**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**
The authors assessed recombinant human erythropoietin (rHuEPO) (Eprex; Janssen-Ortho, Toronto) given subcutaneously (s.c.) and darbepoetin (Aranesp; Amgen Canada, Mississauga) given intravenously (i.v.).

**Type of intervention**
Treatment.

**Economic study type**
Cost-effectiveness analysis.

**Study population**
The study population comprised patients with anaemia further to chronic renal failure (CRF) in dialysis and pre-dialysis patients. To be included in the study, the patients had to be receiving rHuEPO therapy 6 months prior to the switch and had to remain on darbepoetin for at least 12 months after the switch. Patients were excluded if they were already receiving darbepoetin prior to the switch.

**Setting**
The setting was secondary care. The economic study was carried out in Vancouver, Canada.

**Dates to which data relate**
The effectiveness data referred to patients treated between September 2002 and March 2004. Resource use was measured over the same time. A price year was not reported.

**Source of effectiveness data**
The effectiveness data were derived from a single study.

**Link between effectiveness and cost data**
The cost data were collected retrospectively for pre-switch information and prospectively for post-switch information.

**Study sample**
The sample size was determined by the number of patients treated in the study setting over the dates of the study. Therefore, power calculations were not used to estimate the optimal sample size required to rule out the influence of chance. The authors reported that 161 patients were in the high dependency (HD) unit at the time of the switch and that 66 patients were excluded in accordance with the study inclusion and exclusion criteria.
Study design
The authors designed a within-group comparison study. Patients were observed 3-monthly for 6 months prior to the switch (phase 1). Immediately following the switch there was a 6-month dosage titration period, and then patients were observed again from 6 months to 12 months post-switch (phase 2). The analysis was based at a single centre, Vancouver General Hospital, Canada. Sixteen patients were lost to follow-up, either through death or transfer.

Analysis of effectiveness
The analysis of effectiveness was based on each patient being treated with both technologies of interest. The primary health outcomes were:

- serum haemoglobin (Hb),
- the weekly doses of rHuEPO and darbepoetin, serum ferritin,
- percentage transferrin saturation (TSAT), and
- weekly i.v. iron dose.

Data from the two phases were analysed using repeated measures analysis of variance, Tukey's HSD test, and chi-squared analysis. The level of significance was set at p<0.05 for hypothesis testing.

Effectiveness results
The authors reported that there was no difference in serum Hb levels between the two phases.

The median dosage of rHuEPO increased from 8,000 U/week at 6 and 3 months pre switch to 9,000 U/week at the time of the switch.

The median dose of darbepoetin remained at 30 microg/week throughout the dose titration period and phase 2.

Serum ferritin was significantly lower during phase 1, and there was no difference in either TSAT, transfusion requirements, or the urea reduction ratio between phases.

Clinical conclusions
The authors concluded that i.v. darbepoetin was able to maintain serum Hb levels to a similar extent to s.c. rHuEPO.

Measure of benefits used in the economic analysis
The authors did not estimate a summary measure of health benefit. The study was, in effect, a cost-consequences analysis.

Direct costs
The authors estimated the direct costs of rHuEPO and darbepoetin by observing the required doses and combining these with the unit costs of each drug. A perspective for the analysis was not reported. Nevertheless, as the treatment of the individuals was the same over time apart from the drug used, this direct comparison of drug costs could be appropriate to many perspectives if was incorporated into a wider economic analysis. Discounting was not necessary as the time period for the costing of each intervention was only 6 months. No price year was reported. The authors did not indicate whether the prices changed between the 2 years that the resources were costed. The unit costs were taken from British Columbia contract prices.

Statistical analysis of costs
The authors estimated cost ranges based on differences in dosage.
Indirect Costs
The indirect costs were not estimated.

Currency
Canadian dollars (CAD).

Sensitivity analysis
Sensitivity analyses were not reported.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The median weekly cost of rHuEPO per patient was CAD 128.25 (range: 114.25 to 427.50)

The median weekly cost of darbepoetin per patient was CAD 80.40 (range: 6.70 to 402.00)

The median cost-saving for all patients associated with darbepoetin over the 12-month period was CAD 212,502.00.

Synthesis of costs and benefits
Not relevant.

Authors’ conclusions
Darbepoetin was found to be as effective as recombinant human erythropoietin (rHuEPO) in maintaining serum haemoglobin (Hb) within the target levels, but at a substantially reduced cost.

CRD COMMENTARY - Selection of comparators
The authors compared rHuEPO and darbepoetin. Prior to a switch in guidelines, rHuEPO was the treatment of choice in the study setting. However, the authors followed guidelines and made a switch to darbepoetin.

Validity of estimate of measure of effectiveness
The authors designed a within-group comparison study. This was appropriate for the natural sequence of events taking place in the study setting, and was sufficient to assess the management of anaemia during the switch. This kind of study design has the risk that the patients' conditions may change over time. The study sample was representative of the study population as it included patients receiving the technologies of interest over the course of the study. The authors monitored patients at 3-month intervals over the pre- and post-switch periods, and incorporated a dose titration period to reduce impacts associated with variations in dosages due to the switch itself. Appropriate statistical analyses were used to assess differences in outcome in the before and after periods.

Validity of estimate of measure of benefit
The authors did not estimate a summary measure of health benefit. The study was, in effect, a cost-consequences analysis.

Validity of estimate of costs

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A perspective for the cost analysis was not reported, as the authors carried out a very basic evaluation comparing the direct costs associated with usage of the two drugs. A more thorough analysis might have accounted for differences in the times to administer the drugs and potentially costly side effects. Although basic, the analysis was clearly reported, with unit costs and dosage quantities enabling the reader to gain a good understanding of the analysis carried out. Since a price year was not reported, it will not be possible to reflate the cost estimates to different years.

Other issues
The authors were able to draw effectiveness comparisons between their own work and that of other authors involved in randomised controlled studies, as well as open-label observation studies. Their findings seem to have been consistent, with no difference found in the mean change in Hb. The issue of generalisability was not addressed and, though improved by the use of British Columbia contract prices rather than institution specific prices, it is limited by the factor mentioned above. The results presented relate well to the objectives set out by the authors, and do not appear to have been presented selectively. However, a more detailed cost analysis may prove more informative in future. Several limitations, which focused on the non-randomised open-label design of the study, were highlighted.

Implications of the study
The authors developed a recommended dose conversion chart as part of the secondary analysis. They acknowledged that these recommendations would require further testing but, nevertheless, they may inform practice in future.

Source of funding
None stated.

Bibliographic details

PubMedID
16047646

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Aged; Analysis of Variance; Chi-Square Distribution; Darbepoetin alfa; Dose-Response Relationship, Drug; Drug Administration Schedule; Drug Costs; Erythropoietin /administration & dosage /analogs & derivatives /economics /therapeutic use; Female; Hemoglobins /analysis; Humans; Injections, Intravenous; Kidney Failure, Chronic /therapy; Male; Recombinant Proteins; Renal Dialysis; Retrospective Studies; Treatment Outcome

AccessionNumber
22005001188

Date bibliographic record published
31/08/2006
Date abstract record published
31/08/2006