Utilization and Tolerability of Intravenous Iron in Home Infusion Patients

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Background

Iron deficiency is one of the most common nutritional deficiencies in the world, accounting for 50% of all anemias worldwide.[1] Intravenous (IV) iron therapy is an alternative for patients unable to tolerate or adequately respond to oral iron supplementation. While IV iron therapy may reduce the risk of gastrointestinal adverse effects compared to oral iron, it can increase the risk of neurological adverse events, hypotension, electrolyte abnormalities (hypophosphatemia), infections, and allergic reactions. Though rare, hypersensitivity reactions to iron therapy may be life threatening.[1,2]

There are many diverse types of IV iron products on the market with varying safety profiles. The oldest IV iron products were high molecular weight iron dextran complexes such as Imferon® and Dexferrum® which were associated with high rates of adverse events and have been discontinued. Most frequently administered iron formulations include low molecular weight iron dextran (Infed®), iron sucrose (Venofer®), ferumoxytol (Feraheme®), ferric carboxymaltose (Injectafer®), ferric derisomaltose (Monofer, Monoferric®), and sodium ferric gluconate (Ferrlecit®).[3,4,5,6,7,8,9] Iron dextran and ferumoxytol have a boxed warning for anaphylactic reactions and iron dextran requires a test dose prior to the first therapeutic dose.[5,8] Other common side effects to IV iron include hypotension, flushing, rash, hypophosphatemia, and gastrointestinal symptoms.[4,5,6,7,8,9]

Purpose

The research aims to provide evidence-based insights into clinical utility of different intravenous iron products in the home setting that can inform treatment decisions, enhance patient care, and potentially influence payor policy related to home infusion services. The primary objectives of this study are to assess the usage of intravenous iron therapy in home infusion patients with a specific focus on identifying the types of products used in the home and analyzing the rate of tolerability reported. The products that will be reviewed are iron dextran, iron sucrose, sodium ferric gluconate, ferumoxytol, and ferric carboxymaltose.

Methods

A retrospective, multi-center chart review spanning a 2-year period of dispenses of IV iron was conducted. Patients aged 18 years and older receiving intravenous iron therapy were included. Data was collected from the patients' electronic medical record and internal surveillance software. Baseline demographics, iron formulation, and details of adverse drug reactions were reviewed. This study was determined to be exempt by IRB.

References

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Figure 1: Percentages of the different IV iron products used during the study period.

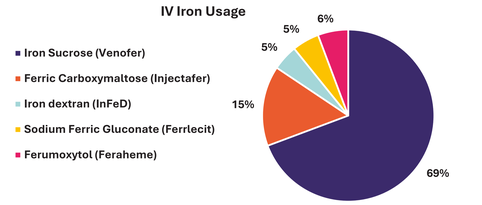


Figure 2: Most utilized doses of IV iron products.

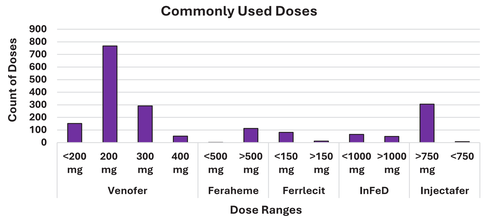
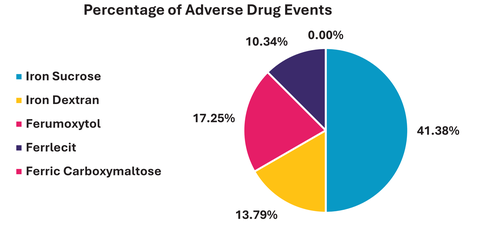


Figure 3: Percentage of ADRs associated with each IV iron product analyzed



Disclosures

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation: Fatima Farrukh; Kiersten Clark; Christopher Roy: Nothing to disclose.

