Are IM Residents Are Following AHA/ACC Guidelines for Screening and Managing Iron Deficiency in Heart Failure Patients

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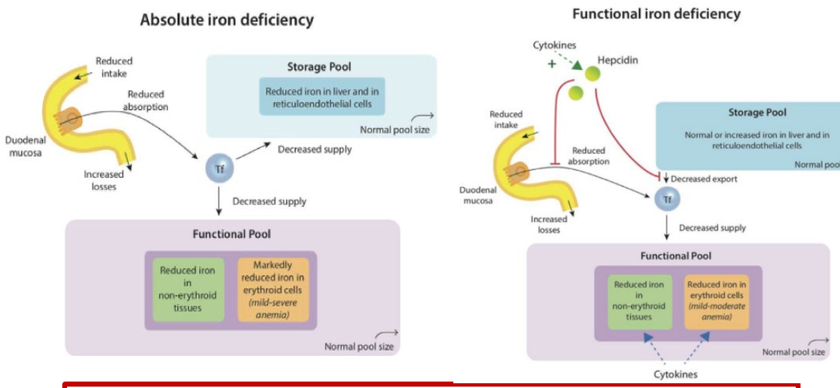
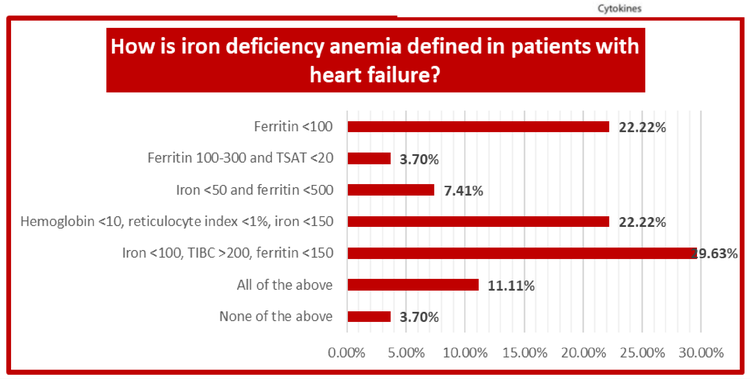
Background

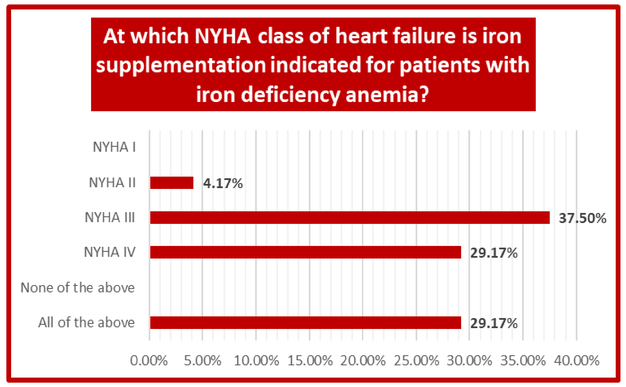
Anemia is independently associated with increased mortality and hospitalizations in patients with both heart failure with reduced ejection fraction (HFrEF) and heart failure with preserved ejection fraction (HFpEF). The most common cause of anemia in patients with heart failure (HF) is iron deficiency anemia (IDA). However, even in the absence of anemia, nearly 50% of patients with HF, regardless of sex, race, anemia, and LVEF, have IDA. Therefore, IDA but not anemia, remains a strong independent predictor of mortality in patients with HF. Several studies have shown that IDA in patients with HF is associated with reduced exercise capacity, impaired quality of life (QoL), and poor prognosis independently of anemia and LVEF. Our study aims to assess resident competency with guideline-directed management of ID in HF, enhance adherence to guidelines, and improve outcomes.

