

Budget-Impact-Analysis of iron treatment using intravenous ferric carboxymaltose in patients with chronic heart failure and iron deficiency in Austria

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Objectives

Iron deficiency (ID), a non-cardiovascular comorbidity, is highly prevalent in chronic heart failure (CHF) patients and imposes a significant disease burden for CHF patients with enormous impact on their outcome and health care costs. CHF with ID is a major reason for hospitalization and represents important costs for the national health care budget in Austria. Yet, only a small percentage of CHF patients with ID are diagnosed. Based on IMS sales data (MAT4 2012 MAT4 2013, MAT 4 2014) around 30% of patients with iron deficiency or iron deficiency anemia obtain iron therapy. 80% receive oral iron therapy and only 20% iv iron therapy.

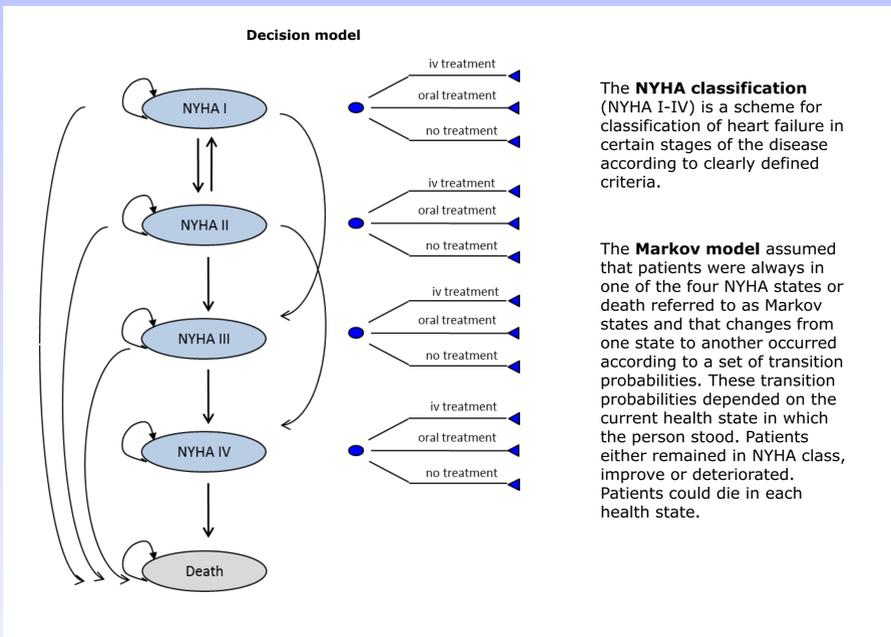
Thus, the objective of this analysis is the evaluation of the cost saving potential through an increased use of intravenous iron therapy with ferric carboxymaltose (FCM) based on clinical trial evidence.

Methods

A budget impact analysis (BIA) with a four-year's time horizon was developed from the payer's perspective. The main objective of the model was to assess the change of the number of diagnosed patients (rise from 30% to 50% over 3 subsequent years), the adjustment of disease progression due to higher percentage of treated patients with iv iron (the proportion rise from 18% to 30% over 3 subsequent years) and subsequently the impact on the health care costs.

Disease progression was modelled by using a sequential Markov model with monthly transitions of NYHA health states of the cohort. Probabilities were derived from clinical and epidemiological studies. The cohort definition was adapted from the FAIR-HF study. The model takes into account direct costs (NYHA, hospital, outpatient and iron therapy) from 2014 and data from a systematic literature review (RCT, cohort studies and clinical guidelines). Two pivotal studies (FAIR-HF and CONFIRM-HF) showed that the iron deficiency with FCM, an iv iron, results in clinical meaningful benefits.

Fig. 1: Model Design



Source: own developed

Resource Use and Costs

The total costs per patient are a function of both the quantity of given resource used and its unit cost. The resource use was determined by the systematic literature review (e.g. RCT, cohort studies, disease specific guidelines). Direct costs comprise all direct medical costs like consultation, lab test, inpatient costs, medication and treatment costs from catalogue and official price lists for the Austrian health insurances funds and the Austrian official drug price list (Warenverzeichnis). Inpatient treatment costs are derived from the Austrian DRG catalogue (LKF). An overview of the cost data contain in the analysis as shown in Tab. 1. Costs were discounted at 5% p.a.

