**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 everolimus and mycophenolate mofetil compared with azathioprine for patients undergoing heart transplantation. The authors concluded that everolimus was more cost-effective than mycophenolate mofetil for patients after heart transplant. Overall, the methodology and results were presented clearly and valid sources of data were used. Due to the limits of the study design, the authors’ conclusions should be considered carefully.

**Type of economic evaluation**
Cost-effectiveness analysis

**Study objective**
The aim was to evaluate the cost-effectiveness of everolimus and mycophenolate mofetil compared with azathioprine for patients undergoing heart transplantation.

**Interventions**
Everolimus (1.5mg daily) and mycophenolate mofetil (3g daily) were compared with azathioprine (1.7mg/kg daily compared with everolimus and 1.92mg/kg daily compared with mycophenolate mofetil).

**Location/setting**
Germany/hospital.

**Methods**
Analytical approach:
This economic evaluation was based on data from two studies: one compared everolimus with azathioprine and the other compared mycophenolate mofetil with azathioprine. The time horizon was six months. The authors stated that the perspective of the payer was adopted.

Effectiveness data:
Both studies used to derived the clinical data were double-blind, randomised controlled trials (RCTs). The everolimus trial randomised 214 patients to azathioprine and 209 to everolimus, while the mycophenolate mofetil trial enrolled 289 patients to azathioprine and 289 to mycophenolate mofetil. The authors stated that the patients’ demographic and baseline characteristics were similar in both studies. Patients were followed up for six months after transplantation. The clinical endpoints included death, graft loss or re-transplantation, biopsy-proven acute rejection grade ≥3A, rejection with haemodynamic compromise, and loss to follow-up. The authors adjusted the clinical endpoints from the mycophenolate mofetil trial to generate the same composite as that in the everolimus trial. They considered two scenarios for this adjustment. In scenario one, the total population incidence of biopsy-proven acute rejection grade ≥3A was used for sub-populations and, in scenario two, specific data from the everolimus trial was used.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The health outcome was the absolute gain in efficacy, which was based on the composite of the clinical endpoints.
Cost data:
The economic analysis considered the direct medical costs, focusing on the cost of immunosuppression. The drug doses came from the RCTs and the drug prices were obtained from a public source. The price year was 2004 and all costs were in Euros (EUR).

Analysis of uncertainty:
A deterministic sensitivity analysis was undertaken to incorporate the potential variations in efficacy, and drug doses.

Results
Compared with azathioprine, the efficacy gain was 10.4% for everolimus, 9.8% for mycophenolate mofetil in scenario one, and 10.1% for mycophenolate mofetil in scenario two. The incremental cost over azathioprine was EUR 2,535 for everolimus and EUR 3,007 for mycophenolate mofetil.

The incremental cost-effectiveness ratio per efficacy failure avoided (gain) over azathioprine was EUR 24,457 for everolimus, EUR 30,628 for mycophenolate mofetil in scenario one, and 29,912 for mycophenolate mofetil in scenario two.

The sensitivity analysis confirmed that these results were robust.

Authors' conclusions
The authors concluded that everolimus was more cost-effective than mycophenolate mofetil compared with azathioprine for patients after heart transplant, but these results needed confirmation in a head-to-head trial.

CRD commentary
Interventions:
The selection of the three strategies was appropriate in that the proposed new approaches were compared with the widely used therapy for heart transplant patients.

Effectiveness/benefits:
The use of RCTs should have ensured the validity of the clinical analysis, but no systematic search of the literature was reported. The sources of the data were reported, but neither the methods used to identify the primary studies nor the inclusion criteria were reported, which makes it difficult to ascertain if the best available evidence was used.

Costs:
The categories of costs were consistent with the stated perspective. The unit costs were presented, which will help when replicating the analysis in other settings. The authors provided a detailed description of the method they used to derive the cost information, the sources used, and the assumptions made.

Analysis and results:
The authors conducted an appropriate incremental analysis, and the results for the non-dominated strategies were fully and clearly presented. Overall, the analytical approach was well reported. The results of the sensitivity analysis were fully reported, but a one-way sensitivity analysis accounts for limited uncertainty. A multi-way or even a probabilistic sensitivity analysis would have been more comprehensive.

Concluding remarks:
Overall, the methodology and results were presented clearly and valid sources of data were used. Due to the limits of the study design, the authors’ conclusions should be considered carefully.

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Bibliographic details

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