Effect of recombinant erythropoietin on hospital admissions, readmissions, length of stay, and costs of dialysis 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
Recombinant human erythropoietin (rHuEPO) treatment for patients with dialysis-dependant end stage renal disease (ESRD)

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients had to be alive and enrolled in ESRD programme for at least 18 months, to be entitled to Medicare services, to be receiving dialysis that was paid for by Medicare and to be without a functioning kidney transplant. Mean age was 58.0 years.

Setting
Hospital. The study was carried out in the USA.

Dates to which data relate
Effectiveness data and resource use data related to the period between November 1988 and September 1990. The period to which prices related was not stated.

Source of effectiveness data
Effectiveness data was derived from a single study.

Link between effectiveness and cost data
Costing was undertaken on the same patient sample as that used in the effectiveness study. Costing was carried out retrospectively.

Study sample
A total of 23,806 patients in the rHuEPO group and 22,720 patients in the control group were included in the study. No power calculations were reported as determining the sample size. Both groups were identified from a national database of ESRD patients. No information was given on the number of patients excluded on ineligibility grounds.
Study design
Retrospective, longitudinal, matched cohort study (concurrent control). The follow up period was 9 months after commencement of rHuEPO treatment. No loss to follow up was reported.

Analysis of effectiveness
The analysis was based on treatment completers only. The health outcomes were proxied by the overall number of admissions and days in hospital. The control group (as well as the intervention group) needed to have received dialysis for 9 months before the intervention period and were matched with the treatment group on 6 main demographic and ethnic characteristics.

Effectiveness results
rHuEPO was associated with an increase in the probability of hospital admission but a decrease in readmissions, resulting in fewer overall admissions and hospital days. The adjusted relative odds of admission (adjusted for the frequency of admission in the 9 months prior to the intervention period) were higher for the treatment group at 1.08 (95% CI: 1.03 - 1.14). There was a statistically significant (p=0.03) overall mean reduction of 38 admissions per 1,000 patients and 1,309 fewer in-patient days per 1,000 patients in favour of the treated group relative to the control (p<0.001). The probability of hospital admission for the intervention group was particularly associated with likely adverse effects of the drug.

Measure of benefits used in the economic analysis
Benefits (health outcomes) were proxied by the number of admissions and days in hospital avoided.

Direct costs
Costs were not discounted. Some quantities were analysed separately from costs. The number of admissions, readmissions and in-patient days were measured and valued. Hospital costs were derived by applying the hospital-specific cost-to-charge ratio to Medicare charges. Only direct health service costs to the hospital sector were included. The estimation of quantities was based on patient records. The resource use data related to the period November 1988 to September 1990. Price dates were not given. Costs were not reflated and there was no discussion of average and marginal costs.

Currency
US dollars ($).

Sensitivity analysis
A sensitivity analysis was not carried out.

Estimated benefits used in the economic analysis
rHuEPO led to a mean reduction of 38 admissions per 1000 patients and 1309 fewer days in hospital per 1000 patients. Patients were followed up for 9 months.

Cost results
There was a statistically significant difference in hospital inpatient costs between the two groups of $-371 (p= 0.03) in favour of the intervention.

Synthesis of costs and benefits
The cost and benefits associated with the intervention were not combined since the intervention was the dominant
strategy.

**Authors' conclusions**
Although the use of rHuEPO leads to initial additional costs of care this may be offset by fewer overall admissions and fewer days spent in hospital, possibly offsetting the drug cost and resulting in long term savings.

**CRD Commentary**
The authors acknowledged many of the limitations of the study. Patients were not randomised to the arms of the study hence there is a danger that an unmatched confounding variable may account for the observed differences between the groups. The control group was not given a placebo drug. No information was given on the comprehensiveness of the coverage of the database from which the patients were selected, nor whether all patients on the database meeting the eligibility criteria were included. Patients who died (the most severely ill) were excluded. The 9 month observation period represents a relatively short follow-up. There was no explanation of the costing methodology used in deriving hospital costs and charges. The cost of the drug itself was not included, although the authors suggested that it was a significant cost component. Only hospital costs were included and not the cost to primary health care services. Patients were not treated by the same provider so differences could be due to quality of care or variations in clinical practice.

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