Evaluation of Discordance and Economic Outcomes Among Patients Using Intravenous Iron in the US

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Background

Anemia is a common health condition in which the number of red blood cells (RBCs) and/or hemoglobin concentration within the RBCs is lower than normal.[1] A common cause of anemia is iron deficiency, known as iron deficiency anemia (IDA), and affects approximately 5 million people in the United States.[2] In a study of 2.3 million health plan members, anemia was observed in 3.5% of the population resulting in 54% higher annualized costs per patient compared to the average cost for non-anemic patients.[3] Intravenous (IV) iron is recommended in patients for whom oral iron therapy is not tolerated or not effective.[4] Several IV iron products are available, including older generation (iron sucrose, iron dextran, and sodium ferric gluconate) as well as newer generation (ferric derisomaltose, ferumoxytol, ferric carboxymaltose) products. The newer generation IV iron products have been shown to better maintain target hemoglobin concentration as well as protect against recurrent events due to anemia.[5,6] Despite the benefits, some payors require failure on older iron products before use of newer iron products in prior authorization processes.

Objective

This study sought to evaluate the discordance to various IV iron products as well as the heathcare cost and resource utilization among those products.

Methods

This was a retrospective study that analyzed claims data from the IQVIA New Data Warehouse. Claims incurred between 20 January 2020 and 31 January 2022 were considered for inclusion. The date of the initial IV iron infusion for each patient served as the index date. All included patients were enrolled in a Medicare plan. Results for iron sucrose and sodium ferric gluconate have been combined due to low utilization of the individual products.

Inclusion Criteria

- Patients with a claim for an IV iron infusion product in the outpatient setting
- Patients with complete linked data available (all sites of care)
- Patients had ≥ 1 medical and prescription claim in the periods prior to as well as following the index date
- Patients had ≥ 6 months of claims data in the periods prior to as well as following the index date
- Patients were ≥ 18 years of age during the year of the first IV iron infusion

Exclusion Criteria

- Patients with data quality issues (i.e., invalid year of birth or gender)
- Patients with evidence of hemodialysis during the pre-index period
- Patients with a claim for an IV iron infusion product during the pre-index period

A **course of therapy** was defined as all infusions within two weeks (inclusive) of the initial infusion.
Discordance to IV iron therapy was defined as having received less than 1,000 mg of iron during a course of therapy.

References

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Discordance to IV iron therapy is prevalent among products requiring multiple doses.

Total cost of care in patients with iron deficiency anemia is not driven by the purchase price of IV iron therapy.

Results

Table 1: Demographics by Product

	Ferric Derisomaltose	Ferric Carboxymaltose	IS/SFG	Ferumoxytol	Iron Dextran
n	50	3,946	1,391	3,211	1,124
Age (years)					
Mean	71.2	72.5	71.5	73.3	71.0
Age Group (n, %)					
18 - 64	12 (24.0%)	562 (14.2%)	247 (17.8%)	388 (12.1%)	199 (17.7%)
65+	38 (76.0%)	3,384 (85.8%)	1,144 (82.2%)	2,823 (87.9%)	925 (82.3%)
Gender (n, %)					
Female	31 (62.0%)	2,564 (65.0%)	892 (64.1%)	2,063 (64.2%)	754 (67.1%)
CCI Categories[a]					
Mean	2.52	1.59	1.74	1.90	1.65
CCI Categories[a] (n, %)					
0	9 (18%)	932 (24%)	287 (21%)	650 (20%)	263 (23%)
1	11 (22%)	491 (12%)	146 (10%)	357 (11%)	131 (12%)
2	8 (16%)	885 (22%)	293 (21%)	689 (21%)	254 (23%)
3+	22 (44%)	1,638 (42%)	665 (48%)	1,515 (47%)	476 (42%)

[a] Charlson Comorbidity Index (Dartmouth-Manitoba Adaptation), calculated in pre-index period
IS = Iron Sucrose; SFG = Sodium Ferric Gluconate

Table 2: Discordance By Product

Ferric Carboxymaltose	Ferric Derisomaltose	IS/SFG	Ferumoxytol	Iron Dextran
56%	0%	95%	55%	64%

IS = Iron Sucrose; SFG = Sodium Ferric Gluconate

Table 3: Total Cost of Care[b]

	Ferric Derisomaltose	Ferric Carboxymaltose	IS/SFG	Ferumoxytol	Iron Dextran
Concordant	$55,590	$74,869	$70,933	$71,790	$66,615
Discordant	*n/a*	$78,977	$84,983	$70,890	$75,743
Difference	*n/a*	$4,108	$14,050	-$900	$9,128

[b] Total cost of care includes all costs paid by the health plan regardless of diagnosis, type, or place of service
IS = Iron Sucrose; SFG = Sodium Ferric Gluconate

- There were 9,722 patients enrolled in the study
- Average age was roughly equivalent, but ferric derisomaltose had a higher proportion of patients aged 18 - 64
  - Since this was a Medicare population these patients were likely to have disabilities that are not included in the comorbidity index
- The population consisted of more females than males
- The ferric derisomaltose cohort has the highest pre-index comorbidity burden
- Patients who used the newer generation IV iron products had lower rates of discordance than those with older generation products
- Patients who used iron sucrose or sodium ferric gluconate had the greatest discordance at 95% as well as the largest difference in total cost of care between patients who were concordant versus those who were discordant
- Patients who used ferric derisomaltose were associated with the lowest overall total cost of care

Conclusion/Discussion

In this study, rates of discordance were lower for the newer generation IV iron products. In general (except ferumoxytol), discordance to therapy was associated with a higher overall total cost of care. These patterns are consistent with a previous study that considered a commercially insured population[7]. This indicates that patients who receive the newer generation IV iron products (ferric derisomaltose, ferric carboxymaltose, ferumoxytol) are more likely to complete a course of iron therapy to treat their IDA.

Ferric derisomaltose was associated with the lowest total cost of care followed by iron dextran. The total cost of care in patients with IDA is not driven by the purchase price of IV iron therapy (ASP, AWP, etc.). This would suggest that steps required through less costly IV iron products may not provide cost savings as intended.

Limitations

- This study was completed using administrative claims data. This data does not contain laboratory results so actual iron need was not able to be calculated
- The categorization of concordance was dependent on an algorithm that utilized assumptions for the interpretation of billed units of service and multiple claims with the same date of rendered service
- The results included on this poster were not adjusted to account for confounding variables
- These results are based on patients enrolled in Medicare programs and may not be applicable to other populations such as those with Medicaid or commercial insurance
- The sample size for ferric derisomaltose was low (*n* = 50) compared to the other products
- The study timeline includes the COVID-19 pandemic. No sensitivity analyses were performed to estimate the impact of the pandemic on the results of this study

Presented at AMCP 2023, San Antonio, TX

Study sponsored by Pharmacosmos Therapeutics Inc.