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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Objective
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 (MAT 2012, MAT 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 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 subsequently the impact on the health care costs.

The NYHA classification (NYHA I-IV) for a sequential classification of heart failure in certain stages of the disease according to clearly defined criteria.

The Markov model assumed that patients were always in one of the four NYHA states or death referred to as Markov states and that changes from one state to another occur according to a set of transition probabilities. Three transition probabilities depend on the current health state in which the person stood. Patients either remained in NYHA class, improve or deteriorated. Patients could die in each health state.

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 treated patients +10%) in Austria would lead to a positive impact budget. 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.

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. 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).

References
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