

Evaluation and Management of Iron Deficiency (ID) With and Without Anemia in General Internal Medicine (GIM) Clinics: A Retrospective Cohort Study

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Background

- Iron deficiency anemia is the most common cause of anemia worldwide, contributing up to 50% of all anemia^{1,2}
- Oral iron supplementation used as first line iron supplementation in the majority of patients³
- There remains a wide variability in practice as to when intravenous iron should be administered due to its practicality, cost, and resource allocation⁴

Diagnostic criteria for iron deficiency⁵:

- If no inflammatory conditions: Ferritin <45 µg/L
- If concomitant inflammatory condition or chronic disease:
Ferritin < 200 µg/L with either :
Transferrin saturation < 20%, OR
Reticulocyte hemoglobin < 28

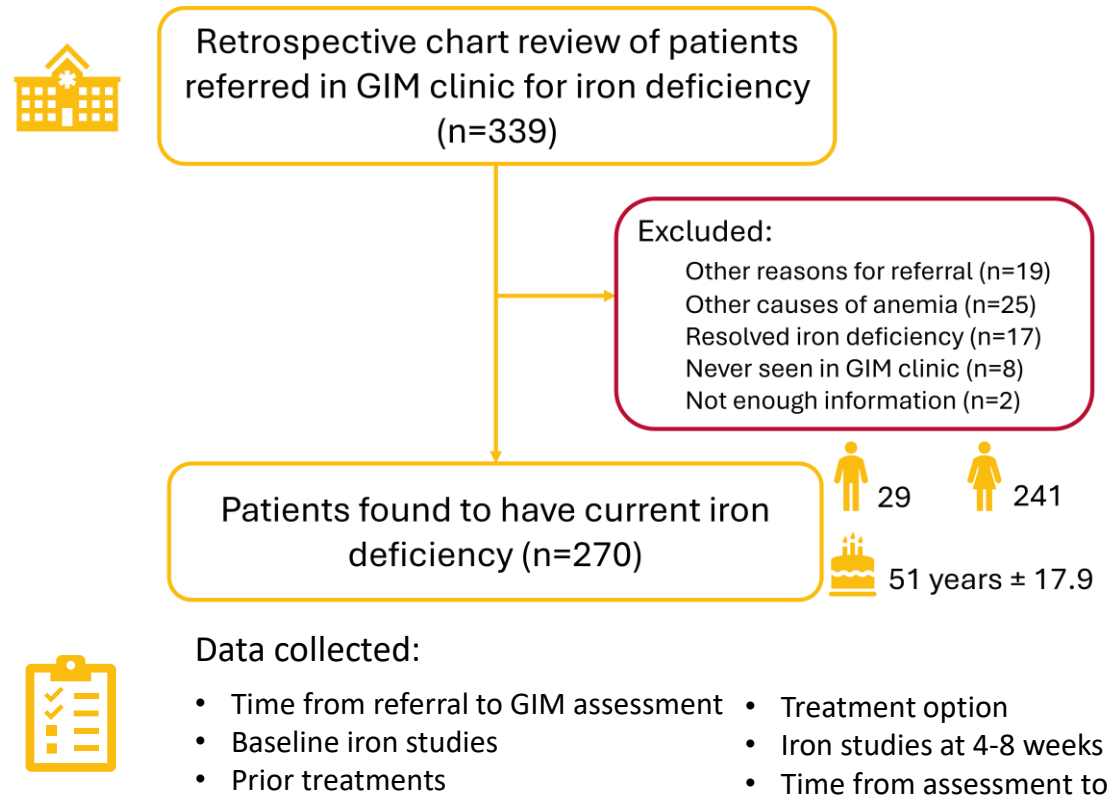
Diagnostic criteria for iron deficiency anemia⁵:

1. Iron studies meet criteria for iron deficiency, AND
2. Hemoglobin < 130 g/L in males, < 120 g/L in females

Objective

We aimed to study current local practices in the evaluation and management of iron deficiency anemia amongst GIM providers in Kingston after the implementation of the Primary Care Management Pathway for Iron Deficiency Anemia in May 2022.

