Revaclear impact on erythropoietin stimulating agent doses: a budget impact analysis for dialysis providers

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Abstract

OBJECTIVES: In a comparative effectiveness study using electronic medical records from a large dialysis organization in the USA (Sibel S et al, manuscript in preparation), the use of Revaclear high flux dialyzers was associated with a lower usage of erythropoietin stimulating agents (ESA) when compared with control high flux dialyzers (Optiflux 160NR and 180NR). The difference in ESA doses between Revaclear and the controls varied with time, but was ≥ 251 IU/session versus Optiflux 160NR as of Month 4 and ≥173 IU/session versus Optiflux 180NR as of Month 3. The present analysis was conducted to estimate the budget impact this reduction in ESA doses could have for dialysis providers.

METHODS: A budget impact model was built in Excel. The perspective was that of a dialysis provider and the time horizon was 1 year. Parameters included: the number of patients per month (incident and prevalent), the Revaclear adoption scenario, the reduction in ESA dose per dialysis session on a monthly basis over the first 12 months on Revaclear, and the cost of 1000 international units (IU) of ESA. The dose of ESA saved per session at each month was taken from the comparative effectiveness study while the cost of ESA was the wholesale acquisition cost (WAC) taken from the US Red Book Online. The number of patients per month was assumed to be stable at 100, with 10 new patients per month replacing 10 patients leaving the clinic. Half of the prevalent patients were assumed to be on Optiflux 160NR and the other half on Optiflux 180NR. Two adoption scenarios were tested; one considered that only new patients were immediately started on Revaclear (scenario 1), the other considered that all patients were immediately using Revaclear (scenario 2). In addition to scenario analyses, the robustness of the conclusions was tested via sensitivity analyses on the price of ESA (±20% of the WAC).

RESULTS: The model estimated that savings of 1.6 Million IU of ESA would result from the use of Revaclear in new patients this hypothetical 100-patient clinic with 10 new patients per month. In comparison, 4.2 Million IU of ESA would be saved if Revaclear was used in all patients. Using a WAC of $14.47 per 1000 IU, this would translate into overall annual savings of $23 thousand and $61 thousand, respectively, depending on the adoption scenario. Using a 20% lower acquisition cost would reduce the savings to $19 and $48 thousand, respectively, while a 20% higher acquisition cost would increase the savings to $29 and $72 thousand, respectively.

CONCLUSIONS: This analysis shows that the reduction in ESA doses associated with Revaclear use in a comparative effectiveness study has the potential to generate non-negligible savings to dialysis providers. More evidence is needed to confirm the impact of Revaclear on ESA usage and more extensive modelling is needed to assess the financial impact to dialysis providers outside the United States. .

