Intravenous iron is the preferred treatment for patients with iron deficiency anemia (IDA) who are intolerant of or unresponsive to oral iron, or who need rapid iron replenishment. Two high-dose, rapid-infusion iron formulations are currently available in the UK: ferric derisomaltose (Pheresys, Pharmacosmos A/S, Holbaek, Denmark) and ferric carboxymaltose (VCM, Vifor France, Paris, France).

The two iron formulations have been shown to be equivalent in terms of hematological response, but differ in the approved posology (FDI can be dosed up to 20 mg/kg, while FCM can be dosed up to 20 mg/kg (a limit of 1,000 mg per single dose)) and recent trials have shown a significantly higher incidence of hypophosphatemia after the administration of FCM versus FDI. In 2020, the UK Medicines and Healthcare products Regulatory Agency (MHRA) issued a Drug Safety Update on FCM regarding the risk of symptomatic hypophosphatemia leading to osteomalacia and fractures. Three randomized controlled trials (RCTs) have recently been conducted comparing the two formulations directly; two trials of identical design conducted in general IDA populations, and one trial specifically conducted in a population of patients with IDA associated with inflammatory bowel disease (IBD).

The objective of the present study was to evaluate the cost-utility of FDI versus FCM in patients with IDA in the UK.

### Methods

#### Cost-utility model and clinical data

A previously published patient-level cost-utility model of iron deficiency was used to evaluate the cost-utility of FDI versus FCM in patients with IDA and IBD in the UK. The model was configured to capture differences in the incidence of hypophosphatemia based on the PHOSPHARE-IBD trial, differences in the number of iron infusions required to correct the individually-calculated iron need, and differences in quality of life based on SF-6D utility values derived from the PHOSPHARE-IBD trial (Figure 1).

No differences in hematological response were modeled in line with the finding that there was no significant difference in the change from baseline hemoglobin with FDI versus FCM on the PHOSPHARE-IBD trial. Costs of hypophosphatemia treatment were modeled based on a published treatment algorithm and UK real-world data.

#### Perspective, currency and discounting

The study is an analysis from the perspective of the healthcare payer, NHS England, and ultimately the Department of Health and Social Care (DHSC). Costs were reported in 2022 pound sterling and future cost and effectiveness outcomes were discounted at a rate of 3.5% per annum.

### Results

#### Iron infusions and costs

Patients in both arms received an average of 3.96 courses of iron treatment (consisting of one or more iron infusions) over the five-year time horizon. Patients treated with FDI required 1.52 fewer iron infusions (6.88 versus 7.20 infusions) over the five-year time horizon versus FCM, corresponding to 0.39 fewer infusions per treatment course (5.68 versus 7.20 infusions) over the five-year time horizon. Costs of monitoring and treating hypophosphatemia after treatment with FCM were GBP 308 versus GBP 0 with FDI based on the incidence of hypophosphatemia in the PHOSPHARE-IBD trial and the assumption of no phosphate monitoring requirement with FDI.

#### Cost-utility of FDI versus FCM

Compared with FDI, FCM increased quality-adjusted life expectancy by 0.074 QALYs from 2.571 QALYs to 2.645 QALYs over the five-year time horizon. Overall costs were GBP 2,445 with FCM versus GBP 1,686 with FDI, resulting in FDI dominating FCM with increased quality-adjusted life expectancy and reduced costs.

#### Sensitivity analyses

Probabilistic sensitivity analysis results were used to generate cost-effectiveness scatterplots and acceptability curves (not presented), which showed that there would be a 100% likelihood of FDI being cost-effective versus FCM at willingness-to-pay thresholds from GBP 0–50,000 per QALY gained.

### Conclusion

- The analysis showed that FDI would improve patient quality of life and reduce direct healthcare expenditure versus FCM in patients with IBD and IDA in the UK.
- The FDI cost savings were driven by reductions in the number of infusions required and no need for frequent monitoring and treatment of hypophosphatemia.

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