ELSEVIER

Blood 142 (2023) 3690–3691

The 65th ASH Annual Meeting Abstracts

POSTER ABSTRACTS

901.HEALTH SERVICES AND QUALITY IMPROVEMENT - NON-MALIGNANT CONDITIONS

E-Iron: An Asynchronous Telemedicine Referral Platform for Management of Anemic Pregnant Patients and the Expediting of Treatment with Intravenous Iron

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Introduction:
Intravenous iron (IVI) is a valuable but underused strategy in the management of iron deficiency anemia in pregnancy, a common condition linked to adverse maternal and neonatal outcomes. At our institution and elsewhere, administration of IVI has historically entailed referral to hematology, a frequently slow and labor-intensive process, that commonly results in significant delays, thus undermining the usefulness of this intervention.
E-Iron is a specialized e-consult protocol operational at our institution, built into the EPIC EMR, and designed to facilitate 'electronic' referral of patients requiring IVI.
Using a template-based design, e-IRON assists referring providers with the gathering and electronic submission of key clinical information required to determine eligibility for IVI. Following submission, a hematologist reviews the request within 3 days. If IVI is deemed appropriate, it is promptly scheduled, as is a face-to-face appointment if deemed necessary. Where IVI is not deemed appropriate, guidance as to alternate management is provided.
We have previously shown that e-IRON, by dispensing with the need for a face-to-face hematology visit, simplifies the process of referral for IVI across a broad range of indications, and significantly accelerates the administration of IVI when appropriate. Here we report on the characteristics and selected outcomes of a cohort of anemic pregnant women referred to the e-IRON program over an 18-month period.
Results:
From July 2021 until December 2022, 239 patients were referred. Of these, 18 were excluded from our analysis due to absence of follow up data.
The vast majority (84%) of referrals occurred in the 3rd trimester, the median number of days prior to estimated date of delivery being 47, (average 54.7 days)
IV iron was approved for 149 patients (67% of total referred). Of these, 132 patients (89%) received infusion, *which occurred a median of 13 days (IQR: 9.4 - 17.5) after the e-IRON consult was placed.*
Reasons for non-administration included "no shows" (60%) and intervening delivery (33%).
Treatment consisted of 'single dose infusion' in 88% of infused patients, either using iron dextran 1g, - *the Georgetown regimen* - (68%), or iron carboxymaltose 750 mgs (19%).
No significant complications relating to infusions were reported.
IVI was not approved where deemed to be without utility (63%), notably, if the patient was not iron deficient, if the request was too close to delivery, or if anemia was mild. In such cases consideration for IVI during admission for delivery was recommended to expedite post-delivery Hb recovery. IVI was not approved if laboratory studies were not current (11%) or if failure of oral iron was not demonstrated (26%). In the latter group of 19 patients a trial of oral iron was recommended, deemed successful in 10, but in whom 7 ultimately proceeded to IVI.
A face-to-face hematology consultation was recommended in 7 patients (3%).
36 patients in the cohort (16%) had a history of bariatric surgery. IVI was approved in 89% of this group, versus 63% in patients without this history.
Effects of the intervention are shown in Table 1, with a notable decrease in the proportion of anemic women at time of delivery, most marked in the group who received IVI. The improvement in Hb was greater the earlier IVI was administered.
Transfusions occurred exclusively in the context of post-partum hemorrhage, and predominantly with surgical delivery (Table 2). Rates in the cohort were higher than in a historical control (12.2% vs 5.2%). This was attributed to selection bias; e-IRON referrals occurring in a higher pregnancy risk cohort.

Conclusions:
E-IRON represents a successful implementation of an electronic, asynchronous, telemedicine protocol, that facilitates rapid triage and treatment of anemic pregnant patients requiring IVI. We have shown that the earlier infusion is administered, the greater the increment in Hb, which underscores the value of a protocol that minimizes the time interval between referral and infusion. The speed of IVI administration since implementation of e-IRON is unprecedented at our institution. We believe the model is easily replicated, and can be readily implemented in any other health system that utilizes an integrated EMR, providing similar benefit to an at-risk patient demographic, with a common clinical problem that is habitually neglected or undertreated.

Disclosures No relevant conflicts of interest to declare.

Table 1. Hemoglobin change by timing of infusion

Hemoglobin at:	Time of referral		Presentation for delivery		Post-partum period	
	Average Hb	*Hb<10*	*Average Hb*	*Hb<10*	*Average Hb*	*Hb<10*
Referred 1st/2nd trimester	8.96	31/34 (91%)	10.81	8/34 (24%)	11.74	0/34 (0%)
Received infusion	*8.95*	*25/27 (93%)*	*11.05*	*5/27 (19%)*	*11.69*	*0/27 (0%)*
Did not receive infusion	*9.01*	*6/7 (86%)*	*9.89*	*3/7 (43%)*	*12.3*	*0/7 (0%)*
Referred 3rd trimester	9.25	155/186 (83%)	10.37	77/186 (41%)	11.65	8/64 (13%)
Received infusion	*8.98*	*104/111 (94%)*	*10.48*	*41/111 (37%)*	*11.63*	*4/36 (11%)*
Did not receive infusion	*9.64*	*51/75 (68%)*	*10.21*	*36/75 (48%)*	*11.67*	*4/28 (14%)*
All	9.2	186/220 (85%)	10.44	85/220 (39%)	11.66	8/77 (10%)
Received infusion	*8.97*	*129/138 (93%)*	*10.59*	*46/138 (33%)*	*11.64*	*4/48 (8%)*
Did not receive infusion	*9.59*	*57/82 (70%)*	*10.18*	*39/82 (48%)*	*11.69*	*4/29 (14%)*

Interval between infusion and delivery	<2 weeks	2-4 weeks	4-6 weeks	>6 weeks	**All**
Average change in Hb	0.84	1.34	2.05	2.37	1.66
Range	(-0.3 - 2.5)	(-0.6 - 3.7)	(0.1 - 4.6)	(-0.7 - 5.5)	(-0.7 - 5.5)
Average Hb at time of presentation for delivery	9.8	10.4	10.9	11.3	10.6

Table 2. Characteristics of patients requiring peripartum transfusion

Received transfusion	Number of patients	Average Hb at time of presentation for delivery	Average estimated blood loss (cc)	Delivery by Cesarean Section
Yes	27	10.05	1194	18 (67%)
No	194	10.46	458	65 (33%)
Total	**221**	**10.41**	**550**	**83 (38%)**

Figure 1

https://doi.org/10.1182/blood-2023-188314