Estimated benefits of transplantation of kidneys from donors at increased risk for HIV or hepatitis C infection
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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 investigated the cost-effectiveness of two policies for kidney transplantation: the acceptance of kidneys from both standard and increased-risk donors; or standard donors only. The authors concluded that the inclusion of kidneys from increased-risk donors, in transplantation in the USA, could result in superior health outcomes at a lower cost over 20 years. There were some limitations to the transparent reporting of the methods and results. The authors’ conclusions should be viewed with caution.

Type of economic evaluation
Cost-utility analysis

Study objective
The aim was to examine the costs and benefits of transplantation of kidneys from donors who were at increased risk for human immunodeficiency virus (HIV) or hepatitis C virus (HCV) infection, in the USA.

Interventions
Two policies were compared. The transplant policy included kidneys from both standard donors and increased-risk donors, who were defined by the Centers for Disease Control (CDC), and the discard policy included only kidneys from standard donors. These were compared in a hypothetical cohort of 50-year-old haemodialysis patients without HIV or HCV. These patients had no live kidney donors, were on the 2002 national US kidney transplant waiting list, and were willing to accept kidneys from increased-risk donors.

Location/setting
USA/in-patient care.

Methods
Analytical approach:
A decision analytic Markov model was used to synthesise the data from published studies and national US end-stage renal disease database reports. The authors specified a 20-year period for the analysis and stated that a societal perspective was adopted.

Effectiveness data:
The clinical estimates included patient survival, number of kidney transplants, and incidence of HIV and HCV infections. The evidence for the clinical estimates was abstracted from over 40 published studies and CDC reports, which were produced since 1992, and these were clearly referenced. A few model parameters relating to patients and donors on the waiting list were based on the authors’ estimations.

Monetary benefit and utility valuations:
The utility valuations were obtained from seven published studies and an aggregated utility was used for two health states (HIV and HCV infection) based on the product of the published utility values.

Measure of benefit:
The measure of benefit was quality-adjusted life-years (QALYs), which were discounted at 3% per annum.
Cost data:
The types of resources were the costs of kidney transplants, and HIV and HCV testing. Data on the resources used and their values were derived from the literature except for HIV and HCV testing costs, which were expert opinions. Costs were given in US dollars ($), adjusted to 2002 prices, using the medical component of the consumer price index, and discounted at 3% per annum.

Analysis of uncertainty:
The parameter uncertainty was handled using one- and multi-way sensitivity analyses of the probability, incidence and cost variables. The results were reported in the text and the two-way analyses were presented in a graph.

Results
Over 20 years, the costs were $338,000 for the transplant policy compared with $363,000 for the discard policy. Per 1,000 patients, the transplant policy resulted in more HIV infections (2.3) compared with the discard policy (1.9) and fewer HCV infections (10.8 for transplant and 12.9 for discard). This was due to patients on the discard policy having longer periods on haemodialysis, which was associated with a high HCV incidence. The number of kidney transplants was 740 per 1,000 patients on the waiting list for the discard policy versus 990 for the transplant policy. The transplant policy resulted in 5.6 QALYs and the discard policy resulted in 5.1 QALYs.

The results for the one-way sensitivity analyses were not specifically reported, but the authors stated that these analyses did not substantially alter the conclusions of the base case. For the two-way sensitivity analysis, varying ranges of the population HCV incidence in each policy, the transplant policy remained preferable on all outcomes and yielded lower costs even in the worst-case scenario.

Authors' conclusions
The authors recommended that kidneys from increased-risk donors should be considered for transplantation because of the potential societal benefits in lower costs, better quality-adjusted survival, and fewer viral infections. They suggested that CDC transplant guidelines should be revised to include increased-risk donors.

CRD commentary
Interventions: The two transplant options were clearly explained in terms of the relative advantages and disadvantages, and contextual background. You should decide whether these options are suitable in your own setting.

Effectiveness/benefits: The effectiveness data were derived from a large number of studies that were well-referenced, but the methods used to select the studies and to derive the estimates were not reported. An assessment of the validity of these values is therefore not possible without recourse to the referenced studies. The transition probabilities were clearly reported and referenced.

Costs: The authors did not report the types, unit values, per cycle costs, nor sources of the medical costs and therefore, it is unclear whether they were appropriate to the stated societal perspective. The medical costs were taken from the literature, but the methods used to select these studies were not reported. An assessment of the validity of the cost data is therefore not possible.

Analysis and results: The results indicated that the transplant policy produced both cost savings and superior health benefits. Details of the Markov model were comprehensive and illustrated. The results of the sensitivity analyses were not clearly reported and it is difficult to assess the impact of uncertainty on the base-case findings. A probabilistic sensitivity analysis would have been appropriate. The authors estimated data for some parameters due to a lack of available epidemiological data.

Concluding remarks: As the methods and results were not fully reported, the quality of the modelled data and therefore the authors’ conclusions is difficult to assess.
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