EE340

Ferric Derisomaltose Improves Quality of Life and Reduces Costs Relative to Ferric Carboxymaltose in Patients With Inflammatory Bowel Disease and Iron Deficiency Anemia in Italy: Impact of Fractures

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Background

Intravenous (IV) iron therapy is the preferred treatment option for patients with inflammatory bowel disease (IBD) and iron deficiency anemia (IDA), as oral iron preparations are often ineffective. Two IV iron treatments with varying posologies that are commonly used in clinical practice are ferric derisomaltose (FDI) and ferric carboxymaltose (FCM). Numerous clinical studies and randomized controlled trials (RCTs) have established that FCM is associated with a higher incidence of hypophosphatemia than FDI.[1] The impact of the difference in hypophosphatemia incidence across both formulations on their comparative cost-effectiveness has been extensively investigated within previous health economic analyses.[2,3]

One such Italian analysis showed ferric derisomaltose (FDI) to improve quality-adjusted life expectancy and reduce costs versus ferric carboxymaltose (FCM), driven by fewer iron administrations and reduced hypophosphatemia risk.[4] Since this analysis was conducted, emerging data have shown an elevated risk of fractures in patients treated with FCM versus FDI.

The objective of the present analysis was to incorporate these fracture-related data within an updated Italian cost-utility analysis of FCM versus FDI in patients with IBD and IDA.

Methods

A previously-published patient-level simulation model developed to evaluate the cost-effectiveness of various IV iron treatments in IDA was used for this analysis. Data from the PHOSPHARE-IBD RCT (ClinicalTrials.gov ID NCT03466983)[1] were used to model iron need and disease-related quality of life (QoL). Serum phosphate monitoring was modelled in line with the summaries of patient characteristics. Parametric models of fracture-free survival were incorporated into the model based on patient-level time-to-event data. The best model fit was selected based on Akaike information criteria (AIC) and Bayesian information criteria (BIC)

Fracture-related QoL disutilities were identified by reviewing the literature. Costs of fracture treatment, and iron and phosphate administration were based on Italian diagnosis-related groups. The analysis was conducted over a five year time horizon, adopting the perspective of the Italian national payer, with all costs reported in 2024 Euros (EUR). Future effects and costs were discounted at 3.00% *per annum*, and a willingness-to-pay threshold of EUR 25,000 per quality-adjusted life year (QALY) was adopted.

Results

The analysis demonstrated that patients receiving FDI required 1.64 fewer IV iron infusions than patients receiving FCM (requiring 0.41 fewer infusions per treatment course). Furthermore, over the five-year time horizon, FDI was associated with gains of 0.085 QALYs versus FCM, from 2.583 QALYs to 2.668 QALYs per patient (Table 1). Example patient-level QoL trajectories for FDI and FDI are presented in Figure 2.

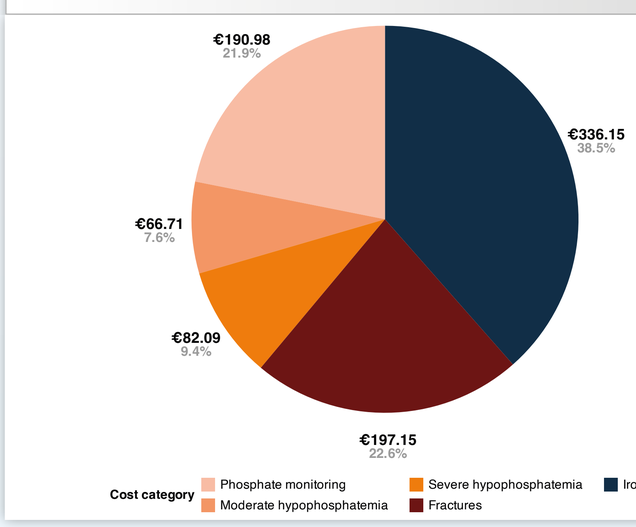
Differences in fracture incidence accounted for 10.6% of the overall QALY difference (0.009 QALYs), with the remainder of the difference made up from an incremental iron infusion disutility of 0.008 QALYs (9.2% of the overall difference) and a health-related QoL difference of 0.0684 QALYs. FDI also led to cost savings of EUR 873 versus FCM, reducing costs from EUR 2,112 to EUR 1,239. Regarding fractures, there was similar fracture risk before and after FDI treatment, while the elevated fracture risk after treatment with FCM contributed EUR 197 to the incremental costs over the FDI arm (Figure 1). FDI was therefore the dominant intervention versus FCM.

