PERINATAL JOURNAL

Original Article

Perinatal Journal 2025;33(1):25-27

Effect of oral supplementation with micronized ferric pyrophosphate in pregnant women to prevent postpartum hemorrhage

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Abstract

Objective: The aim of this study was to evaluate the impact of oral supplementation with micronized ferric pyrophosphate in pregnant women to prevent postpartum hemorrhage

Methods: This was an observational retrospective study using data from clinical records of women with anemia who had visits at our private setting center. In this study, women who received oral supplementation with oral Sunactive Fe Pyrophosphate plus Vitamin C, Folate, and Vitamin B12 daily as prophylactic treatment for iron deficiency anemia were compared with women who did not. The intervention group received the supplementation starting from the diagnosis of anemia until the day of delivery. The control group received standard care, i.e. ferrous sulphate (daily 80 mg Fe+2), starting from the diagnosis of anemia until the day of delivery.

Results: PPH occurred in 11/250 women in the intervention group and 19/250 in the control group (4.4% vs 7.6%; p value = non significant). Supplementation with Sunactive Fe PPyrophosphate was associated with significantly higher ferritin level at the time of delivery, higher Hb level at the time of delivery and one month after delivery, and lower gastrointestinal side effects.

Conclusion: Our study provides newer evidence that demonstrates the effectiveness of Sunactive iron, with fewer side effects, in pregnant women with mild anemia. Larger randomized trials are required to confirm our data.

Keywords: Infertility, supplement

Introduction

In pregnant women anemia is defined as hemoglobin (Hgb) level below 11 g/dL in the first trimester, or below 10.5 g/dL in the second trimester, or below 11 g/dL in the third trimester.[1] Anemia may be acquired, such as deficiency anemia (e.g. irson, vitamin B12, folate), hemorrhagic anemia, anemia of chronic disease, aplastic anemia, or inherited, such as thalassemia, sickle cell anemia, or hemoglobinopathies other than sickle cell anemia.

Iron deficiency anemia is extremely common during pregnancy. It is an acquired anemia characterized by increased red blood cell production with mean corpuscular volume (MCV) less than 80 fL (microcytic anemia).[1] A national study of anemia in pregnancy found a prevalence of 22 per 1,000 pregnant women in the United States.[2]

Oral iron supplementation is the gold standard approach for iron deficiency anemia in pregnancy.[1] Different iron supplements are available on the market.[3] They include ferrous fumarate, ferrous sulfate, ferrous gluconate, iron dextran, ferric gluconate, and iron sucrose.[1,3] Micronized Ferric Pyrophosphate (SunActive®Fe) has been associated with better tolerability and effectiveness compared to oral ferrous sulfate in several studies.[4-6]

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How to cite this article: Napoli FD, Vigilante L, Trinchilllo MG, Esposito G, Turco M, Gragnano E, Colacurci D, Saccone G. Effect of oral supplementation with micronized ferric pyrophosphate in pregnant women to prevent postpartum hemorrhage. Perinatal Journal 2025;33(1):25-27 DOI: 10.59215/prn.24.0323005

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Objective

The aim of this study was to evaluate the impact of oral supplementation with micronized ferric pyrophosphate in pregnant women to prevent postpartum hemorrhage.

Methods

This was an observational retrospective study using data from clinical records of women with anemia who had visits at our private setting center. Data were collected in a dedicated encrypted database and anonymized.

In this study, women who received oral supplementation with oral Micronized Ferric Phyrophosphate (SunActive Fe), coated with monoglycerides and diglycerides to minimize particle aggregation, plus Vitamin C, Folate, Copper and Vitamin B12 (Emefer) daily as prophylactic treatment for iron deficiency anemia were compared with women who did not. The intervention group received Emefer cpr (SunActive Fe 30 mg, Vitamin C 100 mg, Copper 1,50 mg, Folate 400 mcg, and Vitamin B12 2,75 mcg). The intervention group received the supplementation starting from the diagnosis of anemia until the day of delivery. The control group received standard care, i.e. ferrous sulphate (daily 80 mg Fe+2), starting from the diagnosis of anemia until the day of delivery.

