Economic evaluation of irbesartan in combination with hydrochlorothiazide in the treatment of hypertension in Greece

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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
This study assessed the cost-effectiveness of irbesartan compared with losartan or valsartan, given in combination with hydrochlorothiazide, for hypertensive patients aged 40 to 80 years, from the payer perspective. The authors concluded that irbesartan with hydrochlorothiazide compared favourably with losartan or valsartan with hydrochlorothiazide, for various populations of hypertensive patients, in Greece. The cost-effectiveness methods were valid and the authors’ conclusions appear to be robust.

Type of economic evaluation
Cost-utility analysis

Study objective
This study assessed the cost-effectiveness of irbesartan compared with losartan or valsartan, given in combination with hydrochlorothiazide, for hypertensive patients aged 40 to 80 years.

Interventions
The interventions were irbesartan, losartan, or valsartan, in combination with hydrochlorothiazide. The doses varied depending on the level of hypertension (mild, moderate, or severe).

Location/setting
Greece/primary and secondary care.

Methods
Analytical approach:
The analysis was based on a Markov model, with a lifetime horizon. The authors stated that the analysis was carried out from the payer perspective.

Effectiveness data:
The clinical inputs for the treatment effect, measured by a reduction in blood pressure, were identified by a systematic search of the MEDLINE database up to 2008. Only double-blind, randomised controlled trials (RCTs) that evaluated an angiotensin II inhibitor in combination with hydrochlorothiazide, compared with either placebo or another active treatment were considered. Where required, an indirect comparison was performed, considering the comparability of interventions and patient populations. Multiple results were pooled using the inverse variance method. Epidemiological data and other Greek population data were from large country-specific databases. The reduction in blood pressure and its relationship with the risk of developing cardiovascular disease were key inputs for the model. The association was based on published risk equations.

Monetary benefit and utility valuations:
The health utilities were from three published studies and authors’ assumptions.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the summary benefit measure and they were discounted at an annual rate of 3%.
Cost data:
The economic analysis included the annual costs of antihypertensive medication, the management and treatment of cardiovascular events, and the maintenance of patients following hospital discharge. The drug costs were from the latest price list from the Ministry of Commerce, while other costs were from a sample of 362 patients from the database of the National Insurance Fund. The price year was 2008. All costs were in Euros (EUR) and were discounted at an annual rate of 3%.

Analysis of uncertainty:
Various one-way sensitivity analyses were carried out on the model inputs, using ranges reported in the literature or based on authors’ opinions. Several subgroup analyses were conducted.

Results
In the base case for men with mild-to-moderate hypertension, the projected costs were EUR 15,146 with irbesartan, EUR 15,696 with losartan, and EUR 15,613 with valsartan. The QALYs were 12.67 with irbesartan, 12.63 with losartan, and 12.64 with valsartan. Irbesartan was dominant as it was less expensive and slightly more effective than the other options.

In all patient subgroups (mild-to-moderate with diabetes; mild-to-moderate with obesity; severe disease; severe disease with diabetes; and severe disease with obesity), irbesartan was dominant. Valsartan was not an option for severe disease.

Similar results were observed for women, with all costs lower and all QALYs higher than their corresponding male subgroups.

The sensitivity analyses showed that the discount rate and drug prices were the most influential inputs. Irbesartan was no longer less costly in some scenarios, but it remained the most effective option.

Authors’ conclusions
The authors concluded that irbesartan with hydrochlorothiazide compared favourably with losartan or valsartan with hydrochlorothiazide for various populations of hypertensive patients, in Greece.

CRD commentary
Interventions:
The selection of the comparators was appropriate as irbesartan was the proposed treatment and the comparators were the two most commonly prescribed anti-hypertension therapies in the authors’ setting. These are likely to be valid comparators in other settings. The authors stated that the three treatments accounted for about 50% of all antihypertensive use.

Effectiveness/benefits:
An appropriate approach was used to identify the relevant sources of evidence. The methods and conduct of the literature review were extensively reported and RCTs are generally considered to be robust sources of data. The key data on these trials were reported. The authors acknowledged that indirect comparisons were needed for some patient groups, given a lack of head-to-head trials. The statistical tests used to pool evidence from various sources were clearly described. Other data were appropriately from valid risk equations, large country-specific databases, or observational studies. The utility values were not available for Greek patients and were from studies carried out in other countries. Limited information on the derivation of the patient’s preferences for the health conditions was provided. QALYs were an appropriate and valid benefit measure given the impact of hypertension on both survival and quality of life.

Costs:
The economic analysis was conducted from the perspective of the payer and those costs borne by hospitals, insurance funds, or the national health system were included. These were reported for each health state and were split by hospital costs and those of other payers. The resource quantities and unit costs were only reported separately for the drugs. The sources for the unit costs appear to have been typical of the Greek setting. Most of the costs were varied in the sensitivity analysis. The price year and discounting were reported.
Analysis and results:
The results were extensively reported for all patient subgroups. An incremental analysis was used to identify the optimal treatment, but incremental cost-utility ratios were not calculated because of the superior clinical and economic profile of irbesartan. The uncertainty was investigated, using a deterministic approach that focused on individual inputs. A more comprehensive approach would have helped to demonstrate the robustness of the base-case findings. A strength of the analysis was the inclusion of several subgroups with different hypertensive risks and other characteristics. In all groups, the results were similar. This analysis might be transferable to other settings with similar epidemiological and cost data.

Concluding remarks:
The cost-effectiveness methods were valid and the authors’ conclusions appear to be robust.

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