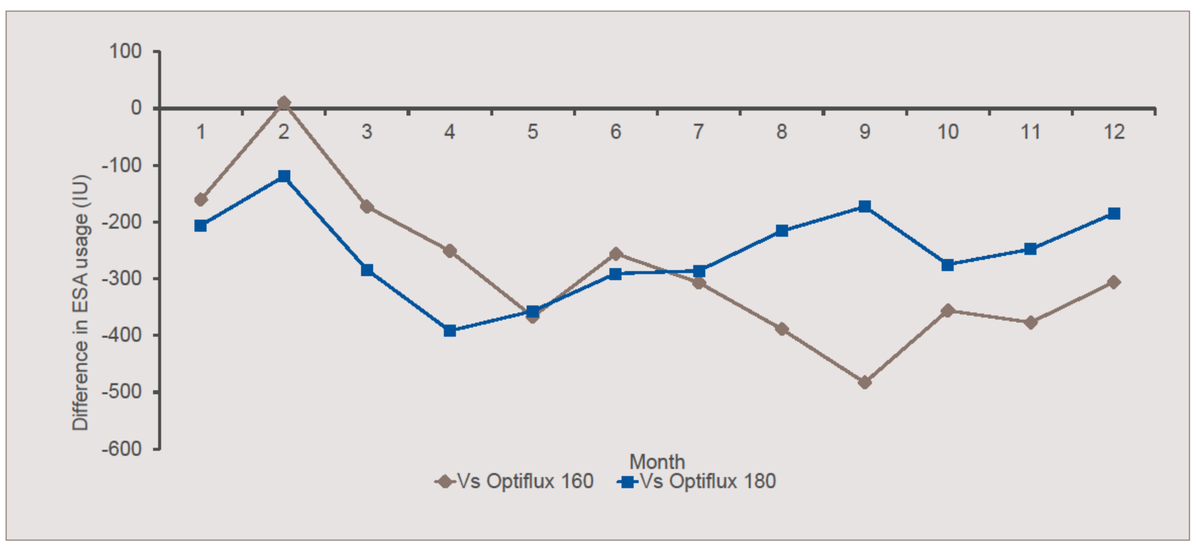
Background

In a comparative effectiveness study using electronic medical records from a large dialysis organization in the USA[1], the use of Revaclear high flux dialyzers was associated with a lower usage of erythropoietin stimulating agents (ESA) when compared with control high flux dialyzers (Optiflux 160NR and 180NR). The difference in ESA doses between Revaclear and the controls varied with time, but was ≥ 251 IU/session versus Optiflux 160NR as of Month 4 and ≥173 IU/session versus Optiflux 180NR as of Month 3 (Figure 1).

Objectives

Estimate the impact of lower ESA doses associated with the use of a high flux dialyser such as Revaclear on the dialysis providers' budget .

Figure 1: Average monthly difference in ESA usage per session



Methods

A budget impact model was built in Excel.

Model structure:

- Perspective: dialysis provider
- Time horizon:1 year
- Parameters included:
  - number of patients per month (incident and prevalent)
  - Revaclear adoption scenario
  - Reduction in ESA dose per dialysis session on a monthly basis over the first 12 months on Revaclear (see Figure 1)
  - Cost of 1000 international units (IU) of ESA.
- Outcomes:
  - Annual ESA IU saved
  - Annual savings in 2014 USD

Sensitivity analysis:

- 2 adoption scenarios:
  - All new patients (i.e., 10 new patients per month) [Scenario 1]
  - All patients (i.e., 100 patients) [Scenario 2]
- ±20% variation in ESA price

Data sources:

All data sources and assumptions are presented in Table 1.

The reduction in ESA was obtained by multiplying the average difference in ESA per session for each month by the number of patients, assuming the relative usage of Optiflux 160 and 180 would have been 50:50. An example of the computations for the first month of the "all new patients" (Scenario 1) adoption scenario is given in Table 2.

Table 1: Model inputs and assumptions

Input	Value	Source
Relative usage of 160 and 180 dialyzers	50:50	Revaclear vs Optiflux comparative effectiveness study[1]
Price of 1000 IU ESA	$14.47 Varied by ±20% in sensitivity analysis	2014 - Wholesale acquisition cost (WAC)[2]
Number of prevalent patients in the clinic	100 (remaining constant over time)	assumption
Number of incident patients per month	10	assumption
Number of patients per month leaving the clinic	10	assumption
Adoption scenario 1	All new patients (i.e., 10 patients per month)	assumption
Adoption scenario 2	All patients (i.e., 100 patients)	assumption

Table 2: Example of ESA reduction computation

		I (vs Optiflux 160)	II (vs Optiflux 180)
A	Difference in ESA per session at month 1 (IU)	161	206
B	Number of sessions per month	13	13
C	Number of new patients in month 1	10	10
D	Percent of new patients who would have received the control dialyzer	50%	50%
E	Reduction in ESA (IU) (A x B x C x D)	10,465	13,390
	Total reduction in ESA in month 1 (IU) (EI + EII)	23,855	

Results

The model estimated that savings of 1.6 Million IU of ESA would result from the use of Revaclear in new patients in this hypothetical 100-patient clinic with 10 new patients per month. In comparison, 4.2 Million IU of ESA would be saved if Revaclear was used in all patients (Figure 2).

