



Prescribing pattern of iron preparations in antenatal women in a tertiary care hospital

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Abstract:

Iron deficiency anemia in pregnant women is a major health problem in India. According to WHO, anemia in pregnant women is described as Hb% <11g/dl or hematocrit <33% and all pregnant women are to be given a standard dose of 60mg and 120mg elemental iron for prophylaxis and treatment of anemia respectively. As per ICMR guidelines, the dosage has increased from 60 to 100mg for treatment of anemia. This study was done to study the prescribing pattern of iron preparations in antenatal women and to compare the elemental iron content in the drug. Fifty pregnant women were included in the study. Prescription analysis showed that 94% were given oral iron preparations and 6% were given I.V. injections. The commonly prescribed drugs were Ferrous Ascorbate(42%) and Sodium Feredetate(40%) containing elemental iron 100mg and 33mg respectively. The I.V. preparation used was mainly iron sucrose (6%). Since both the oral iron preparations were prescribed once daily, Ferrous Ascorbate should be preferred over Sodium Feredetate since the total elemental iron in Sodium Feredetate is not sufficient as per WHO and ICMR guidelines.

Key words: antenatal women, haemoglobin, elemental iron

Introduction:

Pregnancy is a physiological process. This period is important for both mother and child.^{1,2} Medicines are used during pregnancy for preventive, promotive and curative purposes.³ Careful consideration of the benefit to the mother and the risk to the fetus is required while prescribing drugs during pregnancy. Reducing medication errors and improving patient safety are the important areas of discussion.⁴ During pregnancy, iron deficiency is associated with multiple adverse outcomes for both mother and infant, including an increased risk of haemorrhage, sepsis, maternal mortality, perinatal mortality, and low birth weight.⁵ Iron deficiency affects a significant part, and often a majority of the population in nearly every country in the world.⁶ According to WHO, iron deficiency anaemia in pregnant women is defined as Hb% <11gm/dl or hematocrit <33%.⁶ Iron

need increases most during the second half of the pregnancy and especially during the last trimester.⁷ The average woman of reproductive-age needs about 350-500 mg additional iron to maintain iron balance during pregnancy. Potentially, this iron could be provided either from the mother's iron stores or from iron supplements. However, the mean iron content of the body reserves - ferritin and haemosiderin is often only around 200-250 mg.^{8,9} As per WHO standards, all pregnant women should be given a standard dose of 60 mg iron + 400 µg folic acid daily for 6 months as prophylaxis & anaemia should be treated with doses of 120 mg iron daily for three months.^{10,11} As per ICMR guidelines too, the dosage of iron was increased from 60 to 100 mg in 1992.¹²

This study was done to study the prescription pattern of iron preparations in women attending the antenatal clinic of Obstetrics and Gynaecology department at

a tertiary care hospital and to compare the elemental iron content in the drugs prescribed.

Materials and methods:

This prospective study conducted on 50 antenatal women to know the prescribing patterns of iron preparations, in the outpatient department of Obstetrics and Gynaecology, at RajaRajeswari Medical College & Hospital. This research was undertaken after the approval from Institutional Ethics Committee. Data was collected from the outpatient cards of pregnant women visiting Obstetrics and Gynaecology OPDs in the proformas designed for the study purpose.

The prescribing pattern of iron preparations was analysed in relation to the haemoglobin levels of pregnant women and the elemental iron content of the medication.

Inclusion criteria:

All pregnant women visiting antenatal OPDs in 2nd and 3rd trimester.

Pregnant women with Hb% levels less than 11gm%.

Exclusion criteria:

Pregnant women having any allergy to iron, malabsorption syndrome & thalassemy.

Statistical analysis

Data collected were analysed using descriptive statistics and results are depicted in the form of percentage and pie charts.

Results:

Out of 50 pregnant women, 30% were in 2nd trimester & 70% were in 3rd trimester. Based on their haemoglobin percentage,

10% (n=5) women had Hb% less than 8.5gm% and 90% (n=45) in the range of 8.5-11gm%. Prescription analysis showed that 94% (n=47) were given oral preparations & 6% (n=3) were given I.V. injections (when Hb% was < 8.5gm%) (Table I).

Calculation of elemental iron content:

Ferrous ascorbate:

- Molecular weight (M.W.) of ferrous ascorbate = 408g
 - Atomic weight of Iron = 55.845g
 - 408g contains 55.845g of iron
- $$100\text{g contains} = (100 \times 55.845) / 408$$

$$\text{Elemental Iron} = 13.7\%$$

Ferrous fumarate:

Similarly, M.W. of Ferrous fumarate is 169.9g

Hence Elemental Iron % is **33%**.

