

Potential contribution of less frequently dosed erythropoiesis stimulating agents to the operational efficiency of anaemia management: A study in 4 Swiss haemodialysis centres

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BACKGROUND

- Erythropoiesis stimulating agents (ESAs) are effective agents for increasing haemoglobin levels in patients with end stage renal disease (ESRD) on dialysis.
- Darbepoetin Alfa, a longer-acting ESA, requires less frequent dosing (weekly [QW] or every other week [Q2W]) than other erythropoiesis stimulating agents (e.g. epoetin alfa) in the dialysis population.¹⁻³
- Anaemia management in haemodialysis is a complex process and requires a significant amount of operational resources.
- To date, the total operational aspects and costs of ESA delivery have not been described comprehensively, and the dissimilarities in this process between different hospitals have not yet been investigated.
- Previous studies also did not focus on the impact of less frequent dosing of ESA on this total operational cost.

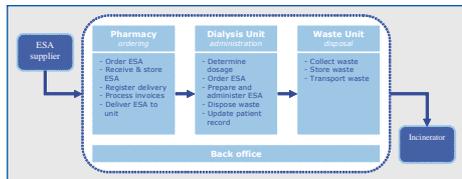
OBJECTIVE

- To characterize the entire process of ESA delivery, from drug order to incineration of the syringe, and the associated costs.
- To evaluate the impact of less frequent dosing on the costs associated with ESA delivery.
- To investigate differences between the processes of ESA delivery and their related costs in 4 Swiss hospitals.

METHODS

- Mercurius study was conducted in 37 dialysis centres in 9 European countries. Here, we report results of the 4 Swiss hospitals that participated in the study, which treated on average 63.5 patients (range 51-83 patients).
- A conceptual model was developed to classify the generic processes and sub processes related to anaemia management in the 4 involved departments: pharmacy, dialysis unit, waste unit and back-office (Figure 1).⁴

Figure 1. Generic Process Flow Diagram



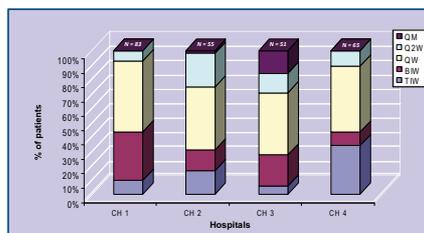
- To determine the hospital specific processes related to anaemia management, structured interviews with staff were done.
- Each process and its consecutive activities were evaluated to determine if less frequent dosing affected the time or materials needed to perform this activity.
- The amount of time and materials associated with each activity were determined by observing and measuring each activity on different occasions in the 4 centres.
- The labour costs (full cost of a certain function) and material costs were derived from the accounting records of each individual hospital.
- A calculation model was developed to estimate the change in resources consumed when using once-every-other week dosing compared to the current practice of ESA administration.
- The conversion ratio used is 200 IU:1 mcg epoetin:darbepoetin alfa, per approved label in Switzerland.⁵

RESULTS

Dosing Frequency of ESAs

- In the current situation, 46% patients were receiving an ESA once a week and 37% several times a week.
- The dosing frequency distributions for the 4 hospitals are shown in Figure 2.

Figure 2. Dosing Frequency for 4 Swiss Centres – By ESA



Costs Associated with ESA Delivery

- The majority of labour costs associated with ESA delivery was concentrated in the dialysis units (Figure 3a). The annual mean labour cost in the HD units in the current situation is 8'759 CHF (± 6'186).
- There is substantial variation in labour costs associated with ESA delivery in the 4 Swiss centres, which can primarily be allocated to the number of patients and the current dosing regimes (Figure 3b).
- Remaining differences in current cost structures of the 4 hospitals can be explained by hospital specific characteristics (e.g. method of ordering and economies of scale).

Figure 3a: Annual Variable Labour Costs Associated with ESA Administrations, Using Current Dosing Regimes

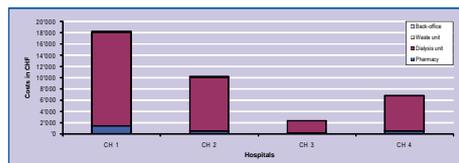
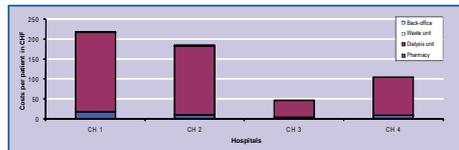


Figure 3b: Annual Variable Per Patient Labour Costs Associated with ESA Administrations, Using Current Dosing Regimes



- The average annual material costs associated with ESA delivery for the 4 hospitals is 8 CHF per patient. These material costs were mainly concentrated in the dialysis unit: disinfection tissues, disinfection liquid, etc.

Estimated cost reductions with Q2W Dosing

- Q2W dosing leads to a decrease of the annual number of administrations from 19'012 to 6'604 for the 4 centres, or a reduction of 65%.
- Labour costs are predicted to decline with less frequent ESA administration. Switching from current dosing regimes to a Q2W regime induces a mean annual labour saving of 5'792 CHF (± 3'924) or 63% (Figure 5).
- The largest reductions in labour cost were found in the dialysis unit, due to the decrease of the number of administrations and the length of time required to prepare and administer ESA to a patient.
- Q2W dosing makes a cost reduction in materials of 65% possible. This reduction is mainly driven by the decrease in number of administrations and number of syringes.
- Maximal estimated cost reductions were found when ESA administrations were reduced from TIW to Q2W dosing. A mean annual labour saving of 14'929 CHF (± 10'739) or 223 CHF per patient (± 136) was estimated (Figure 5).

Figure 4: Annual Variable Labour Cost Reductions Using Q2W Dosing, As Part of Total Variable Labour Costs Using Current Dosing Regimes

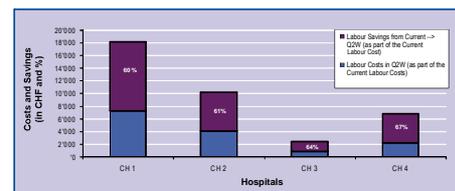
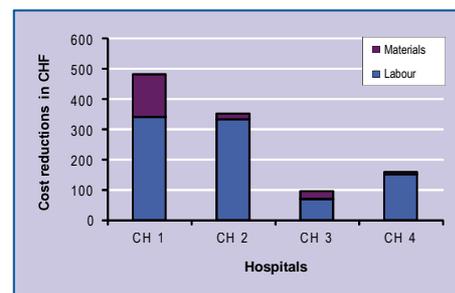


Figure 5: Annual Variable Cost Reductions Per Patient After Switching from TIW to Q2W Dosing



DISCUSSION

- There are quantifiable labour and material cost reductions associated with less frequent dosing of ESAs in the Swiss anaemic dialysis population.
- Other not quantified benefits of less frequent dosing can be reported, e.g. decrease in risk of needle accidents.
- Reduction of the work load for health care professionals in the dialysis unit, can contribute to the quality of care for the patients.
- These data demonstrate that there is substantial variation in the costs associated with ESA delivery for the 4 Swiss hospitals. This variation is driven by number of patients, current dosing regimes, economies of scale and hospital specific characteristics (e.g. working methods).

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