Results

A total of 2494 patients received IV iron over 33 months. Among these patients, 2101 patients were 18 years of age and older and were included in this study. Among the 2101 patients, 1456 patients received iron sucrose (Venofer ®), 317 patients received ferric carboxymaltose (Injectafer ®), 101 patients received iron dextran (InFeD ®), 107 patients received sodium ferric gluconate (Ferrlecit ®), and 120 patients received ferumoxytol (Feraheme ®). *(Figure 1)*

The most common diagnosis for IV iron products was iron deficiency anemias (43.6%). Crohn's disease, unspecified anemias, and anemias due to blood loss were among the other common diagnoses. IV iron was also used for various other diagnoses such as diseases associated with the GI tract, complications of pregnancy, chronic kidney disease, ulcerative colitis, and infections.

The most common dose utilized was 200 mg of iron sucrose followed by 300 mg and 100 mg. For ferric carboxymaltose, the most common dose utilized was 750 mg. *(Figure 2)*

During the study period, there were 29 adverse drug reactions (ADR) reported for patients receiving IV iron. Among the 29 ADRs, 12 were associated with iron sucrose and 5 were associated with both ferumoxytol and ferric carboxymaltose. Iron dextran was associated with 4 ADRs and ferric carboxymaltose was associated with 3 ADRs. Among the 29 ADRs, 16 patients received an intervention and/or monitoring at home, 11 patients were sent to the emergency department (ED), and 2 patients were admitted to the hospital. *(Figure 3)*

Six patients receiving iron sucrose required intervention or monitoring at home due to an adverse drug reaction whereas five patients were sent to the ED. One patient receiving iron sucrose was admitted to the hospital for further monitoring.

Among the safety events reported, iron sucrose had the highest event rate which coincides with the high usage of iron sucrose in the home setting as 1456 patients received iron sucrose. When comparing the total number of patients receiving IV iron products, the overall adverse event rate was the highest with iron dextran and ferumoxytol. Iron sucrose had the lowest rate of adverse event at 0.8%.

Patients that required intervention reported various allergic symptoms such as hives, itching, rash chest tightness, difficulty breathing, swelling, flushing, dizziness, burning sensations, numbness and tingling. Most common intervention included diphenhydramine 25 mg slow IV push. Other interventions included 0.9% sodium chloride 500mL bolus, solumedrol IV push, IV prednisone, acetaminophen, cetirizine, and famotidine 20 mg.

Discussion

Iron sucrose (Venofer ®) was used frequently in the home setting, encompassing 69% of all patients receiving IV iron in the study period. Iron dextran (InFeD ®), sodium ferric gluconate (Ferrlecit ®) and ferumoxytol (Feraheme ®) were among the less commonly IV iron products. IV iron products were used for several diagnoses such as iron deficiency anemias, followed by Crohn's disease, anemias due to blood loss and unspecified anemias. Various conditions affecting the GI tract were seen as common diagnosis requiring IV iron as well. Iron sucrose 200 mg was a frequently utilized dose followed by 300 mg and 100 mg. This is consistent with the package insert as the recommended dose of iron sucrose for iron-deficiency anemia is 100 mg to 300 mg per dose.

Overall tolerability of IV iron was high as 29 patients had an adverse drug event reported during the study period. A limitation of the study was that the safety event reporting was voluntary and may not reflect all the events that occurred during the study period. Among the safety events reported to the internal safety surveillance software, iron sucrose was associated with 12 out of 29 ADRs. This result aligns with the high usage of iron sucrose in the home setting at 69% (1456/2101). The second highest safety event rate was associated with ferumoxytol and ferric Carboxymaltose at 17% (5/29). The overall adverse event rate was the highest with iron dextran and ferumoxytol at 4%. Iron sucrose had a low rate of adverse event at 0.8%.

Conclusions

This study highlights the clinical utilization of IV iron in the home infusion setting. Iron sucrose was utilized more than other products in the home setting and had a low incidence of ADR. Among the iron products analyzed, iron dextran and ferumoxytol were associated with a high rate of ADRs compared to other products. Overall, IV iron was found to be well tolerated in the home setting when used for various diagnoses in a diverse population of patients.

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