Table 2. Iron treatment characteristics

Iron administration metric	FCM	FDI
Total iron treatment courses	3.98	3.98
Total iron infusions per patient	7.34	5.70
Calculated iron need per patient (mg)	6,226	6,279
Mean infusions per treatment course	1.84	1.43

Abbreviations: FCM, ferric carboxymaltose; FDI, ferric derisomaltose; mg, milligrams.

Figure 1. Incremental costs of FCM versus FDI



Sensitivity analysis results

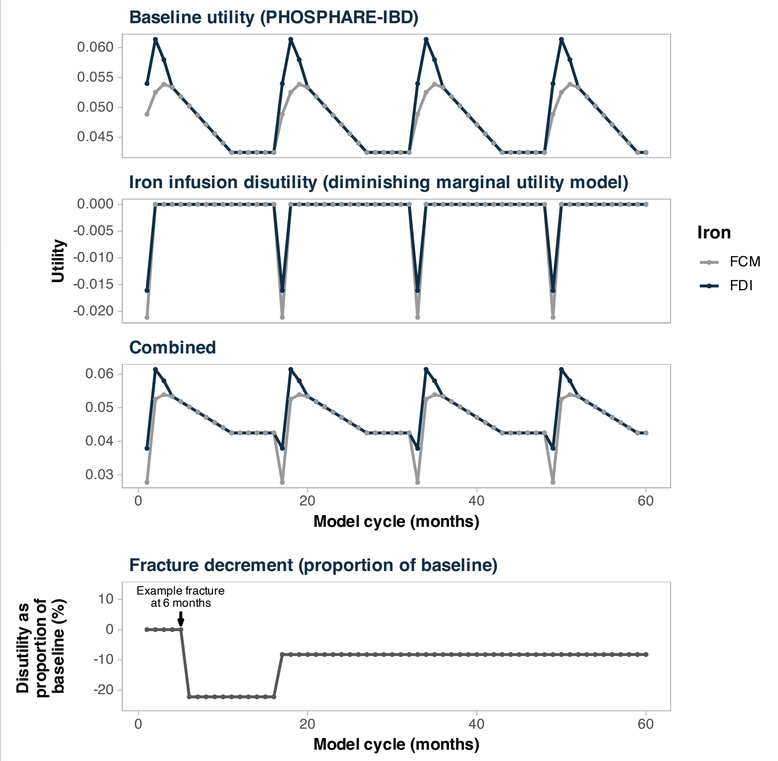
Probabilistic sensitivity analyses

In the probabilistic sensitivity analysis (PSA), all 1,000 ICURs fell within the south-eastern quadrant of the cost-utility plane. FDI showed consistent dominance over FCM, and there was a 100% likelihood of FDI being cost-effective at all WTP thresholds between EUR 0 and EUR 50,000 per QALY gained.

One-way sensitivity analyses

One-way sensitivity analysis (OWSA) results are presented in Figure 3. Baseline bodyweight and hemoglobin had the largest effect on the ICUR, although not to the extent that the conclusion of FDI being dominant was altered. The proportion of patients experiencing severe hypophosphatemia with FCM, the cost of IV phosphate, and the baseline age of the simulated patient cohort all had a negligible effect on the analysis (Figure 3).

