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 examined the cost-effectiveness of recombinant human erythropoietin compared with blood transfusion alone for the treatment of patients with chemotherapy-induced anaemia. The authors concluded that erythropoietin was not a cost-effective alternative to blood transfusion alone from the perspective of the Thai health care provider. The methods were valid and the authors’ conclusions appear to be robust, despite the limited reporting of the sources of clinical data.

Type of economic evaluation
Cost-utility analysis

Study objective
This study examined the cost-effectiveness of recombinant human erythropoietin compared with blood transfusion alone for the treatment of patients with chemotherapy-induced anaemia.

Interventions
A strategy of recombinant human erythropoietin was compared with blood transfusion alone. A full dose (150 international units per kg, three times a week) of erythropoietin was given to patients with a haemoglobin level of less than 10g per dL, while a half dose was given to those with a haemoglobin level of 10 to 11g per dL.

Location/setting
Thailand/hospital.

Methods
Analytical approach:
The analysis was based on a published Markov model that was modified to reflect the treatment guidelines for anaemia caused by chemotherapy. The time horizon was seven months. The authors stated that the perspective of the Thai health care system was adopted.

Effectiveness data:
The clinical data came from a published cost-effectiveness analysis identified in a systematic review, but the methods and conduct of this review were not reported. The rate of response to erythropoietin was the key clinical input.

Monetary benefit and utility valuations:
The utility values were from a publication of cost-effectiveness data from two manufacturers. This was identified in a systematic review and used the time trade-off technique to elicit patient preferences on different haemoglobin levels.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the summary benefit measure.

Cost data:
The economic analysis included the costs of blood transfusion and erythropoietin, which consisted of product acquisition, administration, and laboratory monitoring. The cost of laboratory monitoring was assumed to be the same in both groups. Personnel costs were also considered. The cost data were derived from reference prices of the Thai...
Ministry of Public Health and the Civil Servant Medical Benefit Scheme. All costs were in Thai baht (THB) and the price year was 2007.

Analysis of uncertainty:
A probabilistic analysis based on a second-order Monte Carlo simulation was undertaken using pre-specified probability distributions for all the model inputs. Average estimates for the model outputs were calculated.

Results
In a population of patients with haemoglobin of less than 8g per dL, the expected costs were THB 127,937 and QALYs were 0.31 with erythropoietin, and costs were THB 11,434 and QALYs were 0.28 with blood transfusion, resulting in an incremental cost per QALY gained with erythropoietin of THB 3,789,762.

In a population of patients with haemoglobin between 8 and 9g per dL, the expected costs were THB 112,621 and QALYs were 0.34 with erythropoietin, and the costs were THB 11,434 and QALYs were 0.30 with blood transfusion, resulting in an incremental cost per QALY gained with erythropoietin of THB 2,746,506.

In a population of patients with haemoglobin between 9 and 10g per dL, the expected costs were THB 97,141 and QALYs were 0.34 with erythropoietin, and the costs were THB 11,434 and QALYs were 0.35 with blood transfusion, resulting in the dominance of blood transfusion as it was the cheapest and most effective strategy.

The probabilistic sensitivity analysis showed that only at a willingness-to-pay threshold of THB 3 million per QALY was erythropoietin cost-effective for patients with a haemoglobin level of less than 8g per dL and between 8 and 9g per dL. The provision of erythropoietin was not cost-effective (except at a threshold above THB 12 million) for patients with haemoglobin levels between 9 and 10g per dL. The recommended threshold in Thailand was around THB 300,000 per QALY, based on the Thai gross domestic product.

Authors’ conclusions
The authors concluded that erythropoietin was not a cost-effective alternative to blood transfusion alone from the perspective of the Thai health care provider.

CRD commentary
Interventions:
The selection of the comparators appears to have been appropriate as they were valid treatments for patients with chemotherapy-induced anaemia. The dosages of erythropoietin were reported.

Effectiveness/benefits:
The authors did not provide a clear description of the literature review that was used to identify the clinical inputs. The study used for most of the clinical inputs was published elsewhere, but a report of the key aspects of the review (sources searched, inclusion/exclusion criteria, homogeneity of studies, etc) would have helped to assess the validity of these estimates. Some of the key details of the derivation of the utility values were presented. QALYs were an appropriate benefit measure as they focus on quality of life, which is a relevant dimension of health for this patient population.

Costs:
The economic analysis was well carried out. The cost categories and data sources were consistent with the economic viewpoint. The unit costs and the price year were reported. Resource quantities appear to have been based on recommended dosages and conventional patterns of care. The cost estimates were treated deterministically in the base case, but appropriate probability distributions were assigned in the Monte Carlo simulation. The currency conversion rates were reported.

Analysis and results:
The costs and benefits were appropriately presented and synthesised in an incremental analysis. The issue of uncertainty was satisfactorily investigated using a stochastic approach and the results were clearly presented. The authors stated that their results were similar to those of other published economic evaluations of recombinant human erythropoietin in patients with chemotherapy-induced anaemia.
Concluding remarks:
The methods were valid and the authors’ conclusions appear to be robust, despite the limited reporting of the sources of clinical data.

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