Methods



Results

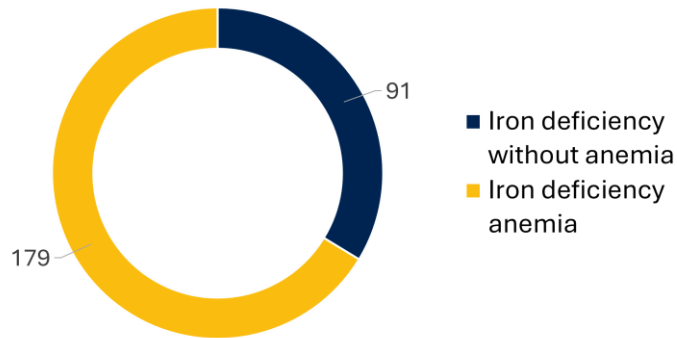


Figure 1: Proportions of cohort who had iron deficiency with and without anemia. 179 (66%) of patients had iron deficiency with anemia, and 91 (34%) of patients had iron deficiency without concurrent anemia.

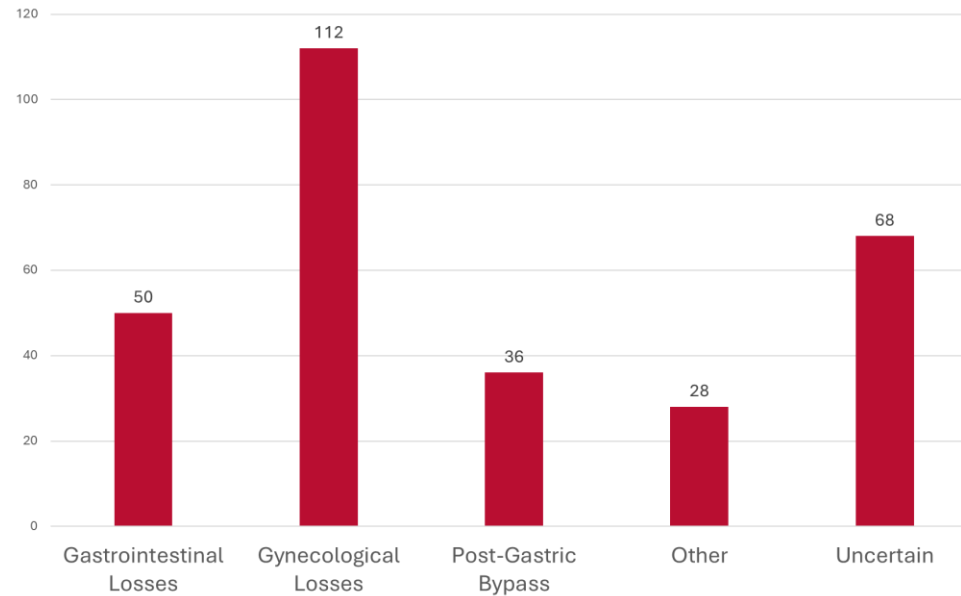


Figure 2: Causes of iron deficiency. Gynecological losses through menorrhagia was the most common cause of iron deficiency, with rate of 41%, followed by gastrointestinal bleeding (19%), and malabsorption after gastric bypass surgery (13%). Other causes of iron deficiency included celiac disease, other hemorrhagic causes (post surgical, hematuria, epistaxis), and other malabsorptive causes.