Figure 2. Illustrative quality of life trajectories



Trajectories show a patient with a 16-month iron retreatment frequency experiencing a fracture at 6 months.

Conclusion

FDI improved QoL and reduced costs versus FCM for patients living with IBD and IDA in Italy. The inclusion of fractures led to additional QALY gains and further cost savings when compared with a previous Italian analysis, in which FDI was also found to be dominant.

References

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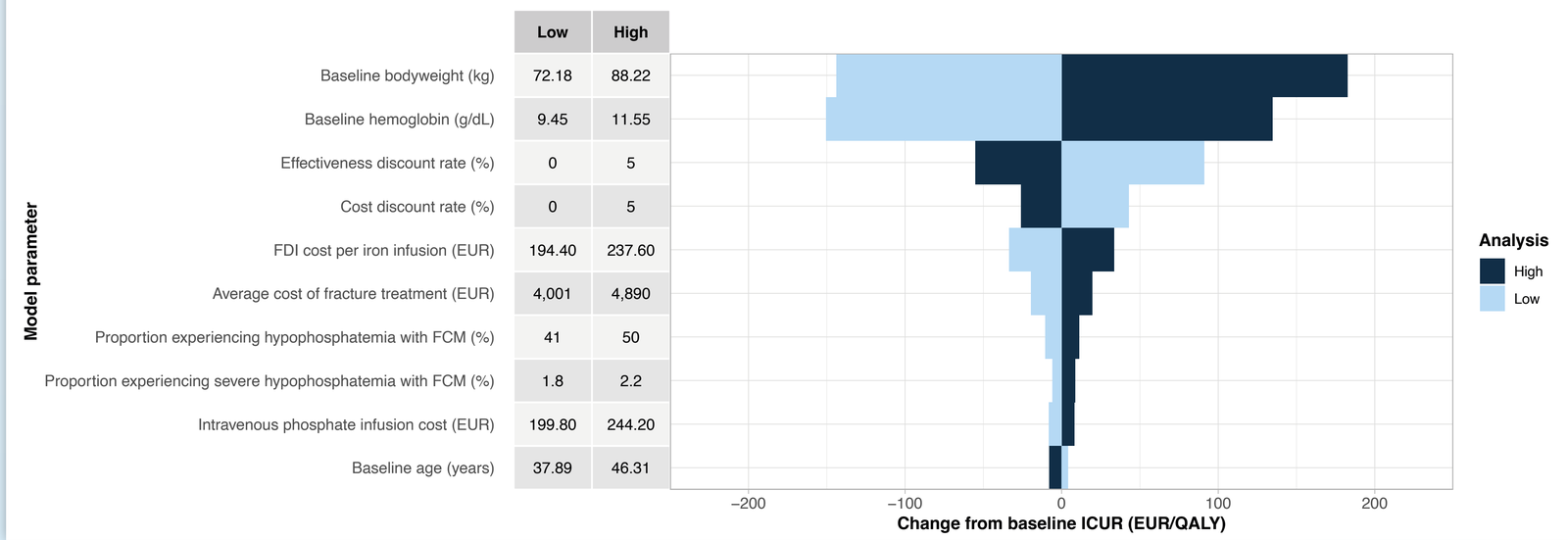
Figure 3. Tornado plot of one-way sensitivity anlaysis results



Abbreviations: EUR, Euros; FCM, ferric carboxymaltose; FDI, ferric derisomaltose; ICUR, incremental cost-utility ratio; IDA, iron deficiency anemia.

Table 1. Health economic results

	Life expectancy (years)	Quality-adjusted life expectancy (QALYs)	Cost (2024 Euros)
Italian national payer perspective			
Ferric carboxymaltose	4.970	2.583	2,112
Ferric derisomaltose	4.970	2.668	1,239
Incremental (ferric derisomaltose)	**0.000**	**+0.085**	**-873**

Acknowledgements

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