Using a WAC of $14.47 per 1000 IU, this would translate into overall annual savings of $23 thousand and $61 thousand, respectively, depending on the adoption scenario. Using a 20% lower acquisition cost would reduce the savings to $19 and $48 thousand, respectively, while a 20% higher acquisition cost would increase the savings to $29 and $72 thousand, respectively (Figure 3).

Figure 2: Reduction in ESA usage (Million IU per year)

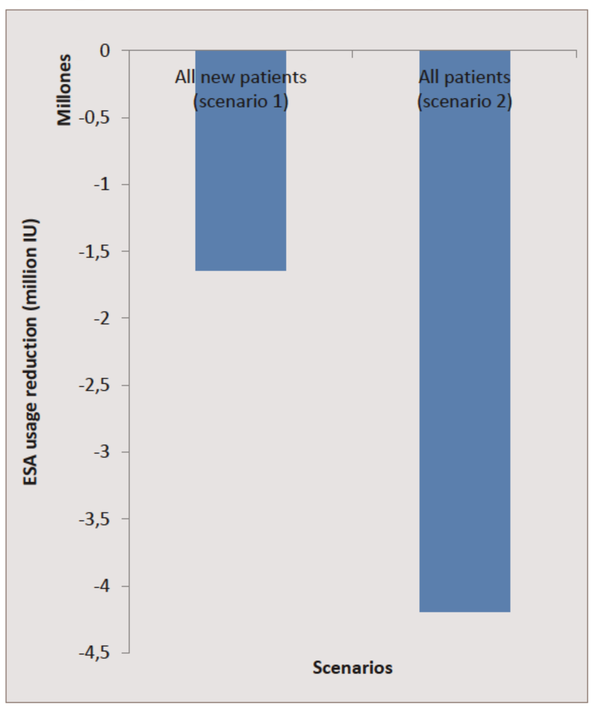
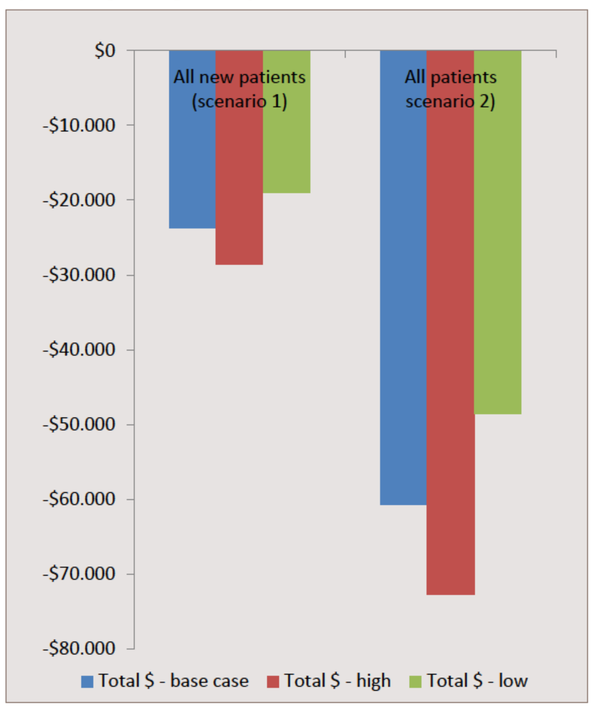


Figure 3: Savings in ESA usage ($US per year)



Conclusions

This analysis shows that the reduction in ESA doses associated with Revaclear use in a comparative effectiveness study has the potential to generate non-negligible savings to dialysis providers. More evidence is needed to confirm the impact of Revaclear on ESA usage and more extensive modelling is needed to assess the financial impact to dialysis providers outside the United States.

References

1. Sibel S et al, manuscript in preparation
2. US Redbook online available at: http://www.redbook.com/redbook/index.html. Last accessed on: January 5, 2015.

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