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POSTER ABSTRACTS

102.IRON HOMEOSTASIS AND BIOLOGY

Ironing out the Wrinkles: Low Molecular Weight Iron Dextran and Premedications

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Intravenous (IV) iron infusion increases hemoglobin levels and reduces the need for transfusions compared to oral iron in patients with iron deficiency. Low molecular weight iron dextran (LMW ID) has a boxed warning for anaphylactic-type infusion reactions and premedication is commonly given. However, a recent multi-institution cohort study showed similar rates of infusion-related adverse events (AEs) with iron sucrose (4.3%) and iron dextran (3.8%), and a 23-fold higher incidence of AEs among those who received premedication compared with those who did not (38.6% vs 1.7%).

There is currently a national shortage of iron dextran. A study during a previous iron dextran shortage in 2016 showed that the increased use of newer IV iron formulations persisted even once the shortage ended. This may in part be due to the concern for infusion reactions, but the use of these formulations comes at a significant cost. An analysis of the US FDA database showed that, based on differences in the average price of iron sucrose and LMW ID, the cost to prevent one life-threatening AE related to the use of LMW ID was estimated to be 5.0-7.8 million dollars. The cost to prevent one LMW ID-related death was estimated to be 33 million dollars.

To further evaluate the incidence of infusion reactions and the use of premedication at the University of Kansas Medical Center, we performed a retrospective analysis of all patients who received their first ever infusion of iron dextran between 1/1/2021-12/31/2022. Infusion reactions were characterized as severe if hypoxia (O2<90%), hypotension (<100/80) or hospital admission occurred. Ninety-six patients were identified. 17 (17.7%) were males and 79 (82.3%) were females. There were 49 (51%) Caucasian, 26 (27.1%) African Americans, 12 (12.5%) Hispanic, and 9 (9.4%) others. 8 patients had infusion reaction (8.3%; 95% CI 4.0-15.1%) as determined by review of nursing documentation. Serious infusion reactions with LMW ID were rare (n=2, 2.1%), and neither patient required epinephrine administration nor hospitalization.

Patients with history of allergies (n=61, 63.5%) had a higher incidence of AEs compared to those who did not (13.1% [95% CI, 6.4-23.2%] vs 0.0%, P = 0.022). This was even higher in 27 (28.1%) patients with 3 or more allergies (18.5% [95% CI, 7.4-35.9%] vs 0.0%, P = 0.019). In 71 (80.2%) patients who received premedication, there was a lower incidence of AEs compared to those who did not (3.9% vs 26.3%; $\chi 2 = 10.02$; P =0.007). The incidence of AEs was compared with individual premedication, and lower incidences were seen in 64 (66.7%) patients with diphenhydramine (3.1% vs 18.8%, $\chi 2 = 6.82$; P =0.015), 50 (52.1%) with methylprednisolone (2.0% vs 15.2%, $\chi 2 = 5.48$; P =0.022), and 46 (47.9%) with acetaminophen (0.0% vs 16%, $\chi 2 = 8.03$; P =0.004).

Notably, a variety of premedication combinations and doses were used, indicating a lack of standardization even within a single institution. No patient who received acetaminophen experienced an infusion reaction. By contrast, there was no significant difference in patients receiving famotidine, suggesting that while acetaminophen may be a useful premedication, famotidine may not be beneficial. Further, our data strongly suggests that patients without a history of drug allergies do not require premedication.

Our retrospective study demonstrates significant benefit to receiving premedication, which is divergent when compared to previous studies. This may be due to several reasons: the previously mentioned multi-center study included multiple formulations of IV iron, had a much lower rate of premedication (6% vs. 80%), and used a different definition of infusion reaction.

In the multi-center cohort study, administration of medications post-iron infusion was used as a surrogate marker of reaction, while in our study it was based on review of nursing documentation. Both our study and the prior multi-center study noted an increased incidence of infusion reactions in patients with a history of allergies, and both demonstrated the rarity of serious reactions.

Based on these results and the prior studies indicating the increased cost of other IV iron formulations, consideration of reinstitution of LMW ID with de-escalation of premedication in those without history of drug allergies should be considered once the current drug shortage resolves.

Disclosures No relevant conflicts of interest to declare.

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