using irbesartan after overt nephropathy had developed.

Interventions
The interventions under study were:

control treatment, i.e. treatment with conventional antihypertensive medications including diuretics, β-blockers, alpha/beta-blockers, peripheral vasodilators and adrenergic blockers, and central adrenergic blockers;

early irbesartan treatment, i.e. the addition of irbesartan (300 mg/day) to the control medications, commenced when patients had microalbuminuria; and

late irbesartan treatment, i.e. the addition of irbesartan (300 mg/day) to the control medications, commenced when patients had overt nephropathy.

Location/setting
France/secondary care.

Methods
Analytical approach:
A published Markov model was used to simulate disease progression, death and costs (Palmer et al. 2004, see 'Other Publications of Related Interest' below for bibliographic details). The time horizon of the analysis was 25 years. The authors reported that the perspective adopted in the economic analysis was that of a third-party French social security insurance payer.

Effectiveness data:
The authors reported that details of the transition probabilities used in the model had been reported elsewhere (Palmer et al. 2004). Consequently, the authors provided no details on how these estimates were derived. Effectiveness estimates for the early and late interventions were derived from two clinical trials.

Monetary benefit and utility valuations:
The authors did not report the source from which utility values were obtained.

Measure of benefit:
The measures of benefit were the life-years gained and quality-adjusted life-years (QALYs).

Cost data:
The direct health care costs to an insurance payer were included in the analysis, which considered the annual costs of irbesartan, and the costs of transplant or dialysis due to end-stage renal disease. The authors did not provide the source from which the costs of irbesartan were derived. The cost estimates for transplant or dialysis were based on total third-party reimbursements and were derived from several sources, mainly published studies. The price year was 2002. All costs were reported in euros (EUR). Since the costs could be incurred over a 25-year time horizon, they were discounted at an annual rate of 3%.

Analysis of uncertainty:
A series of one-way sensitivity analyses was performed by varying the discount rate, time horizon, nephropathy progression and mortality risk.

Results
The average discounted life-years gained were 12.17 (standard deviation, SD=0.05) with early irbesartan, 11.27 (SD=0.01) with late irbesartan and 11.23 (SD=0.04) with the control treatment.

The average discounted QALYs gained were 10.55 (SD=0.06) with early irbesartan, 9.58 (SD=0.01) with late irbesartan and 9.52 (SD=0.01) with the control treatment.

The average costs were EUR 17,689 (SD=1,110) with early irbesartan, EUR 33,383 (SD=598) with late irbesartan and EUR 40,003 (SD=591) with the control treatment.

The costs and benefits were not combined as early irbesartan treatment was found to be dominant (i.e. more effective and less costly) than late irbesartan treatment or the control therapy.

The results from the sensitivity analyses showed that early irbesartan was cost- and life-saving under all assumptions tested, except for shorter time horizons, whereby the full impact on life expectancy of early irbesartan was not fully captured.

Authors’ conclusions
The authors concluded that their model supported the early use of irbesartan in patients with microalbuminuria, hypertension and Type 2 diabetes.

CRD commentary
Interventions:
Although the authors reported appropriate details of all the interventions under study, no explicit justification was given for using the control treatment as the comparator. In addition, the authors reported that, owing to the paucity of data, it was not possible to include angiotensin-converting enzyme inhibitors in the present analysis.

Effectiveness/benefits:
The structure and parameters of the model used to evaluate the cost-effectiveness of the three interventions had been published elsewhere. The authors therefore gave only very brief details of the clinical and effectiveness parameters included in the model. Consequently, it is not possible to judge whether all relevant evidence was considered.

Costs:
The authors reported the perspective adopted in the economic analysis but very few details of the cost parameters included. However, it would appear that all the relevant costs were included. Although the sources used to determine the costs of dialysis and transplantation were reported, those used to derive drug costs were not. The price year, time horizon and discount rate were all appropriately reported.
Analysis and results:
The author gave only very brief details of the model used to determine the costs and outcomes of the three interventions since it had been published elsewhere. The impact of uncertainty on the model results was assessed using one-way sensitivity analyses. Although this type of analysis goes some way towards dealing with uncertainty, a probabilistic sensitivity analysis would have been a more thorough way in which to capture the overall uncertainty within the model and its parameters. The authors highlighted the limitations of their study in their discussion.

Concluding remarks:
The results of the study were reported in full. However, as many of the methods had been published elsewhere, the authors only reported very brief details of the methodology used. As a result, it is difficult to determine the quality of the study and the validity of the authors' conclusions.

Funding
Bristol-Myers Squibb; Sanofi-Aventis.

Bibliographic details

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Albuminuria /complications /drug therapy; Angiotensin II Type 1 Receptor Blockers /administration & dosage /economics /therapeutic use; Biphenyl Compounds /administration & dosage /economics /therapeutic use; Cost-Benefit Analysis; Diabetes Mellitus, Type 2 /complications; Diabetic Angiopathies /complications /drug therapy; Diabetic Nephropathies /drug therapy /etiology /prevention & control; Disease Progression; Drug Administration Schedule; France; Health Care Costs; Humans; Hypertension /complications /drug therapy; Kidney Failure, Chronic /drug therapy; Markov Chains; Quality-Adjusted Life Years; Tetrazoles /administration & dosage /economics /therapeutic use; Treatment Outcome

AccessionNumber
22006002422

Date bibliographic record published
12/12/2006

Date abstract record published
23/12/2008