Tab. 1: Costs Components

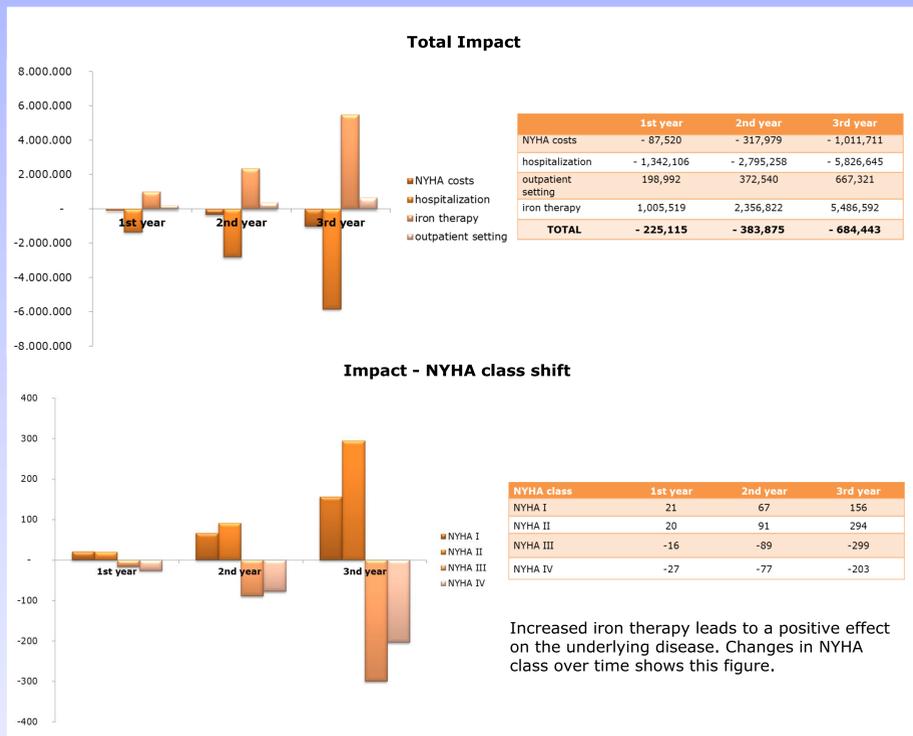
Cost components	Costs in Euro	Source
NYHA costs per year		
NYHA I	3,360	Prices were adjusted to 2014 prices using the consumer price index (Biermann et al. 2012)
NYHA II	3,831	
NYHA III	4,973	
NYHA IV	5,780	
Outpatient costs		
GP		To determine the average rate for Austria, the fee schedules of all nine regional health insurance providers have been used (BGKK, KGKK, NOEGKK, OÖEGKK, SGKK, STGKK, TGKK, VGKK, WGKK). The calculation of the average rates is weighted by population percentages (Statistik Austria 2014).
1 st consultation	16,83	
2 nd consultation	6,71	
3 rd consultation	6,24	
4 th consultation and any further one	5,52	
complete blood count	8,94	
iv injection	5,22	
Inpatient costs per stay		
without iron therapy (depend on NYHA class)	2,156 – 3,641	LKF 2014, Gutzwiller et al. 2012, Biermann et al. 2012
with iron therapy (depend on NYHA class)	1,712 – 2,966	
Iron therapy per year		
ferric carboxymaltose (FCM)	503,90	Drug price list (Warenverzeichnis) 2014, IPF, own calculations
other iv iron therapy	346,19	
oral iron therapy	19,99	

Source: IPF own calculations

Results

The result of the BIA shows that an increased use of iv iron therapy (based on a iv iron treatment scenario- treated patients +20% and iv iron treated patients +10%) in Austria would lead to a positive budget impact. By treating ID with FCM saving effects are achieved through reduced cost in the CHF management (NYHA class shift) and reduced hospitalizations. The overall saving effect was calculated as of € 225,115 in 2014 to € 684,443 in the 3rd year. Fig. 2 demonstrates that the increased use of FCM is able to save money because of the NYHA class shift.

Fig. 2: Results of the BIA



Source: IPF own calculations

Sensitivity Analysis

In the deterministic one-way sensitivity analyses, our results were robust to a wide range of plausible estimates of unit cost data (e.g. NYHA costs, outpatient costs, inpatient costs, costs of iron therapy). Cost savings persisted for the iv treatment strategy FCM in all variations of the sensitivity analyses. Costs for inpatient stay and the drug costs exhibit the great influence on total costs.

Conclusion

Iv iron therapy with FCM in iron deficient CHF patients can be associated with substantial cost savings based on reduced hospitalizations and improved CHF functional class (NYHA).

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Additional Literature with the author

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