Sodium ferredetate:

- Molecular weight of sodium ferredetate = 421g
- Atomic weight of Iron=55.845g
- 421g contains 55.845g of iron
- 100g contains = $(100 \times 55.845) / 421$

$$\text{Elemental Iron} = 15\%$$

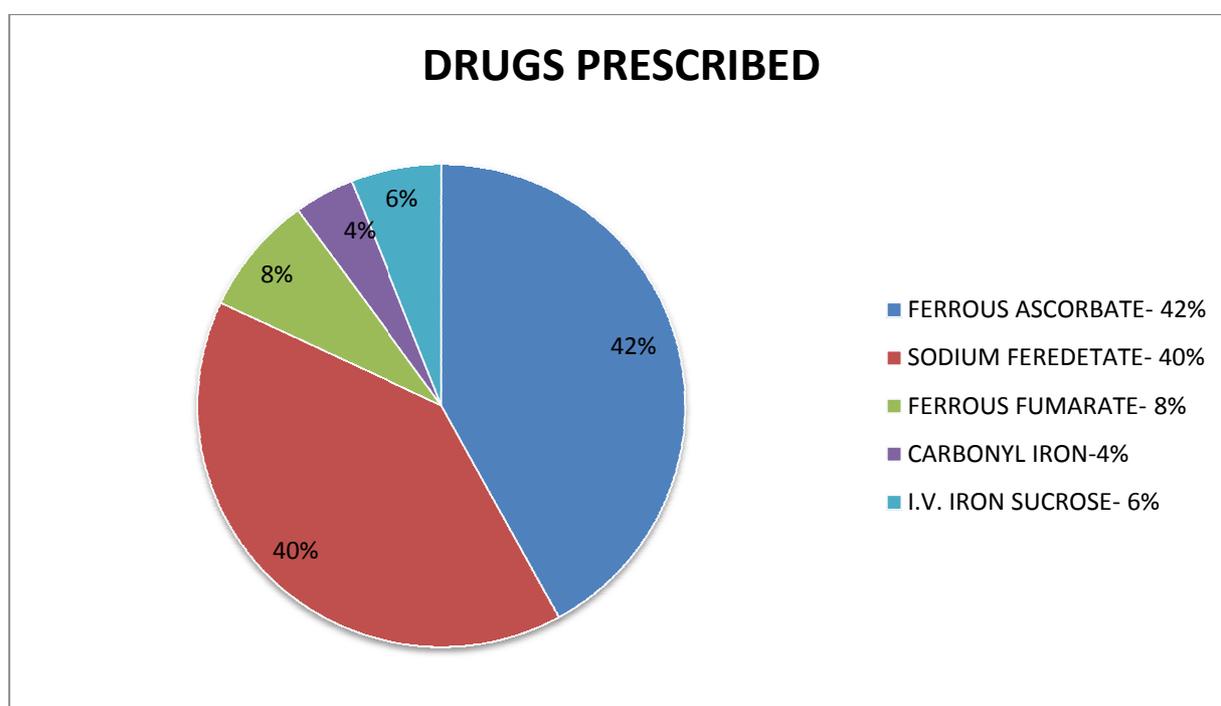
Carbonyl iron:

M.W. of Carbonyl iron is 195.9g

Hence, Elemental Iron % is **28.5%**.

Table I: Elemental Iron in iron preparations prescribed

| Sl. No. | Iron Preparations | n (%) | Elemental Iron(%) | Total elemental iron/ dose |
|---------|-------------------|----------|--------------------|----------------------------|
| 1. | Ferrous ascorbate | 21 (42%) | 13.7% | 100mg |
| 2. | Sodium feredetate | 20 (40%) | 15% | 33mg |
| 3. | Ferrous fumarate | 4 (8%) | 33% | 20mg |
| 4. | Carbonyl iron | 2 (4%) | 28.5% | 50mg |
| 5. | I.V. Iron sucrose | 3 (6%) | | 20mg/ml |

Image I: The prescribing pattern of iron preparations

Discussion:

As we know, iron deficiency anaemia is very common worldwide. In India, prevalence of anaemia in pregnancy is high. Pregnancy with anaemia has a significant impact on the health of fetus as well as that of the mother. The treatment of iron deficiency anaemia is given to replenish Hb and restore iron stores by supplying sufficient iron. The purpose of this study was to assess the preparations for iron supplementation during pregnancy in terms of frequency of use and their elemental iron content. Ferrous Ascorbate was the most commonly prescribed iron preparation (42%) followed by Sodium Ferredetate (40%). Ferrous Ascorbate provides 100mg of elemental iron/dose, hence it should be preferred over Sodium Ferredetate which provides only 33mg/dose of elemental iron which is not sufficient as per WHO & ICMR guidelines. Therefore, the dose of Sodium Ferredetate should have been increased proportionately, to provide required elemental iron.

Carbonyl Iron (4%) which provides 50mg elemental iron is given twice daily, which makes 100mg/day and is in correlation with the guidelines. Ferrous fumarate (8%) provides 20 mg/day, which is not sufficient & hence dose should be increased. Intravenous Iron sucrose (6%) having 20mg/ml provided 100mg (5ml) of elemental iron per day. In our present study, only 2 days treatment was possible as the pregnant women came just before delivery.

Conclusions:

Iron preparations which provide more elemental iron per dose should be preferred. Along with elemental iron content, the side effects of the drugs like nausea, vomiting, abdominal pain should also be kept in mind while prescribing the drug. Pregnant women should also be advised to take food rich in iron along with

ascorbic acid needed for the absorption of iron. In this study, the iron preparations prescribed are as per the guidelines except sodium Ferredetate. All these measures reduce the risk of iron deficiency anaemia, which is highly prevalent in pregnant women.

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