An economic evaluation of hospital-based hemodialysis and home-based peritoneal dialysis for pediatric patients

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.

Health technology
Hospital-based hemodialysis and home-based peritoneal dialysis.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study was restricted to chronic, nonterminal, end-stage renal patients over 2 years of age and weighing more than 20kg. Also, no patient comorbidities exist in the study.

Setting
The practice setting was that of a "regional tertiary centre for pediatric patients", in Toronto, Canada.

Dates to which data relate
Effectiveness data were collected over the period 1982-1993. Cost data were collected over the period 1993-1994. The price year was 1994.

Source of effectiveness data
The estimates for final outcomes were based on opinion.

Modelling
A probability model incorporating incidence rate of complications for each treatment option was used for calculating total costs.

Methods used to derive estimates of effectiveness
The estimates of effectiveness were assumptions based on information from the literature review employed in the cost analysis, and the study hospital's own experience.

Estimates of effectiveness and key assumptions
The outcomes assessed were as follows:
For hemodialysis patients: the probability of developing an arteriovenous clot spread over the probability range 30%-60% risk,

For peritoneal dialysis patients: the probability of peritonitis requiring hospitalisation and inguinal hernia repair, respectively 20%-50% and 10%-20% of risk range.

It was further assumed that no patient comorbidities existed, and that the complications considered in the analysis reflected the current experience.

**Measure of benefits used in the economic analysis**
The measure of benefits used in the analysis was the rate of complications.

**Direct costs**
Some quantities were reported separately from costs. The following costs were assessed: therapeutic interventions (e.g. operating room); diagnostic interventions; equipment; professional services (e.g. surgeon/anesthetists fees, etc) and overheads. The perspective adopted was that of the hospital. A model was used in estimating final costs based on actual data from the study hospital. 1994 prices were stated. The costs associated with peritoneal dialysis catheter exit site infection or resource use of patients with a central venous line placed were omitted.

**Currency**
Canadian dollars (Can$), with Can$1 = US$0.75 dollars (1994).

**Sensitivity analysis**
One-way sensitivity analysis was carried out to analyse the effects of complications on treatment costs (based on the ranges found in the literature).

**Estimated benefits used in the economic analysis**
The probability of developing an arteriovenous clot was spread over the probability range 30%-60% risk, whilst the probability of peritonitis requiring hospitalisation and inguinal hernia repair was spread over the probability range 20%-50% and 10%-20% respectively.

**Cost results**
Total annual costs were: typical (uncomplicated) continuous ambulatory peritoneal dialysis, Can$76,023. Expected total annual cost of hemodialysis complicated by an arteriovenous fistula clot and central venous line blockages, or peritoneal dialysis complicated by hernia repair and peritonitis was Can$78,568 and Can$50,438 for hemodialysis and peritoneal dialysis respectively. The sensitivity analysis showed that the expected total costs were always lower with peritoneal dialysis than with hemodialysis.

**Synthesis of costs and benefits**
No synthesis of costs/benefits was performed.

**Authors' conclusions**
Peritoneal dialysis was less costly than hemodialysis for pediatric patients. (Note: the authors themselves recommended that the results of the analysis should not be used alone in making treatment decisions since no proper analysis of effectiveness was carried out).
Whilst this partial analysis adequately addressed the question of costs (exceptions being the use of a basic case-series analysis, and the wide difference in dates between cost and effectiveness data) the question of outcomes/effectiveness was barely touched upon, thus limiting the study's external validity. Nevertheless, it should be recognised that these flaws arose from the limited scope of the study which, as the authors made clear, was aimed at producing a cost analysis rather than a full economic evaluation. The authors also noted that a broader perspective than that of the health care system (e.g. societal) might have improved the study as cost-shifting factors could be important in explaining the cost findings.

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