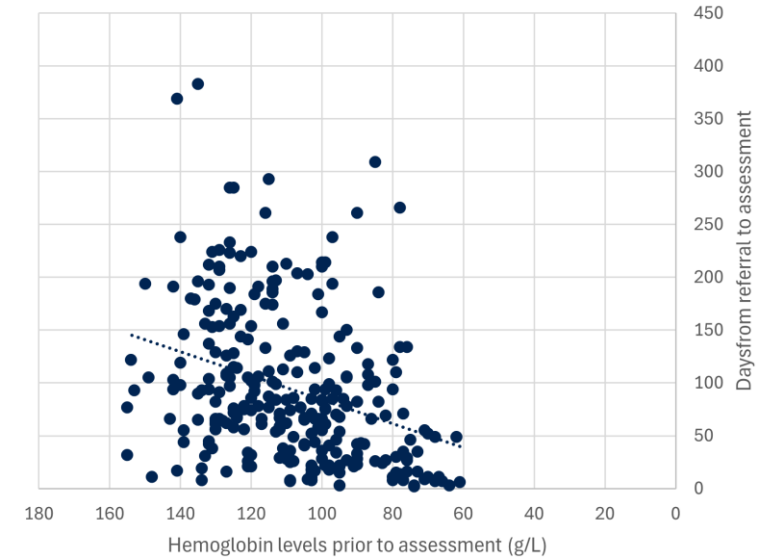


Figure 3: Wait times from referral to GIM clinic assessment versus baseline hemoglobin levels. Significant correlation seen between hemoglobin levels and time to be seen in GIM clinic, with average wait time of 59 days (± 65.7) if hemoglobin $< 90\text{g/L}$ and 102 days (± 71.3) if hemoglobin $\geq 90\text{g/L}$ ($p < 0.001$).

Results

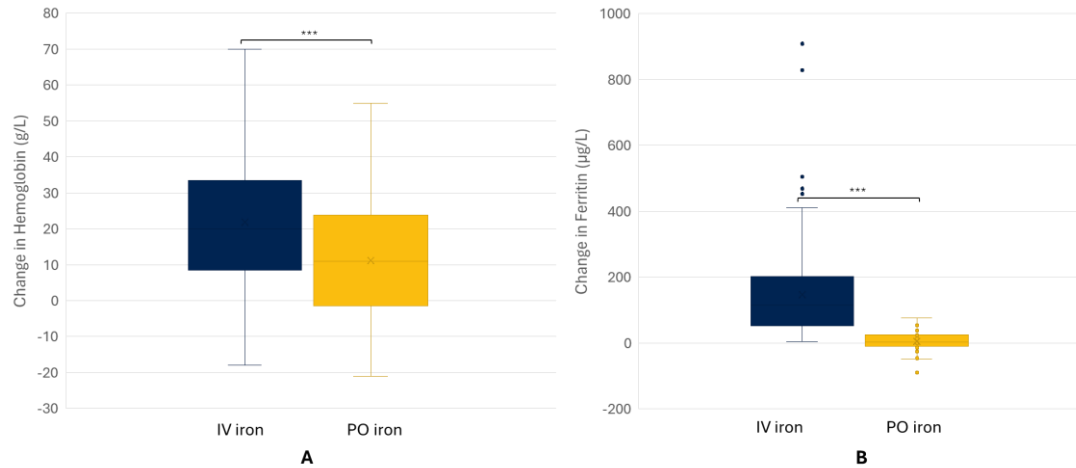


Figure 4: Post treatment iron indices. Abbreviations: PO = per os, IV = intravenous.

(A) Change in hemoglobin in IV versus PO iron. IV iron patients improved their hemoglobin on average of 10.34 g/L compared to PO iron patients at 4-8 weeks ($p=0.005$).

(B) Change in ferritin in IV versus PO iron. IV iron patients had on average of 134 µg/L greater increase in ferritin levels compared PO iron patients at 4-8 weeks after treatment ($p<0.001$).

- 90.7% of patients were treated with oral iron prior to GIM assessment.
- 81.5% of patients were planned to receive intravenous iron after GIM assessment.
- The most common intravenous iron supplementation used was **Ferric Derisomaltose 1000mg** (59.8%).
- Rate of adverse reactions with IV iron infusion was 1.1% ($n=3$) with cases consisting of:
 - Pruritus at site of infection
 - Syncope and back pain
 - Dizziness, coughing, diaphoresis, nausea and dyspnea

Conclusion and Next Steps

- High rate of intravenous iron supplementation once patients are seen in GIM clinic, suggesting that patients are being appropriately referred
- Intravenous iron was generally well tolerated with low rates of adverse events
- Strong correlation between hemoglobin levels and time to be seen in GIM clinic suggests adequate triaging of new referrals
- Further analysis could be performed to identify prognostic factors that could indicate which patients should be seen on a more urgent basis
- Consideration could be made about expanding IV iron privileges to other specialists (e.g. Gynecology, Gastroenterology) who see patients with iron deficiency anemia in clinic to improve wait times for assessment

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Evidence of Conflict of Financial Interest

	Co-author	Conflict Disclosures
1	Stellar Lim	No conflicts to disclose
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4	Marie Leung	No conflicts to disclose