Ferric Derisomaltose Use in Non-Dialysis Chronic Kidney Disease and Independent Dialysis Patients at Vancouver General Hospital

Karen Shalansky, Pharm.D., **Kevin Kwok,** Pharm.D., **Hilary Wu,** Pharm.D., **Elena-Bianca Barbir,** M.D., PGY4 Nephrology

Background

- Iron deficiency anemia requiring iron supplementation is a common condition in chronic kidney disease (CKD)
  - Oral iron is limited by issues with tolerance, adherence and efficacy
  - IV iron formulations include: iron sucrose, sodium ferric gluconate and **ferric derisomaltose (Monoferric©)**
- Ferric derisomaltose is a new IV iron option in Canada
  - Low content of labile and free iron reduces immunogenic potential, allowing for larger single doses to be given over a shorter period of time
  - Benefits include: quicker time to reach repletion dose, larger single dose, one hospital visit, preservation of peripheral vasculature for potential fistula formation
  - Rate: 15 mL/hr x 20min then 120 mL/hr
    - Slower than monograph to reduce risk of Fishbane reactions (flushing, tightness or pain in back/chest)

Objectives

- To evaluate the efficacy and safety of ferric derisomaltose in non-dialysis CKD (ND-CKD) and independent dialysis (PD and HHD) patients
- Primary Endpoints: changes in Hgb, ferritin, and TSAT
- Secondary Endpoints: adverse events, changes in doses of erythropoiesis-stimulating agent (ESA) and oral iron

Methods

- **Study period**: November 1, 2019 – December 31, 2021
- **Inclusion**:
  - VGH Independent dialysis (PD, HHD) or ND-CKD patients
  - Minimum of one dose of ferric derisomaltose administered
- **Data collection**: PROMIS database, patient charts
  - Labs: baseline, then closest value to 4 weeks post-dose (range 1-20 weeks)
- **Monitoring:** vital signs pre-infusion, 20 minutes into infusion and 30 minutes post-infusion
- **Statistics**:
  - Descriptive statistics
  - Paired 2-tailed t-test; p<0.05 considered significant

Inclusion Flow Diagram

72 patients ordered Ferric Derisomaltose

11 patients **excluded** as never received dose
- 4 – workload issues for scheduling dose
- 2 – refused to go to hospital
- 1 – repeat iron studies normal, dose cancelled
- 1 – missed appointment
- 1 – transferred to St. Paul's Hospital, received dose there
- 1 – transferred to in-center hemodialysis
- 1 – order missed

61 patient **received** Ferric Derisomaltose (68 **courses** total)

Results

Baseline Characteristics	**N=61 patients**
Male, n (%)	35 (57.4)
Age (years), mean (SD)	70.9 (15.2)
Weight (kg), mean (SD)	75.1 (17.1)
Allergies (no.), median (range)	0 (0-2)
Type of Patient, n (%)	
Non-Dialysis CKD	45 (73.8)
Peritoneal Dialysis	15 (24.6)
Home Hemodialysis	1 (1.6)
Patients on ESA Prior to Ferric Derisomaltose, n (% of ESA users)	32 (52.5)
Darbepoetin (Aranesp®)	30 (93.8)
Epoetin alfa (Eprex®)	2 (6.2)
Patients on Oral Iron Prior to Ferric Derisomaltose, n (% of oral iron users)	36 (59.0)
Ferrous fumarate	30 (83.3)
Ferrous sulfate	1 (2.8)
Iron polysaccharide (Feramax®)	2 (5.5)
Ferrous gluconate	3 (8.3)
Ferric Derisomaltose Dosage, n (%)	**N=68 courses**
500 mg x 1	14 (20.6)
1000 mg x 1	51 (75.0)
500 mg weekly x 2	1 (1.5)
1000 mg weekly x 2	2 (2.9)

Primary Endpoints

Parameter	Pre-Ferric Derisomaltose	Post-Ferric Derisomaltose	Difference	P-Value	Median Time for Repeat Lab (range)
Hemoglobin (g/L), mean (SD) [n=67 infusions]	95.8 (16.0)	108.4 (16.6)	+12.6	<0.0001	74 days (25-137)
Ferritin (mcg/L), mean (SD) [n=59 infusions]	172.7 (167.6)	483.4 (373.7)	+310.6	<0.0001	73 days (9-138)
TSAT (%), mean (SD) [n=60 infusions]	0.14 (0.05)	0.23 (0.08)	+0.09	<0.0001	75 days (9-140)

Secondary Endpoints

Drug	Pre-Ferric Derisomaltose	Post-Ferric Derisomaltose	P-Value
Darbepoetin (mcg/week), mean (SD) [n=14 IV iron courses]	36.6 (31.7)	30.2 mg (22.2)	0.08
Epoetin alfa (units/week), mean (SD) [n=3 IV iron courses]	9,000 units (5567.8)	8,000 units (2000)	0.68
Oral Iron (per day), mean (SD) [n=35 IV iron courses]	164.2 mg (107.8)	149.9 mg (126.3)	0.32

Adverse Event	**N=71** [a]
No adverse reactions noted by nurse	63 (88.8%)
Dizziness	2 (2.8%)
Headache	2 (2.8%) [b]
Hypotension (>30% or >20 mmHg drop in baseline systolic BP)	1 (1.4%) [c]
Paresthesia	1 (1.4%)
Stomach upset	1 (1.4%)
Right-Sided Chest Pain	1 (1.4%) [d]
Anaphylaxis	0
Fishbane reactions	0

[a] 7 patients received 2 courses of ferric derisomaltose 5-21 months apart; 1 pt had ADR on second infusion of 1000 mg (hypotension)
[b] 1 patient with headache resolved with acetaminophen
[c] 1 patient developed asymptomatic hypotension and was discharged home without treatment
[d] 1 patient experienced right-sided chest pain which resolved without treatment

Strengths

- First Canadian study to evaluate IV ferric derisomaltose in independent dialysis and ND-CKD patients
- Clear documentation of adverse events for all patients during infusion by nurses in chart
  - Explicitly noted by nurses if patient had no signs and symptoms of adverse reactions to ferric derisomaltose

Limitations

- Retrospective chart review
- Small sample size
- Surrogate outcomes
- Variable timing and completeness of follow-up labs

Conclusion

- Single dose of ferric derisomaltose resulted in statistically significant increases in Hgb, ferritin, TSAT
- Generally well tolerated:
  - Adverse events occurred with 8 (11.3%) infusions
  - No major interventions required for any adverse event
- BC Renal Agency approval for iron isomaltoside:
  - Intolerance or poor response to oral iron *AND*
  - Hemoglobin <110 g/L *AND* TSAT <20% *AND*
  - Total dose exceeds 300 mg IV iron

Vancouver CoastalHealth — Promoting wellness. Ensuring care.

BCRenal