Inclusion criteria were singleton gestations with microcytic mild iron deficiency anemia. Mild anemia was defined as Hgb level between 9.00 and 10.99 g/dL. Exclusion criteria were multiple gestations, and moderate or severe anemia defined as Hgb level below 9.00 g/dL.

The primary outcome of the study was the incidence of postpartum hemorrhage (PPH). The secondary outcomes were rise in serum ferritin, rise in Hgb level and maternal tolerability.

Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) v. 19.0 (IBM Inc., Armonk, NY, USA). Data were shown as means± standard deviation or as number (percentage). Dichotomous data were compared using the chi-square. Comparisons between groups were performed with the use of the T-test to test group means by assuming equal within-group variances. A sample size of 500 women was planned.

Results

500 women were included in the study. 250 received the intervention, and 250 were included in a control group matched for demographics. No significant differences were found in baseline characteristics, shown in Table 1. The mean BMI was 23.4 in the intervention group, and 21.8 in the control group. 4 women in the intervention group had prior PPH in a prior pregnancy, and 7 in the control group.

Primary and secondary outcomes were show in Table 2. PPH occurred in 11/250 women in the intervention group and 19/250 in the control group (4.4% vs 7.6%; p value = non significant). Supplementation with Micronized Ferric Pyrophosphate was associated with significantly higher ferritin level at the time of delivery, higher Hb level at the time of delivery and one month after delivery, and lower gastrointestinal side effects (Table 2).

Table 1. Maternal characteristics

	Intervention group N = 250	Control group N = 250	p-value
BMI	23.4±7.8	21.8±6.2	NS
Smoking	21 (8.4%)	29 (11.6%)	NS
Prior PPH	4 (1.6%)	7 (2.8%)	NS
Nulliparous	190 (76.0%)	178 (71.2%)	NS

NS, non significant; PPH, post partum hemorrhage

Table 2. Primary and secondary outcomes

	Intervention group N = 250	Control group N = 250	p-value
PPH	11 (4.4%)	19 (7.6%)	NS
Ferritin level the day of delivery (micrograms per liter)	19±3.2	8.4±4.6	<0.05
Hb level the day of delivery (g/dl)	11.4±2.3	10.2±2.5	<0.05
Hb drop 24h after delivery (g/dl)	1.8±0.9	1.7±1.1	NS
Hb level one month after delivery (g/dl)	13.4±4.2	11.8±3.5	<0.05
Nausea	20 (8%)	98 (39.2%)	<0.05
Diarrhoea	29 (11.6%)	69 (27.6%)	<0.05
Black or tarry stools	32 (12.8%)	103 (41.2%)	<0.05

NS, non significant; PPH, post partum hemorrhage; Hb, hemoglobin

Discussion

This study found that the use of Micronized Ferric Pyrophosphate compared to standard ferrous sulphate, in pregnant women with mild anemia, is associated with increase hb level and trend for benefit in reduction of PPH.

Iron deficiency and iron anemia are highly prevalent and are the most common cause of anemia in pregnant women.[7-11] Both iron deficiency and iron deficiency anemia represent significant health problems in pregnant

women. Anemia may lead to prolonged length of stay in the hospital in the postpartum period, impaired quality of life, and depression. In addition it has other manifestations, including tiredness, and hair loss.

Gold standard treatment is oral iron supplementation, especially ferrous sulfate.[12] However, it is associated with gastrointestinal side effects.[13] Intravenous iron administration is more costly [14], and may cause hypersensitivity reactions.[13]

Sunactive Fe is a micronized FePP coated with monoglicerydes and diglicerydes to minimize particle aggregation.[16-18] These properties result in higher absorption and gastrointestinal tolerance. The absorption of Micronized iron is indeed mostly hepcidin-independent, and preliminary data suggested efficacy in treatment iron deficiency anemia.[19]

Conclusion

Our study provides newer evidence that demonstrates the effectiveness of SunActive Fe, with fewer side effects, in pregnant women with mild anemia. Larger randomized trial are required to confirm our data.

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