Modelled cost-effectiveness of high cut-off haemodialysis compared to standard haemodialysis in the management of myeloma kidney

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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 study aimed to assess the cost-effectiveness of extended dialysis with high cut-off dialysers (HCO-HD) for the management of myeloma kidney compared with standard haemodialysis. The authors concluded that treatment of multiple myeloma with HCO-HD may substantially improve renal recovery, increase life expectancy and lead to reduced costs compared with standard dialysis. There were a few limitations to the study but the authors’ conclusions seem valid given the identified evidence base.

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

Study objective
The objective was to assess the cost-effectiveness of extended dialysis with high cut-off dialysers for management of myeloma kidney in patients with multiple myeloma.

Interventions
Extended dialysis with high cut-off dialysers (HCO-HD) until recovery of renal function or an average of 14.1 sessions before returning to standard haemodialysis was compared with haemodialysis alone.

Location/setting
UK/Secondary care

Methods
Analytical approach:
A decision tree model was used to synthesise data from a literature review of published studies over a lifetime horizon. The authors stated that the study perspective was that of the UK NHS.

Effectiveness data:
The evidence came from a non-systematic literature review conducted using PubMed and other databases of published studies. The methods used to derive estimates from these sources was described and appeared to be appropriate. The main clinical effectiveness estimates were the recovery of renal function and the life expectancy of patients with renal impairment. The sources of data for these parameters appeared to be observational studies.

Monetary benefit and utility valuations:
The sources of utility valuation were two studies from the published literature that each reported a single utility value: one was a phase III randomised study of newly diagnosed patients with multiple myeloma and the other a study of patients (not multiple myeloma patients) on dialysis. The latter was only used in a multiplicative adjustment of utility values in the sensitivity analysis. Discounting was applied at a rate of 3.5% per year.

Measure of benefit:
The primary measure of benefit was quality-adjusted life-years (QALYs).

Cost data:
The cost categories included the cost of dialysis, nursing time and albumin. Other costs such as chemotherapy and...
multiple myeloma relapses were assumed to be the same for each treatment arm and excluded. The sources for resource use were observational data from the published literature. Costs were based on national cost data adjusted to 2009 prices using the consumer price index for health. Discounting was applied at a rate of 3.5% per year.

**Analysis of uncertainty:**
The authors conducted univariate and probabilistic sensitivity analyses. Results of these analyses were presented in tables, on cost-effectiveness planes and using cost-effectiveness acceptability curves.

**Results**
Baseline results showed that treatment with HCO-HD resulted in an average 1.82 QALYs per patient compared with an average of 1.07 QALYs for patients on haemodialysis alone.

Treatment with HCO-HD cost £24,845 per patient compared with £31,345 per patient on haemodialysis alone.

Treatment with HCO-HD dominated (was more effective and less costly than) standard haemodialysis. The probability that HCO-HD was cost-effective was very high (97.7%) even at low levels of willingness to pay (£10,000) per QALY. The results were found to be robust.

**Authors’ conclusions**
The authors concluded that treatment of multiple myeloma with HCO-HD may substantially improve renal recovery, increase life expectancy and lead to reduced costs compared with standard dialysis.

**CRD commentary**

**Interventions:**
The level of reporting of the intervention was adequate. New technology was compared with standard practice and this appeared appropriate for the study setting.

**Effectiveness/benefits:**
The methods used to identify relevant studies were provided in terms of the databases searched. Search terms and inclusion criteria were not described explicitly, so it was unclear whether the best available data sources were used. However, the rarity of the condition and lack of evidence available made it likely that all relevant studies were identified and included. The level of reporting of the key clinical estimates was good; the authors provided an overview of the numbers of patients used in the studies and the key results. The derivation of benefit measure utilities was not as well described. It was not clear how the two studies were identified and whether these were the only data available.

**Costs:**
As with the effectiveness data, the methods used to identify relevant studies of resource utilisation did not include search terms and inclusion criteria and so it was unclear whether the best available data sources were used. The authors provided key information about the price year, discounting and cost adjustment techniques but did not reference the source of unit costs. The included costs appeared relevant to the perspective and were tabulated. The authors made some key assumptions about costs.

**Analysis and results:**
The model structure was well reported. An incremental analysis was appropriate to compare the relative cost-effectiveness of the alternative treatment pathways. The authors used appropriate methods to assess the impact of uncertainty on results and conclusions. It appeared that only key parameters (as defined by the authors) rather than all parameters were assigned distributions in the probabilistic analyses. The level of reporting of results was generally good. The authors discussed several key limitations to their study.

**Concluding remarks:**
There were a few limitations to the study but the authors’ conclusions seem valid given the identified evidence base.

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