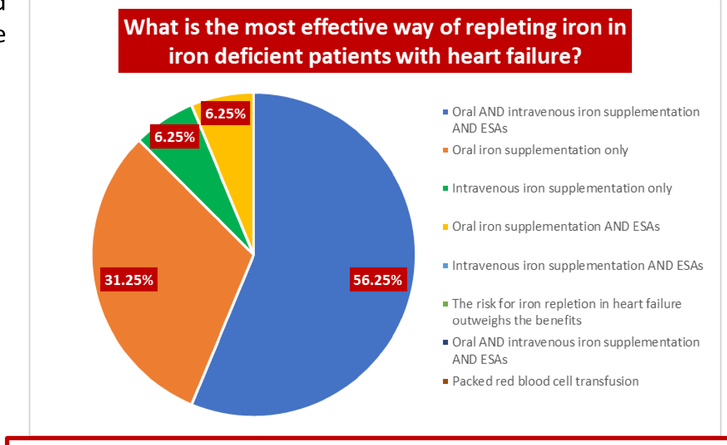


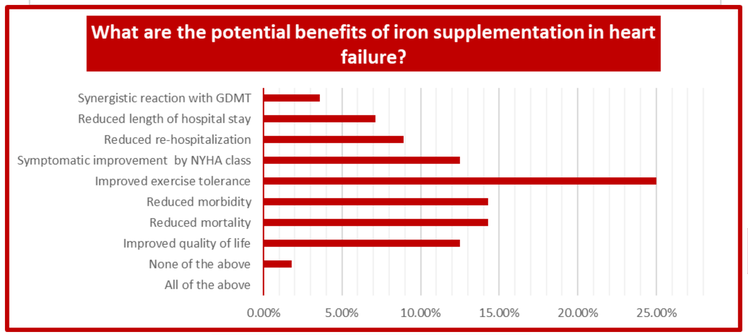


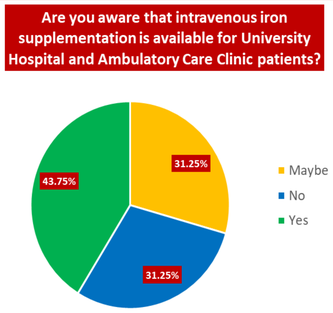
Methods

Retrospective chart review of randomly selected sample of 150 patients from the ACC clinic from 1/2017-1/2022 was performed. All patients aged 18-75 with NYHA class II-IV symptoms were included and any patient with significant liver disease (I.e.) cirrhosis, ESRD, and/or active malignancy were excluded. Resident competency was assessed with a short quiz, followed by an evidence-based medicine solution guide for review.









Results

A multiple choice and multiple answer resident competency survey was sent via email and QR code to Internal Medicine residents. While 75.9% and 100% of respondents correctly identified an adverse drug reaction to oral iron and IV iron respectively, this was only 68.8% and 39.6% of possible correct responses. Similarly, while 91.7% and 100% of responds correctly identified a correct formulation of oral and IV iron, this was only 36.7% and 19.8% of possible correct responses. Only 25.9% correctly identified ID, 22% correctly identified NYHA class, 29.2% correctly identified the need for iron supplementation at any NYHA class for ID, 6.25% identified IV iron alone as the preferred therapy, 33.1% identified benefits of IV iron therapy, and 43.8% were aware IV iron is available at UH. All survey participants reviewed the evidence-based medicine solution guide.

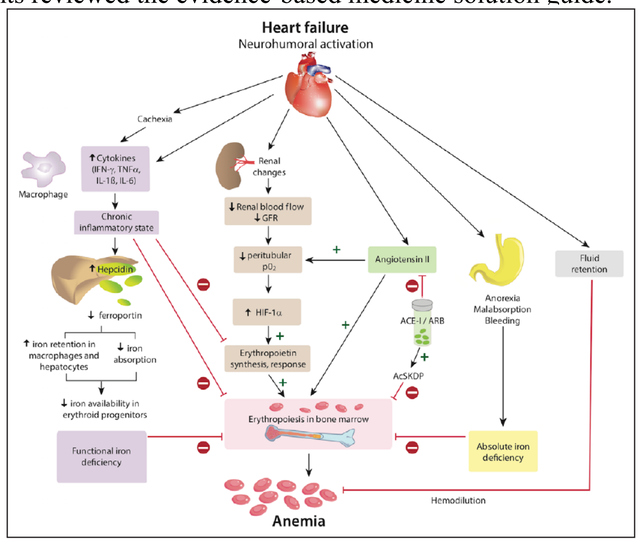


Figure 1. Potential mechanisms involved in the pathogenesis of anemia in heart failure (HF).
Multiple, interrelated mechanisms contribute in various degrees to the development of anemia in HF. Of these, functional or absolute iron deficiency, erythropoietin synthesis and response, and the effects of various medications may represent the most important factors. ACE-I indicates angiotensin-converting enzyme inhibitor; AcSDKP, *N*-acetyl-seryl-aspartyl-lysyl-proline; ARB, angiotensin receptor blocker; GFR, glomerular filtration rate; HIF-1α, hypoxia-inducible factor-1α; IFN-γ, interferon-γ; IL, interleukin; and TNF-α, tumor necrosis factor-α.

Conclusion

IDA is preventable, under-recognized and under-treated phenomena in patients with HF. Several studies provide encouraging data that intravenous but not oral iron therapy has a role in patients with HF and absolute or functional iron deficiency with or without anemia. Our study suggests there are serious gaps in the evidence-based diagnosis and management of ID in HF. This presents an important area for improvement in outcomes for patients with ID in HF. Our survey results show that while many of our trainees mean well and are proactive in the management of their patients, many lack understanding of current evidence-based management for ID in HF. After reviewing the evidence-based medicine solution guide, our trainees are better equipped to recognize, manage, and improve outcomes of ID in HF..

Citations:
1Sawicki KT, Ardehali H. Intravenous Iron Therapy in Heart Failure WithReduced Ejection Fraction: Tackling the Deficiency. Circulation (New York, NY). 2021;144(4):253-255. doi:10.1161/CIRCULATIONAHA.121.054271.2Camaschella C. Iron-Deficiency Anemia. The New England journal of medicine. 2015;372(19):1832-1843. doi:10.1056/NEJMra1401038
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[3]Yancy CW, Jessup M, Bozkurt B, et al. 2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Failure Society of America. Journal of the American College of Cardiology. 2017;70(6):776-803. doi:10.1016/j.jacc.2017.04.025.